The D-operator doesn't apply at VP level: evidence from alcohol-free coordination

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0. Introduction & main claims

The distributive/collective coordination in (1) has a long history as a “brief but knock-down argument” (Dowty 1986) in favour of the view that distributivity applies at the level of the VP (as in (2a)). The idea is that the alternative analyses in (2b) and (2c) are out because they both force an anomalous distributive reading for met in the bar:

(1) John and Mary met in the bar and had a beer. (see e.g: Lasersohn 1989, Link 1995, Winter 1997; for some possible replies see Van der Does 1993, Gillon 1990 and Ouwayda 2011)

(2) a. John and Mary met in the bar and [had a beer].
   b. [John and Mary] met in the bar and had a beer.
   c. John and Mary [met in the bar and had a beer].

The aim of this talk: to convince you that (1) is not distributive/collective coordination in the relevant sense, and that distributive/collective coordination is actually out!

How? (a) by giving you a lot of different data; and (b) by making several implicit assumptions from past literature explicit, and taking them to their logical conclusions

1. Claim 1: not all distributivity is operator-based

Two possible 'extreme' views on distributivity:

– Scha (1981): direct predication + lexical semantics (no structural difference between (3a) and (3b))
– Link (1983): plural distributive predicates come with a * that supports a distributive inference

(3) a. The students laughed
    → Every student laughed
   b. The students met
    → Every student met

We need * for at least some distributive interpretations (so Link is at least partly right)...

(4) a. The children are hiding somewhere.
   b. The semanticists are singing or dancing.
   c. De kinderen vinden zichzelf erg slim. (Dutch)
‘the children consider REFL very clever’

d. Jan en Grietje zijn dol op hun fysiotherapeut.   (Dutch)
  ‘John and Gretchen are fond of their physiotherapist’

...but (as many people have observed) not necessarily for all of them. (cf. Roberts 1987, Winter 1997, Champollion 2010)

Evidence: group NPs. They are incompatible with *-based distributivity: all the sentences in (5) lack the distributive interpretation of their counterparts in (4).

(5)  
a. The class is hiding somewhere. (=all in the same place)
b. The committee is singing or dancing. (=everyone’s doing the same thing)
c. De klas vindt zichzelf erg slim. (=the class as a whole is clever)
   ‘the class considers REFL very clever’


(6) necessarily for any x and P: x ∉ (*P)_{e,t}

Even so, group NPs are just fine with many simple distributive predicates:

(7) The group laughed / sang / danced / is tall / is friendly...

So, we will distinguish two kinds of distributivity (the terminology is borrowed from Winter 1997):

– Q-distributivity: *-based distributivity (‘q’ for ‘quantificational’)
– P-distributivity: lexical distributivity (‘p’ for ‘predicate’)

1.1 Implementing the P/Q distinction in Winter’s (2002) atom/set framework

The basics of Winter (2002):

– Instead of the traditional collective/distributive/mixed typology, predicates are classified as either atom predicates or set predicates.
– Uninflected atom predicates range over atomic entities (example: laugh, tall, friendly, have a beer)
– Uninflected set predicates range over sets of entities (example: meet, similar, share a beer)
– Plural predicates range over sets – for atom predicates, this is derived using *
– Singular predicates range over atoms – for set predicates this is derived by an operation ∪ that maps every set in the extension of the predicate onto its corresponding impure atom
– Impure atom formation is freely available as a typeshift for referential plural NPs.

(8) a. [[The boys met]] = 1 iff the_boys_{e,t} ∈ meet_{e,t} OR the_boys_{e} ∈ meet_{e}
b. [[The group met]] = 1 iff the_group_{e} ∈ meet_{e}
c. [[The boys laughed]] = 1 iff the_boys_{e,t} ∈ *laugh OR the_boys_{e} ∈ laugh_{e}
d. [[The group laughed]] = 1 iff the_group_{e} ∈ laugh_{e}

In this system, we can define P-distributivity in terms of direct predication over (impure) atoms (as in (8d) and the second option in (8c)) and Q-distributivity as *-based predication (the first option in (8c)). Note that more or less analogously we also have to assume that set predication comes in two flavours, which

1 This is slightly different from the singularisation operation that Winter proposes
I’ll call set collectivity (the first option in (8a)) and atom collectivity (as in (8b) and the second option in (8a)).

2. Claim 2: Have a beer can be P-distributive

As it turns out, we can replace John and Mary in (1) with a group noun and still get a distributive interpretation for have a beer, which according to our above reasoning means that this interpretation must be P-distributive:

(9) a. The soccer team met in the bar and had a beer.
   b. the_team_e \in \downarrow \text{meet}_{et} \cap \text{have a beer}_{et}

But this means we should be able to analyse (1) without *, too:

(10)a. John and Mary met in the bar and had a beer.
   b. \downarrow \{j, m\}_e \in \downarrow \text{meet}_{et} \cap \text{have a beer}_{et}

(How can have a beer be P-distributive – i.e. why is it not like hiding somewhere? Following e.g. De Hoop (1996), who argues that the indefinite in light verb constructions like have a beer denotes a property rather than a quantifier, De Vries (2012) analyses sentences like The team had a beer as P-distributivity over two arguments, a group and a property. Another possibility is to analyse a beer as a quantifier over kinds rather than individuals; in this analysis, too, the precise relation that holds between individual team members and individual instantiations of the kind beer is underspecified, which leaves room for a P-distributive interpretation.)

To sum up our reasoning so far:
– Group NPs, being atomic, are incompatible with D-operator-based distributivity.
– However, the predicate have a beer can be interpreted distributively with a group subject.
– Therefore, this interpretation cannot involve a D-operator.
– This means that we can interpret the coordination in (1) without needing a D-operator anywhere.
– ...which in turn means that we cannot use this example as evidence in favour of a particular position for D.

3. Claim 3: coordination of a collective and a Q-distributive VP is impossible.

So what happens when we coordinate a set predicate with the Q-distributive atom predicates in (4a-d)?

(11)a. The children [met in the playground] and [hid somewhere].
   b. The guests are [gathering in a circle] and [singing or dancing].
   c. De kinderen [verzamelden zich op het schoolplein] en [vonden zichzelf erg slim].
   ‘The children gathered in the schoolyard and considered REFL very clever’
   d. Jan en Grietje zijn [bevriend] en [dol op hun fysiotherapeut].
   ‘John and Gretchen are friends and fond of their physiotherapist’

Most people I asked are unable to interpret the second conjunct distributively!

This is unexpected if it is possible for * to apply to just the second conjunct (note that the missing interpretations reappear when we insert overt each here):
(12) [[The guests are gathering and singing or dancing]]:
\[ \text{the \_guests}_{et} \in \text{gather}_{et} \cap (\text{*sing } \cup \text{*dance})_{et} \]
(true iff each of the guests who gathered is either singing or dancing, which is not the interpretation we get for (11b))

Conclusions:
- coordination of a set predicate + a P-distributive atom predicate is fine, since both can range over impure atoms (the set predicate through a freely available type shift, the atom predicate because it can include impure atoms in its basic denotation)\(^2\)
- coordination of a set predicate + a Q-distributive atom predicate is out, which is unexpected if * could apply to the individual conjuncts

4. Proposed analysis

- See Ouwayda (2011) for a recent proposal that the D-operator applies at NP level, based on data from Lebanese Arabic
- A similar account could probably explain our coordination data
- But today I’ll explore another alternative that can be very easily implemented in our current ‘Winterian’ system
- The syntactic side is very much work in progress – suggestions are quite welcome!

Proposal: * is the semantic correlate of plural inflection and applies at IP level, i.e. to the denotation of the entire VP coordination:

(13) [[The guests are singing or dancing]]:
\[ \text{the \_guests}_{et} \in \text{*} (\text{sing } \cup \text{dance})_{et} \]
(true iff each guest is either singing or dancing – the Q-distributive interpretation)

(14) [[The guests are gathering and singing or dancing]]:
\begin{align*}
\text{a. the \_guests}_{et} & \in \text{*} (\text{gather}_{et} \cap (\text{sing } \cup \text{dance})_{et}) \quad \text{— anomalous!} \\
\text{b. \downarrow \text{the \_guests}}_{et} & \in \downarrow \text{gather}_{et} \cap (\text{sing } \cup \text{dance})_{et} \quad \text{— only possible derivation}
\end{align*}

Intuitively: an uninflected atom and set predicate can’t be coordinated because they are not of the same type. The only way to coordinate them is to first apply our freely available singularisation typeshift to the set predicate. Then:

(15) \[ \downarrow \text{gather}_{et} \cap (\text{sing } \cup \text{dance})_{et} \neq \emptyset \text{ iff the impure atom corresponding to one of the gathering sets is also a member of either sing or dance} \]

So the only available interpretation for the second conjunct in (11b) is a ‘collective’ one, according to which either all the guests are singing, or all the guests are dancing.

4.1 Problems and open questions

- At least some of the sentences in (11) can be analysed as IP (rather than VP) coordination. In that case we would expect mixed coordination to be possible.
- * is related to plural inflection, but there is no one-to-one correspondence: only atom predicates are starred, and only if the subject NP is semantically plural. Perhaps the eventual syntactic story

\(^2\) This holds for most verbal and adjectival atom predicates. Nominal atom predicates seem to have an aversion to impure atoms, compare *This couple is friendly and *This couple is dancing versus *This couple is my guest.
will have to be a more complex feature-checking approach.

5. Conclusions

– Not all distributive interpretations are derived by means of a distributivity operator. Therefore, not every distributive (or partly distributive) sentence can be used to argue for or against certain properties of D/*.
– In particular, we can meet in a bar and have all the beer we like without ever needing D/*.
– Coordination of atom and set predicates is often unproblematic because our impure atom shift can come to the rescue, but this does limit the available interpretations...
– ...in particular, a Q-distributive interpretations of one of the conjuncts is out.

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References