

Determination and modification: interaction and interpretation*

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1 Introduction

We aim to present an analysis of what Ionin and Matushansky (2004) call the MODIFIED CARDINAL CONSTRUCTION, illustrated in 1:

- (1) a. *An astonishing 6400 replies* were received.
- b. At minimum level, the Hold period is 20ms; at maximum it is *a whopping four seconds*.
- c. *A scant 100 years* before there had been none of these things, and the world was powered by horses and lit by candles.
- d. We are down to *a lucky three finalists*.¹
- e. They provided *a generous five examples of the construction*.

Interesting properties of this construction:

- the singular determiner *a* is grammatical despite the noun being plural
- both the determiner and adjective are obligatory (**a 6400 replies*, **There were astonishing 6400 replies*)

The goal of our presentation: show that this construction offers support for Kim's (2003) claim that there are two types of agreement in English, but undermines the details of his particular analysis.

The structure of this presentation:

- Introduce Kim's (2003) analysis of agreement.
- Provide a constructional analysis of the grammar of English number expressions
- Provide a constructional analysis of the modified cardinal construction
- Compare our analysis with that of Ionin and Matushansky (2004)

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¹This is semantically distinct in that *lucky* applies simply to *finalists*, not the quantity of finalists. For present purposes we ignore the distinction.

2 Laying the groundwork

2.1 English hybrid agreement

- Kim (2003) showed that it is necessary to treat determiner-noun agreement separately from subject-verb agreement in English. Det-noun agreement is purely morphosyntactic, while subject-verb agreement is sensitive to semantics.
- He models this in HPSG by positing two features to which agreement is sensitive: AGR and INDEX. Det-noun agreement is mediated by AGR, and subj-verb agreement is mediated by INDEX.

$$(2) \left[\begin{array}{l} \text{FORM} \quad \langle \text{GOVERNMENT} \rangle \\ \text{HEAD} \quad \left[\begin{array}{l} \textit{noun} \\ \text{AGR|NUM} \quad \textit{sg} \end{array} \right] \\ \text{CONT|INDEX|NUM} \quad \textit{pl} \end{array} \right]$$

2.2 Number expressions

As a preliminary to analyzing modified cardinals, we provide an outline of the syntax of cardinal numbers: (for much of this we follow the descriptive generalizations of Pullum and Huddleston (2002)).

- Simple numbers: one, seven, eighty-seven (all numbers <100, excluding *dozen*)
- Dependent numbers: dozen, hundred, thousand, million
- Complex number (expressions): one million, four hundred, three thousand forty-five

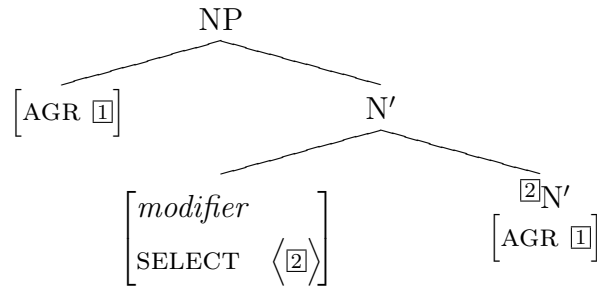
Complex numbers have a multiplier (***four hundred***) and may have an addition (*four hundred (and) fifty*).

Simple numbers and complex numbers have essentially the same status.

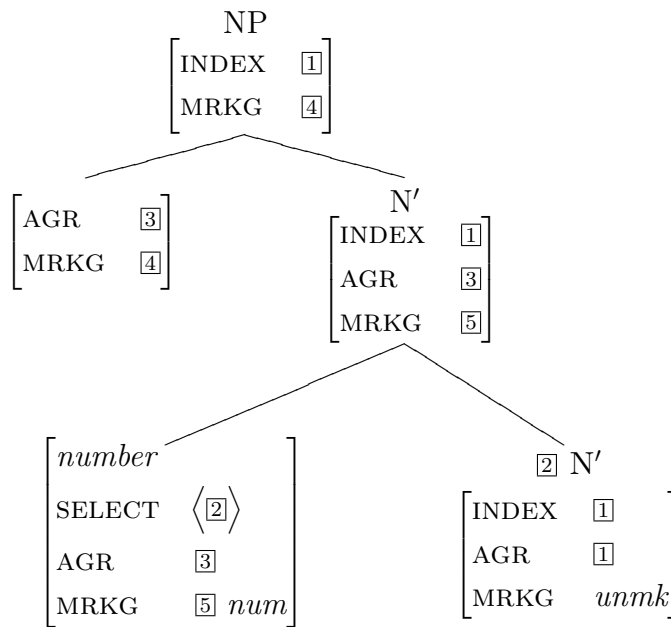
- They require and project plural nominal structures. *those/#that three hundred people/*person*
- They allow “N’ ellipsis” (i.e., can stand alone as an NP). *There were three (hundred).*

Dependent numbers, unlike simple numbers cannot combine with a nominal to project an NP: they are generally be constructionally combined to create a complex number (*three hundred*), or within a determined NP (see (4b, 4c)). As always, determiners may not iterate.

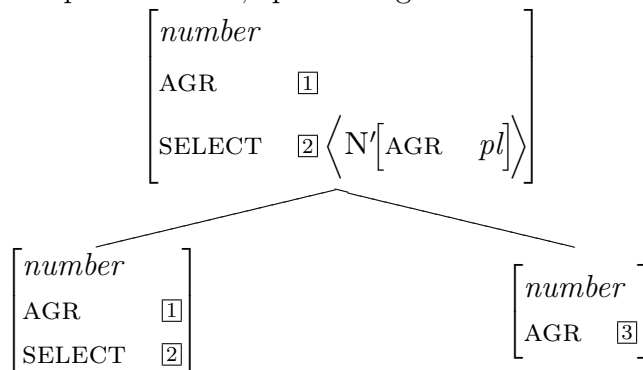
- (3) a. Three thousand admirals participated.
 - b. A thousand admirals participated.
 - c. The thousand admirals who participated were....
 - d. *The a thousand / A the thousand...
- (4) a. Normal Modifier



- b. Numbers

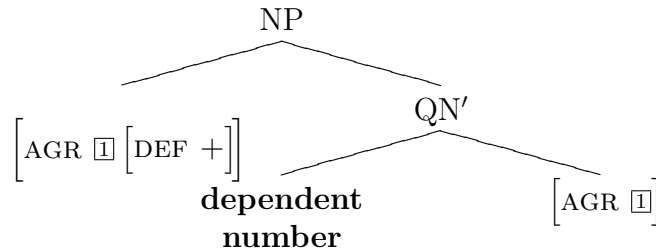


- c. Complex Number; specifier agreement comes from the left daughter

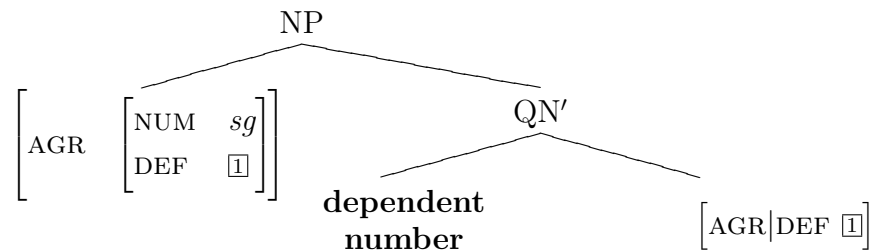


We capture the behavior of dependent numbers with these two constructions (AGR indicates agreement features, including number and definiteness, which must be unified with those of the specifier (the determiner, for all purposes herein)).^{2,3}

- (5) a. The/those hundred people



- b. a/the/this hundred people



- If the NP is definite, the dependent number is “transparent” to definiteness, number and all other spec-head agreement features on the head noun, allowing *these hundred people*.
- Otherwise, the dependent number specifies that the NP it is in will have a singular determiner (allowing for *a*), despite whatever number specification is on the head noun.

Focusing in on the determiner *a*: it is normally incompatible with simple and complex number expressions.

- (6) a. *a thirty admirals
 b. the/those/that nation’s thirty admirals
 c. *a two hundred power plants
 d. the/those/that nation’s two hundred power plants

- The construction in 5a requires a dependent number, ruling out 6a and 6c (which contain simple and complex numbers).

²QN' is shorthand for N'[MRKG num]. On the MRKG (MARKING) feature, see Van Eynde, 2007.

³We consider definiteness to be among relevant agreement features, though for English it may be sufficient for it to be solely semantic.

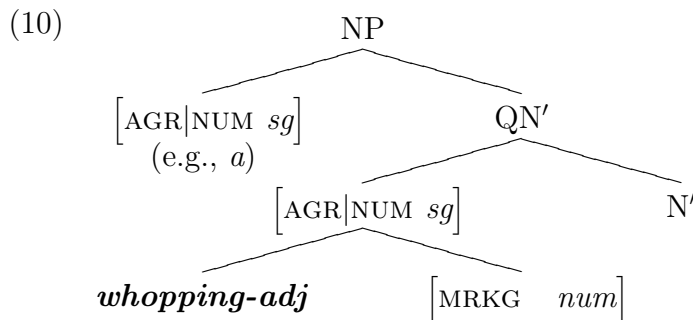
3 The modified cardinal construction

Consider now the phrases below, which seem to violate the constraint that *a* requires a dependent number.

- (7) a. an amazing/outstanding/whopping six/sixty/six hundred/hundred admirals
 b. [det] [AdjP] [number expression] [nominal]
- mere/scant/paltry/good/full/whole/generous
 - unprecedented/estimated/typical/reported
 - quick/busy/hectic
- (8) * a tall/smart/loud six/sixty/six hundred/hundred kids
 (9) a whopping {one/*a} thousand admirals

- With an intervening adjective, the NP may have a determiner *a* regardless of the number of the head noun → NP-internal agreement is not purely based on the morphosyntactic features of the determiner and head noun.
- More strikingly, any variety of number expression becomes possible.
- ...except for determined number expressions (as in 9). (Further evidence that despite any functional similarity between *a* and *one*, they are syntactically distinct).

Our proposed construction for this:



- The *whopping*-type adjective essentially specifies its own agreement value (singular), forcing the NP's determiner to agree with it. Whatever specifier the number or head noun might have expected is “swallowed up.” Note that because the adjective selects a *num*-marked, and not a *det*-marked, constituent, 9 is ruled out.⁴

⁴Here we ignore several important tasks, including the possibility of a coherent (semantic) specification of what type of adjectives are permitted, and the fact that while *the* is a possible determiner in this construction, *a* is far more common.

- The construction violates Kim’s (2003) claim that all agreement features are co-identified throughout the NP.
- It does, however, further confirm the need for semantic agreement between subject and verb: *a whopping twenty people are here*.

4 Modified cardinals without a construction?

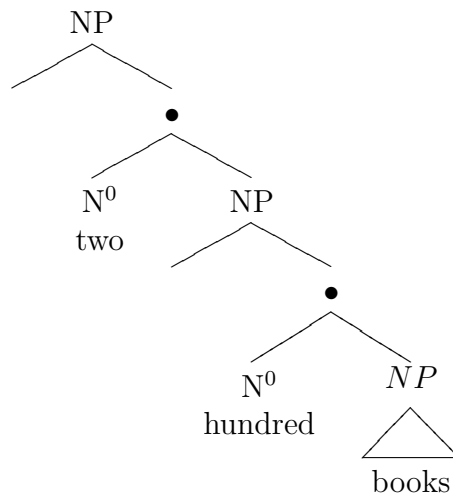
Ionin and Matushansky (2004) provide a rather different analysis of the English numeral system. They observe several phenomena in languages with a richer case and agreement system than English:

- Numerals are often morphosyntactically singular
- Numerals may govern the case and number of the nouns they quantify: in some cases they select (morphosyntactically singular) nouns.
- Simple numerals may independently govern the case of dependent numbers.

Ionin and Matushansky (2004) also attempt to give a unified denotation to simple numbers, whether used as a multiplier or not (e.g., *four* in both *four books* and *four hundred books*).

Given all this, they conclude:

- Numerals are heads of NPs, and select NPs:



- Numerals are always singular (morphosyntactically), and always select *semantically singular* nouns.
- NP-internal agreement must be done via “semantic concord”, separately from subject-verb agreement (cf. (Kim, 2003)).

Given all this, the modified cardinal construction is unsurprising: the presence of *a* is thus unsurprising: “the article agrees in number with the head of the xNP [extended NP], the cardinal N⁰, which is morphologically (and syntactically) singular” (Ionin & Matushansky, 2004:112).

However, two points work against this analysis.

1. They incorrectly predict *those hundred people* to be ungrammatical: if *a whopping hundred* is unexceptional, then how does an apparently plural determiner appear with a singular NP?
 - It may be that demonstrative determiners agree (morphologically) with the noun, while other determiners (*a/the*) agree with the numeral.
2. More significantly, they predict that “an amazing hundreds (of thousands) of cicadas” should be ungrammatical, because the head numeral (and noun) is plural, yet *a* is still licit.
 - On our analysis this is completely unproblematic: the construction already stipulates the possibility of a singular determiner, regardless the plurality of the numeral or its selectional properties (N-bar or PP), which are left untouched.

Finally, Ionin and Matushansky (2004) note several outstanding issues regarding their analysis (e.g., the ungrammaticality of **two four books*; these are already accounted for herein, as we make the (well-known) distinction between simple and dependent numerals, differentiating them in behavior via a differing specification for the AGR feature in their lexical entries.

5 Conclusions

- The modified cardinal construction provides further evidence for separating determiner-noun agreement from subject-verb agreement.
- It also, however, shows that agreement-related values cannot be completely identified throughout an NP.
- Determiner agreement is not always identical to agreement features of the noun head (*contra* Kim (2003) and Ionin and Matushansky (2004)).

References

Ionin, T., & Matushansky, O. (2004). A Singular Plural. In *Proceedings of WCCFL 23*.

- Kim, J.-B. (2003). Hybrid Agreement in English. In *Proceedings of the Fifth Annual Texas Linguistics Society*.
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A Unresolved issues

What remains unresolved in our approach is what connection may exist between (i) (ii) agreement facts of transparent group-nouns (11a), and (ii) the co-occurrence of determination and modification in this construction and in others (11b,11c).

- (11) a. A group of them are pictured in the ad as an uplifting rainbow coalition of smiling Americans.
- b. They are *(a) modern-day Romeo and Juliet.
- c. We encountered *(a) rather exhausted Chuck, coming back from his hike.

Although we have not fully explored the analyses of these cases, note that in each, AGR has unexpected properties reminiscent of the characteristics seen in the constructions explored here: In (11a), AGR has a number value (*sg*) different from that of INDEX (*pl*); in (11b) we have a singular number in AGR despite the conjunction “and” which normally builds an N’ with AGR set to plural, and in (11c) we see an AGR value [DEF –] just when a name is modified, while names normally set this feature to [DEF +] (additionally, marking is set to “unmarked” instead of “marked”). Interestingly, all of the cases seem semantically motivated by NP-internal duality. So, for example, in (11a), describing something as a group inherently requires two number values: that of the individuals making up the group and that of the number of groups. Whenever individuals are enumerated, a process that gestalts the individuals into a single group is available, and likely giving rise to the properties found by Ionin and Matushansky. The advantage of the analysis here is merely in showing how to capture an idiosyncratic language-specific set of facts demanding simultaneous access to the number features at both levels of conceptualization—group and distributed individuals—which must result from grammaticalization of these gestaltification patterns.