

Cardinality and (In)definiteness

Introduction In every language, numeral constructions (NCs) can freely receive indefinite interpretations. This is even the case in languages that strictly disallow bare nouns in argument positions, like French (Chierchia 1998). NCs can also co-occur with the definite article in languages like English and French, but they typically require demonstratives to convey definite-like readings in articleless languages such as Mandarin and Russian (Jiang 2012). The resistance of NCs to definiteness in articleless languages is particularly puzzling because bare nouns freely allow definite interpretations in these languages (Chierchia 1998, Dayal 2004). Our study links this general indefinite characteristics of NCs to the projection of a cardinal head that may surface covertly and/or overtly, through an analysis of NCs in Turkish, an articleless optional classifier language.

Background Languages like English that distinguish between the unmarked and plural form of nouns also reflect this in their NCs. Languages like Mandarin, which lack a systematic number marking system, use the unmarked form in NCs but require a classifier, regardless whether the noun is ontologically count or mass. In English only mass nouns are incapable of directly combining with a numeral, modulo packaging coercion. This disparity has led to the view that all nouns are mass or mass-like in Mandarin-like languages, requiring some sort of fixing via classifiers to make counting possible with them (e.g., Krifka 1995, Chierchia 1998, Borer 2005).

Puzzle Turkish is like English in having a systematic number marking mechanism but NCs use the unmarked form with all numerals, also featuring an optional classifier, *tane* (5a). Both numerals and *tane* are selective for the count sense of the noun, while mass nouns obligate a mediator for counting (5b) & (5c). Crucial for our purposes, *tane* may seem optional syntactically, but the two forms of NCs vary in their interpretation: Both forms can be indefinite and hence yield exceptional and intermediate scope readings but NCs without *tane* can also be definite [See (6) & (7)]. More precisely, while NCs with *tane* are restricted to indefiniteness, as typical for NCs cross-linguistically, NCs without *tane* draw away from the ordinary picture in also allowing definiteness. The challenges these variations introduce are twofold: (i) how the counting system works in Turkish and what role *tane* plays in this, (ii) how the presence/absence of *tane* affects interpretation, contributing to the exceptional status of the Turkish counting system.

The Cardinal Head Considering that *tane* is selective for count nouns only, we analyze it as a separate category from obligatory classifiers. We follow Scontras (2014) in that NCs universally bear a cardinal head (CARD) that denotes a counting function. We propose that while CARD is typically only realized covertly as in English, the Turkish CARD can also be realized overtly as *tane*. We assume that CARD is a separate covert head above the classifier projection in Mandarin-like languages. Sağ (2018) shows that Turkish unmarked nouns are ambiguous in denoting atomic properties and singular kinds like English unmarked nouns due to Dayal 2004 (also Martí 2020). Since singular kind reference is opaque to instantiation (Dayal 2004), Sağ, following Ionin & Matushansy (2006: I&M), argues that counting requires atomic properties in Turkish whether *tane* is present or not. In I&M’s view, this requirement is fulfilled by morphologically unmarked nouns in languages like Turkish, while English NCs further involve plural agreement. Based on these views, we take CARD to uniformly presuppose a semantically singular form of the noun:

- (1) $\llbracket \text{CARD} \rrbracket = \lambda P \lambda n \lambda x: \forall y [P(y) \rightarrow AT(y)]. \exists S [\prod(S)(x) \wedge |S| = n \wedge \forall s [s \in S \rightarrow P(s)]]$
 $\prod(S)(x) = 1$ iff S is a cover of x , and $\forall z, y \in S [z = y \vee \neg \exists a [a \leq_i z \wedge a \leq_i y]]$

A set of individuals C is a cover of an individual X iff X is the sum of all members of C .

Indefiniteness To understand the inherent indefiniteness of NCs, let us consider the interpretation

of bare arguments. In the neo-Carlsonian approach, bare nouns in articleless languages can be definite via covert ι type-shifting, which is unavailable in languages with a definite article due to the Blocking Principle; it requires the use of lexical items instead of covert type-shifters (Chierchia 1998). That NCs cannot convey definiteness without demonstratives in articleless languages shows that ι type-shifting is not available for NCs, contrasting with bare nouns. In short, while indefiniteness is the default interpretation for NCs, definiteness is only available for them through overt marking. Jiang (2012) dedicates the source of indefiniteness to a lexical variant of numerals that has a built-in choice function variable (Reinhart 1997). Considering the facts of Turkish NCs, we propose that this source is rather linked to CARD: it has two variants, one that creates predicative NCs (1) and one that results in argumental NCs (2). In Reinhart’s theory, the \exists -closure of f applies at any compositional level, deriving the exceptional and intermediate scope readings of indefinites.

$$(2) \quad \llbracket \text{CARD}_f \rrbracket = \lambda P_{AT} \lambda n. f(\lambda x \exists S [\prod (S)(x) \wedge |S| = n \wedge \forall s [s \in S \rightarrow P(s)]])$$

The predicative value of NCs is only available for overt determiners in the argument position but barred from covert type-shifting, particularly via ι . We argue that if a maximal projection has a predicative value (type $\langle e, t \rangle$) and an argumental value (type e), an argumental type-shifter cannot apply to its predicative value due to a principle that we call *Shifting Economy* (Dayal 2013):

(3) *SHIFT(XP) if the XP has inherently an argumental meaning.

This restricts NCs to indefiniteness favoring the use of CARD_f over the ι type-shift of NCs with the predicative value of CARD. NCs then gain definite-like readings in articleless languages only via overt means like demonstratives that take the predicative CARD as their restrictor. (3) also captures the unavailability of ι type-shifting with NCs in languages with an overt definite article without resorting to the Blocking Principle. Given that argumental type-shifting of any sort is blocked by the inherent argumental value of NCs, no competition arises with the definite article. [See (9).]

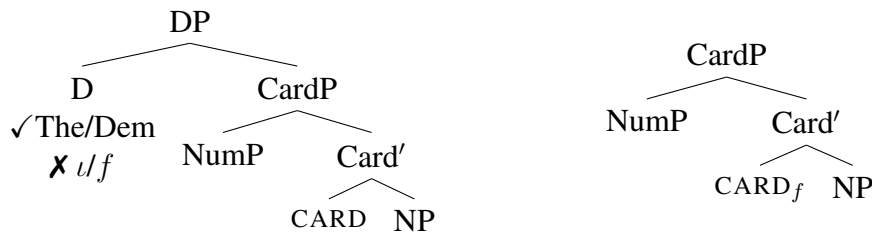
Back to Turkish We propose that in articleless languages that have an overt and a covert form of CARD, the restriction of NCs to indefiniteness can be lifted by liberating one form from the argumental value. NCs with the liberated form are enriched in meaning since they are not subject to the Shifting Economy; they can feed into covert type-shifting operators, including ι and the choice function, and allow both definite and indefinite interpretations. In Turkish, the form that is lexically ambiguous and hence associated with f is the overt CARD, i.e., *tane*, while the covert CARD is disambiguated and has only the predicative value (4). As a result, while NCs with *tane* are just like NCs in other languages reflecting the inherent indefiniteness, NCs with CARD_\emptyset bring a seemingly exceptional status to Turkish NCs. [See (10).]

$$(4) \quad \llbracket \textit{tane} \rrbracket = (1): \text{predicative}, \llbracket \textit{tane}_f \rrbracket = (2): \text{argumental vs. } \llbracket \text{CARD}_\emptyset \rrbracket = (1): \text{predicative only}$$

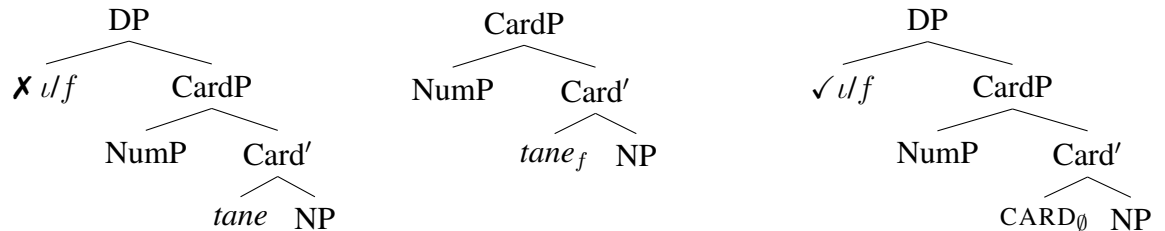
Discussion It is worth highlighting that there is no escape from the predicative variant of *tane*. Both forms of Turkish NCs can occur with demonstratives and determiners like *her* ‘every’ and occupy the predicate position, as in other languages. Particularly, NCs with *tane* can occur with \exists -determiners like *en az* ‘at least’ (8), in which case the \exists -DP does not have an exceptional scope reading. This shows that NCs with *tane* cannot be associated with f in such cases and therefore must have a predicative value independently of the argumental one. Finally, while the liberated form is the covert CARD in Turkish, this is a language-specific choice. To create a comparative platform, we investigated NCs in another articleless optional classifier language, i.e., Farsi, and found that it is NCs with the classifier that allow definite and indefinite readings, while the classifierless form is only indefinite. To conclude, our study contributes to the cross-linguistic semantics of NCs by bringing novel data from Turkish, and relates the indefiniteness of NCs with cardinality.

- (5) a. iki (tane) kitap(*-lar) b. iki (tane) su c. iki *(damla) su
 two CL book-PL two CL water two drop water
 ‘two books’ ‘two waters (in containers)’ ‘two drops of water’
- (6) Polis **iki (tane) hemşire**-nin ölüm-ü-nü araştır-ıyor. **İki (#tane)**
 police two CL female.nurse-GEN death-3POSS-ACC investigate-PROG two CL
kadın-ın ellili yaş-lar-da ol-duğ-u tahmin ed-il-iyor.
 woman-GEN fifties age-PL-LOC be-NMLZ-3POSS predict-PASS-PROG
 ‘The police are investigating the death of two nurses. It is predicted that the two women were in their fifties.’
- (7) a. Eğer **iki (tane) proje**-m seçil-ir-se, ödenek al-abil-eceğ-im.
 if two cl project-1sgposs select-pass-aor-cond, funding take-abil-fut-1sg
 ‘If two of my projects (collectively) are selected, I will receive funding.’
 (if > two, two > if)
- b. Çoğu dilbilimci **iki (tane) soru**-ya yanıt ver-en her öğrenci-ye A ver-di.
 most linguist two CL question-DAT answer-REL every student-DAT A givePAST
 ‘Most linguists gave an A to every student that answered two questions.’
 (Linguist 1 gave an A to every student who answered Question a and b. Linguist 2 gave an A to every student who answered Question c and d, etc.)
- (8) Eğer **en az üç (tane) proje**-m seçilirse, ödenek al-abil-eceğ-im.
 if at least three CL project-my if.selected funding take-ABIL-FUT-1SG
 ‘If at least three of my projects are selected, I will receive funding.’ (if > **three**, #**three** > if)

- (9) a. Generalized structure of NCs with CARD b. Generalized structure of NCs with CARD_f



- (10) a. NCs with *tane* b. NCs with *tane_f* c. NCs with CARD_∅



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