

## Adjectival Modification of Numerals

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We discuss the syntax and semantics of the English construction termed 'the modified cardinal construction' (Ionin and Matushansky 2004, 2016, henceforth I&M), or the 'Article+ Adjective+Numeral+Noun (AANN) construction' (Keenan 2013). Here is a typical example:

- (1) [A surprising seventy students] applied for this position.

An immediate peculiarity is the obligatory presence of the indefinite article, conditioned by the adjective and the numeral. Without them, the indefinite article is unacceptable:

- (2) a. \*Surprising seventy students applied for this position.  
b. \*a seventy students / \*a surprising students / \*a students

**Existing analyses** explain this pattern in different ways. For I&M (2004, 2016), the article surfaces for morphosyntactic reasons. Syntactically, the adjective modifies the numeral and the noun together (pace Jackendoff 1977): [a [surprising [seventy students]]].

In the absence of an adjective ('seventy students'),  $N^0$  and  $D^0$  are structurally adjacent, triggering m-merger (the collapse of two adjacent syntactic heads), hence the lack of an article. Ultimately, it's not the presence of the article with numerals that is special – rather, m-merger has the effect of “hiding” the article when an adjective is not present. For I&M (2004, 2016), the indefinite article in the AANN construction does not reflect any semantically hardwired singularity of the AANN combination, and it is expected to pattern with the regular cardinal construction w.r.t. all tests targeting singularity/plurality.

The other class of analyses (Kayne 2005, Solt 2007, Keenan 2013) is based on the opposite view. Although the implementations differ, these analyses share the idea that there is a covert singular noun in the AANN construction. Solt (2007) introduces a coercion operation which causes the numeral to be interpreted as ‘amount’ or ‘number’, so that ‘a surprising 70 students’ turns into ‘a surprising AMOUNT (of) students’. Kayne (2005) introduces a silent noun NUMBER into the syntax of the AANN construction. This analysis comes close to introducing a full-fledged pseudo-partitive structure, which is exactly what Keenan (2013) does, with a hidden noun GROUP. The commonality among these analyses is the hidden singular noun, which is the source of the article. This groups the AANN construction with singular (albeit group-denoting) DPs.

**Core data** to be accounted for by a theory of the AANN construction, falls into two groups: 1) facts that classify the AANN construction with plural DPs; 2) facts that classify it with singular group-denoting DPs. Each aspect of the construction is captured by one of the approaches described above, but the totality of the data calls for an analysis that reflects both aspects of the AANN construction.

First, AANN DPs obligatorily trigger plural agreement on the verb and only allow for plural anaphora, like plural DPs and unlike singular group nouns. For the moment, we use 'committee' as a representative group noun. We also exclude AANN combinations that contain measure nouns, such as 'mile' or 'hour'.

- (3) a. \*A surprising 70 students is planning to apply for this position.  
b. A surprising 70 students applied. \*It is / they are very motivated.  
c. A committee is going to evaluate the proposals. It is well instructed.

The AANN combination participates in distributive constructions and supports distributive inferences more eagerly than group nouns generally do ((6) from de Vries 2015).

- (4) a. A surprising 15 students submitted 2 papers each.  
b. ??A committee evaluated 2 proposals each.  
(5) A surprising 15 students turned out to be partly bald.  
✓each of the students is partly bald; ??some of the students are totally bald

- (6) A committee turned out to be partly bald.  
 ✓each member of the committee is partly bald;  
 ✓some committee members are (totally) bald

Plural DPs and cardinal phrases pattern with AANN rather than with 'committee'. These patterns seem to support a plural analysis along the lines of I&M (2004, 2016).

The second set of facts points in the opposite direction. These facts concern restrictions on the adjectives appearing in the AANN construction. Such adjectives include, first and foremost, evaluative adjectives — ‘surprising’, ‘staggering’, ‘mere’; another group are the modal adjectives, e.g. ‘possible’, ‘alleged’. The last group we call ‘anaphoric adjectives’ – ‘different’ and ‘further’. Importantly, some adjectives are odd in the AANN combination (some restrictions are indicated in Keenen 2013; I&M 2016). These are adjectives of shape, size, color, material, origin (and maybe more).

- (7) a. ??I met a tall five people the other day. (I&M 2016)  
 b. \*She bought a blue six pencils.  
 c. ??I bought a rectangular five tables.

This list includes ‘stubbornly distributive predicates’ (predicates which obligatorily describe atomic individuals rather than the group, see Schwarzschild 2011), but is not limited to them. Say, ‘American’ in ‘American committee’ can characterize the group as a whole rather than its members, targeting the location of the event that served as grounds for forming the group. ‘American’ cannot participate in the AANN construction. We connect these restrictions to the distributivity of these adjectives (details below). Strikingly, these adjectives easily combine with the AANN DP-externally: ‘A mere 4 students turned out to be tall’ (compare (7a)).

**Our analysis** is a combination of the above two views. First, we adopt the pseudopartitive structure for the AANN combination with a silent GROUP noun, like Keenan (2013). Second, we suggest that the group must be broken down to the plurality of its members at the edge of the AANN DP. This captures both aspects of the behaviour of this construction.

We assume, following (Schwarzschild 1996 a.m.o.) that the  $D_e$  domain has the structure of the set of all atomic entities. Plural, non-atomic individuals are sums:  $[[\text{John and Bill}]] = J \oplus B$ . Following (Barker 1992 a.o.) we assume that group nouns denote atomic individuals. The only difference between true singularities and group nouns is that a function  $f$  is defined over group individuals, mapping them to sums consisting of their members:

$$(8) \quad f([[ \text{Committee A} ]]) = \text{John} \oplus \text{Bill} \oplus \text{Mary} \oplus \text{Vera}$$

Pseudo-partitive expressions like ‘committee of the men’ also involve access to the members and thus, function  $f$  (Barker 1992, Schwarzschild 1996):

$$(9) \quad [[ \text{committee of the men} ]] = \lambda x. \text{committee}(x) \ \& \ f(x) \leq [[ \text{the men} ]]$$

At least some group nouns support distributive inferences and participate in distributive constructions. In this case we say that, as the group term combines with a pluralized predicate, the  $f$  function is involved in the interpretation, and thus the group is broken down into the plurality of its members. Pluralisation is defined as closure under sum of P, excluding the empty set (Link 1983, 1998 a.m.o). Pluralisation can be introduced in syntax as a distributivity operator **D**.

$$(10) \quad [[ \text{The group of girls each } \mathbf{D} \text{ submitted an application} ]] = \\
 [[ \text{each } \mathbf{D} \text{ submitted an application} ]](f([[ \text{the group of girls} ]])) = \\
 [\lambda X. \forall x \sqsubseteq X [x \text{ submitted an application}]](\text{Maartje} \oplus \text{Stavroula} \oplus \text{Vera})$$

We propose that whether a group term is prone to revealing the underlying plurality is conditioned by two factors: 1) level of individuation of the members of the group; 2) the grounds for group formation. Both factors have been independently proposed in the literature (Henderson 2014; de Vries 2015). The combination of these factors results in a hierarchy of

group terms, from the most stable to the least stable ones.

(11) swarm, bouquet, grove > committee, trio > group > AANN

‘Swarm nouns’ pattern with other group nouns according to some tests, but combine with stubbornly distributive predicates, always trigger singular agreement and singular anaphora, and are practically out in distributive contexts (Henderson 2014). The reason is the low individuation of swarm-group members and strict spatial criteria for group formation. ‘Committee nouns’ trigger variable sg/pl agreement and anaphora in some varieties of English, and more easily participate in distributive constructions or allow for distributive inferences (de Vries 2015). Nouns like ‘group’ are even more flexible in the membership basis, and this is reflected in their even more ‘plural’ behaviour. Mentioning the members of the group (‘committee of the men’) increases the availability of **f** (Selkirk 1977; Lønning 1989), due to its effect on the individuation of group members.

Finally, we propose that the AANN construction is an example of the least stable group described in the literature so far. We suggest that the silent noun GROUP corresponds (via **f**) to a plurality of individuals described by the Num+Noun phrase. The grounds-for-grouping aspect of the meaning of GROUP is a contextually supplied plural predicate  $\text{GROUNDS}^c$  that has to hold of the plurality of the members constituting the GROUP-individual:

(12)  $[[ \text{GROUP } 20 \text{ students } ]]$  =  
 $\lambda x. \text{GROUP}(x) \ \& \ |f(x)| = 20 \ \& \ \forall y \sqsubseteq f(x)[y \text{ is a student}] \ \& \ \text{GROUNDS}^c(f(x))$

A natural basis for contextual grouping, we claim, is the one that is linguistically given in a sentence. In a sentence like ‘A surprising 20 students turned out to be partially bald’, a prominent basis for grouping the 20 students together would be precisely that each of them is partially bald. In the set-up we are using, this would require making the pluralised predicate ‘D be partially bald’ semantically available. In turn, if the predicate is pluralized, it needs a plural argument — and therefore, for the AANN constituent to combine with the pluralised predicate, it needs the mediation of the **f**-function that would reveal the plurality of its members. The effect is that the AANN constituent seems to obligatorily include both grouping and ungrouping: ‘**f**(A surprising GROUP 20 students) **D** turned out to be partly bald’.

This explains both the plural external distribution of the AANN constituent and its internal group-properties. The pretty complicated grouping-ungrouping involved in this construction might explain its typological rarity (I&M 2016). The restrictions on the adjectives that can appear in the AANN construction result from: 1) the lexical indeterminacy of the  $\text{GROUNDS}^c$  predicate of our GROUP noun; 2) a competition between ‘a(n) adj num noun’ and ‘a(n) num adj noun’ for distributive adjectives along the lines suggested in (I&M 2016).

The variability in sg/pl verbal agreement of the AANN construction with measure nouns (see Keenan 2013) is, we suggest, due to the low individuation that comes with measure nouns. Similarly, although ‘unpacking’ the AANN groups seems obligatory, it’s rather highly preferred, which can be detected with anaphoric adjectives, which, when part of the AANN construction, allow for group readings of ‘partly’. This indicates that GROUP can select sentence-external  $\text{GROUNDS}^c$  in some cases, if it’s facilitated by other aspects of context:

(13) A further 20 students turned out to be partially bald.  
 $\checkmark$ each of the students is partly bald;  $\checkmark$ some of the students are (totally) bald

**SELECTED REFS:** Henderson (2014) Swarms: Spatiotemporal grouping across domains. Ms. • de Vries (2015) Shifting sets, hidden atoms. PhD diss • Ionin & Matushansky (2004) A singular plural. WCCFL Proceedings • Keenan (2013) ‘A Pleasant three Days in Philadelphia’: Arguments for a Pseudopartitive Analysis. PLC Proceedings • Solt (2007) Two Types of Modified Cardinals. Handout.