Distributivity and agreement: new evidence for groups as sets

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19th Amsterdam Colloquium :: December 18-20, 2013
Main claims of this talk

(1) a. My family is tall.
   b. My family are tall.

- *My family* in (1a) denotes an *atom*, but *My family* in (2b) denotes a *set*.
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• The set denotation is basic. The atomic denotation is derived by a typeshift triggered by a type mismatch.
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• The set denotation is basic. The atomic denotation is derived by a typeshift triggered by a type mismatch.

• Advantages of the proposal:
  - The behaviour of group NPs with different kinds of agreement follows from common assumptions about the semantics of number;
  - Crosslinguistic differences are located in syntax: no need for any language-specific semantic operations or ambiguities.
Outline

Background: quantificational distributivity

Data: Q-distributivity and reciprocity in British English

Analysis: group NPs as sets
   The analysis in a nutshell
   Accounting for other data
   Additional evidence

Conclusions & outlook
Two kinds of distributivity

- There are two ways to derive distributivity: lexical (’P’) and quantificational (’Q’) following e.g. Roberts (1987), Hoeksema (1988), Winter (1997), Champollion (2010), de Vries (2012)

  (2) The girls smiled.
  (3) a. The girls are singing or dancing.
     b. The girls are hiding somewhere.
     c. De kinderen vinden zichzelf erg slim.
        ‘The children consider themselves rather clever’

- P-distributivity: $\boxed{\text{smile}}(\boxed{\text{the girls}}) + \text{lexical/world knowledge}$
- Q-distributivity: a covert quantifier over girls that gives us a logical form like $\forall x \in \text{the girls} \rightarrow (\exists y. \text{hide in}(x, y))$
Q-distributivity as a diagnostic for semantic number

- Group nouns show that the difference between $P$ and $Q$ is an empirical one: they allow $P$-distributivity but not $Q$-distributivity.

  (4) a. The class smiled.
  b. The team is singing or dancing. ↔ The team is singing or the team is dancing
  c. The class is hiding somewhere. ↔ There is a place $x$ s.t. the class is hiding in $x$
  d. De klas vindt zichzelf erg slim. ↔ The class considers the class very clever

- Straightforward explanation: group nouns range over atomic entities

- But this is not the whole story…
Q-distributivity with group NPs in BrE

- In British English, agreement choice determines the availability of Q-distributivity.

  (5) a. The team is singing or dancing. # no DI
  b. The team are singing or dancing. ✓ DI

  (6) a. The class is hiding somewhere. # no DI
  b. The class are hiding somewhere. ✓ DI

- Quantitative data from small pilot study (a truth value judgement task where informants judged sentences in the context of a ‘distributive’ situation):

<table>
<thead>
<tr>
<th>NP</th>
<th>VP</th>
<th>%true</th>
</tr>
</thead>
<tbody>
<tr>
<td>def. plural</td>
<td>plural</td>
<td>83%</td>
</tr>
<tr>
<td>group</td>
<td>plural</td>
<td>61%</td>
</tr>
<tr>
<td>group</td>
<td>singular</td>
<td>23%</td>
</tr>
</tbody>
</table>
Reciprocity with group NPs in BrE

- Lønning (2011) and Schwarzschild (1996) observe that group nouns are at best marginal with reciprocal predication:
  
  (7) a. *The team is friends.
  b. ??The team usually coaches each other.

- But they seem fine when the predicate is plural. Some examples found with Google:
  
  (8) a. The Team are friends on track as well as off track.[.]
  b. Can a scientific program really change the way the Diaz family love each other?
  c. Remember that your group are neighbours who have to get along outside the group as well as within it.
Generalisation

- Quantification (distributive or reciprocal) is only available with group NPs if the predicate is morphosyntactically plural.
- Conclusion: group NPs denote atoms when they occur with a singular VP, but sets when they occur with a plural VP. Similar suggestions can be found in Barker (1992), Schwarzschild (1996), Sauerland & Elbourne (2002), Sauerland (2004).
Generalisation

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- Various possible ways to analyse this:
  - Ambiguity (suggested in Schwarzschild 1996)
  - Typeshift, atomic denotation is basic (Barker 1992, Sauerland 2004; other parts of Schwarzschild 1996; see also Landman 1989)
  - Typeshift, set denotation is basic (this work)
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Basic assumptions:

(1) Group nouns denote sets of sets (so referential group NPs denote sets)

(2) Morphologically plural VPs denote sets of sets (following Bennett 1974, Link 1983, Winter 2002 and many others...)

For example: if \[ \text{is tall} = \text{tall} = \{j, m\} \ldots \]

...then \[ \text{are tall} = \ast\text{tall} = \emptyset(\{j, m\}) - \emptyset = \{\{j\}, \{m\}, \{j, m\}\} \]

(3) Set-denoting referential NPs can be mapped to a corresponding impure atom (following Link 1984, Landman 1989, Winter 2002, 2007)

We will write the impure atom corresponding to the set \{j, m\} as \[ \uparrow(\{j, m\}) \]. This notation is borrowed from Landman but I am not committed to his or any other particular set-theoretical analysis of this typeshift.)
The analysis in a nutshell (2)

- Type mismatch for sentences like *The group is tall*:

\[
\text{tall}_{et}(\text{the-group}_{et})
\]
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- Type mismatch for sentences like *The group is tall*:
  
  \[ \text{tall}_{et}(\text{the\_group}_{et}) \]

- Two resolution strategies: either ‘incorrect’ agreement (a plural VP even though the group NP is singular), or an atomic interpretation of the group NP:
  
  1. \[ \langle \text{The group is tall} \rangle = \text{tall}_{et}(↑(\text{the\_group})_{e}) \]
  2. \[ \langle \text{The group are tall} \rangle = \ast\text{tall}_{et,t}(\text{the\_group}_{et}) \]
The analysis in a nutshell (2)

• Type mismatch for sentences like *The group is tall*:
  \[
  \text{tall}_{et} (\text{the}_{-}\text{group}_{et})
  \]

• Two resolution strategies: either ‘incorrect’ agreement (a plural VP even though the group NP is singular), or an atomic interpretation of the group NP:
  
  (1) \[ [\text{The group is tall}] = \text{tall}_{et} (\uparrow (\text{the}_{-}\text{group}_{e})) \]
  
  (2) \[ [\text{The group are tall}] = \ast \text{tall}_{et,t} (\text{the}_{-}\text{group}_{et}) \]

• Impure atom formation (1) is always available, mismatched agreement (2) is available if the syntax allows it (it does in BrE, but not in AmE)
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Barker’s observation on *old*

- Barker (1992): (9a-b) are interpreted differently

\[(9) \quad \begin{array}{ll}
\text{a. The committee is old.} & \checkmark \text{old members} \quad \checkmark \text{old committee} \\
\text{b. The committee are old.} & \checkmark \text{old members} \quad \# \text{old committee}
\end{array}\]

- Under our assumptions, the semantics of (9b) is analysed as $\star \text{old(}_\text{the\_committee}_\text{)}$. For this to be true, each individual member of _the\_committee_ needs to be in the extension of (unstarred) *old*; in other words, _The committee are old_ is true just in case the committee’s members are old.

- (9a) is true iff $\uparrow \text{(_the\_committeee_)} \in \text{old}$. In this case, we may still draw a P-distributive inference about the individual members of the group.
Pollard & Sag’s observation on *constituted*

- Pollard & Sag (1994): ‘group-level’ predicates like *be constituted*/*founded* cannot be pluralised in BrE:

  (10) *The committee were constituted in 2001.

- Similar to (9b), (10) requires that each individual member of the committee was constituted in 2001, which is nonsense.

(Note that the inferences here only hold in a theory without mixed predicates.)
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Agreement in *there*-sentences

- Any applications of the analysis beyond the domain of group NPs?
- (11b), which is acceptable in colloquial English, seems to lack a Q-distributive interpretation

(11)  
   a. There are two semanticists singing or dancing in my garden.
   b. There’s two semanticists singing or dancing in my garden.

- We can analyse this just like the BrE group noun cases: in (11b), the type mismatch between the singular VP and the plural NP coerces the latter to shift into an impure atom.
- Neither an ambiguity-based nor a ‘fission’-based analysis of the group noun data can account for this.
Conclusions

• Morphologically singular group NPs in British English behave like atoms when they occur with a singular VP, but like sets when they occur with a plural VP.

• If we assume that group NPs are basically set-denoting, their behaviour with different kinds of agreement follows from common assumptions about the semantics of number morphology.

• Other advantages of the proposal:
  - Universal semantics; all crosslinguistic variation is syntactic.
  - Analysis is applicable to a wider range of semantic phenomena involving number mismatches.
Open questions and further research

- What about various kinds of NP/VP number mismatches in other languages? What about languages in which the VP never agrees in number, or languages that do not mark number at all?

- Can we show that group NPs denote sets in languages that do not allow them to take a plural VP? (Perhaps using Pearson’s (2011) ‘half of’-test?)
Thank you!\footnote{Thanks to Yoad Winter for many helpful discussions, Hazel Pearson and Michelle Sheehan for the initial data that sparked my interest in British English, Sophie Chesney and other informants for their judgements, and audiences at LUSH (Leiden University) and the Between Logic and Common Sense project meeting (Utrecht University) for valuable questions, comments and suggestions. This research was supported by NWO VICI grant no. 277-80-002.}