Selective vs. Unselective Quantification over the Atomic Parts of Plural Entities: A Comparison of for the most part and usually

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1 Introduction

Consider the examples in (1) – (6):

(1) a. Yesterday at Paul’s party, Mary talked to a lot of people. They were usually nice.
   b. Yesterday at Paul’s party, Mary talked to a lot of people. For the most part, they were nice.

(2) a. A lot of people listened to Mary’s new composition at the concert yesterday.
   #They were usually interested in serial music.
   b. A lot of people listened to Mary’s new composition at the concert yesterday. For the most part, they were interested in serial music.

(3) a. The people who lectured at this year’s summer school in Paris were usually smart.
   b. For the most part, the people who lectured at this year’s summer school in Paris were smart.

(4) a. ??The people who listened to Peter’s lecture at this year’s summer school in Paris were usually smart.
   b. For the most part, the people who listened to Peter’s lecture at this year’s summer school in Paris were smart.

(5) a. Peter’s girlfriends are usually smart.
   b. For the most part, Peter’s girlfriends are smart.
Peter’s cousins are usually smart.

b. Peter’s cousins are usually smart.

(1a), (3a) and (5a) are all fine and receive readings that can be paraphrased as *Most of the NP VP*.

(2a), (4a) and (6a), on the other hand, are all bad: they do not get QV-readings, which would be the only sensible ones, as the matrix predicates are all individual-level predicates.

The (b)-examples with *for the most part*, on the other hand, are all fine.

Explanation: *Usually* quantifies over situations exclusively. In the cases at hand, it quantifies over the atomic parts of complex situations that are defined on the basis of contextual and/or clause-internal information in combination with world-knowledge. A QV-reading comes about as it is easy to establish a 1:1-mapping between the atomic situations and the atomic parts of the sum individuals denoted by the respective subject DPs.

The atomic parts of the respective situations need to be temporally distributed, however. While it is easy to interpret (1a), (3a) and (5a) in this way, this is impossible in the case of (2a), (4a) and (6a): there, the temporal traces of the atomic situations are either identical or at least overlap considerably.

*For the most part*, on the other hand, is able to quantify over any kind of plural object that can be decomposed into atomic parts. Therefore, it can quantify over the atomic parts of the plural individuals denoted by the respective subject DPs in the (b)-examples directly. The internal constitution of the respective sum individuals therefore does not matter.

**Outline of the talk**

1 Introduction
2 Nakanishi and Romero’s analysis of *for the most part*
3 Our basic analysis of *usually*
4 The coincidence constraint
5 Our analysis of *for the most part*
2 Nakanishi and Romero’s analysis of for the most part

Based on differences regarding focus-sensitivity and the availability of collective readings in sentences with accomplishment verbs (more on this below), Nakanishi & Romero (2004) (henceforth: NR) argue that while the quantificational determiner *most* operates on plural individuals, the Q-adverb *for the most part* operates on plural eventualities.

NR assume that a sentence of the form *For the most part NP VP* has the truth conditions in (7) below, where \( p \) corresponds to the denotation of the non-focussed material, while \( q \) corresponds to the denotation of the focussed material.

\[
(7) \quad \exists e [p(e) \land \exists e'[e' \leq e \land |e'| \geq \frac{1}{2} |e|] \land \forall e''[e'' \leq e' \rightarrow q(e'')]]
\]

(NR: 8).

“There is a general (possibly plural) event \( e \) for which \( p(e) \) holds and there is a (possibly plural) event \( e' \) that is a major part of \( e \) such that, for all subevents \( e'' \) of \( e' \), \( q(e'') \) holds.” (Nakanishi and Romero 2004: 8).

NR assume that a QV-reading “with respect to a given NP arises as a side effect of the following choices” (NR: 9):

(i) The semantic content and thematic predicate on the NP are within the restrictor \( p \).

(ii) The general event \( e \) is ‘measured’ by counting its atomic event units in \([[[V^0]]]\).

(iii) The NP is interpreted distributively in a one-to-one mapping.

According to NR, a sentence such as (9a) is thus interpreted as given in (9b):

\[
(9) \quad \begin{align*}
\text{a. For the most part, the students admire MARY.} \\
\text{b. } & \exists e [ *\text{admire}(e) \land \text{Agent (e, the students)} \land \exists e'[e' \leq e \land |e'| \geq \frac{1}{2} |e|] \\
& \land \forall e''[e'' \leq e' \rightarrow \text{Theme (e'', Mary)}]] (NR: (31b))
\end{align*}
\]
b. “There is a general (possibly plural) event e such that *admire(e) ∧ Agent(e, the students) and there is a (possibly plural) event e’ that is a major part of e such that, for all subevents e’’ of e’, Theme(e’’, Mary)” (NR.: (31c)).

Note that this analysis only works under the following two assumptions:

(a) The individual arguments of verbs are separated from the respective verbal predicate at the level of semantic interpretation.

(b) The denotation of the whole clause minus the Q-adverb is “cut” into two parts: one part that contains non-focal material, and one part that contains focal material.

Although the second assumption is problematic, the basic ideas of this analysis can be applied to sentences with usually that contain plural definites like the ones mentioned in the introduction.

3 Our basic analysis of usually

Assumption: frequency adverbs like usually can quantify over the atomic parts of complex situations. Accordingly, such Q-adverbs have to be ambiguous: in order to account for the QV-readings of sentences with singular indefinites, one still has to assume that there is a version of the respective Q-adverb that establishes a relation between two sets that have (minimal) situations as elements.

The second meaning is modelled after NR’s analysis of for the most part. It introduces two existential quantifiers over (possibly complex) situations, and establishes a relation between the atomic parts of those situations: the cardinalities of the sets of atoms the two situations consist of have to stand in the respective relation.

\[
[[usually]]_2 = \lambda P \lambda Q. \exists s [Q(s) \land C(s) \land \exists s_1 \leq s [|s_1| > \frac{1}{2} |s| \land P(s_1)]]
\]
Note that we assume (following Chierchia (1995)) Q-adverbs to take their arguments in reverse order (seen from the perspective of determiner quantification): they combine with their nuclear scopes first.

Consider sentence (3a), repeated below as (11a) and its LF in (11b):

(11) a. The people who lectured at this year’s summer school in Paris were usually smart.

b. 

Assumptions (see Hinterwimmer 2005 for details):

- It is possible to semantically interpret both copies of a chain created by movement (in addition to the option of replacing the lower copy by a variable and inserting a lambda-operator directly beneath the higher copy (Heim and Kratzer 1998))

- A DP c-commanding a Q-adverb is optionally turned into a situation predicate by applying the predicate $\lambda x \lambda s. \text{in}(x)(s)$ to them.

- Definite DPs contain a free situation variable that can either be resolved to $w_0$ by default or to a contextually salient situation, or be bound by a c-commanding Q-adverb (via the insertion of a situation variable binding operator).

With these assumptions in place, (11a) is interpreted as given in (12):
a. The people who lectured at this year’s summer school in Paris were usually smart.

b. \[\lambda P \lambda Q. \exists s [Q(s) \land C(s) \land \exists s_1 \leq s \left[ \frac{1}{2} | s | \land P(s_1) \right]]\]

(\lambda s. \forall y \in \text{Atom}(\sigma \{ x: \text{person}(x)(s) \land \exists s_1 [\forall y \in \text{Atom}(x): \exists s_2 \leq s_1. \text{lecture}(y)(s_2) \land \tau(s_2) < t_0 \land \text{at}(s. \text{sch})(s_2) ] }) : \exists s_3 \leq s : \text{smart}(y)(s_3) \land \tau(s_3) < t_0)

(\lambda s. \text{in}(\sigma \{ x: \text{person}(x)(w_0) \land \exists s_1 [\forall y \in \text{Atom}(x): \exists s_2 \leq s_1. \text{lecture}(y)(s_2) \land \tau(s_2) < t_0} \land \text{at}(s. \text{sch})(s_2) ] ) ) (s) =

\[\exists s [\text{in}(\sigma \{ x: \text{person}(x)(w_0) \land \exists s_1 [\forall y \in \text{Atom}(x): \exists s_2 \leq s_1. \text{lecture}(y)(s_2) \land \tau(s_2) < t_0} \land \text{at}(s. \text{sch})(s_2) ] ) ] (s) \land C(s) \land \exists s_4 \leq s \left[ \frac{1}{2} | s | \land \forall y \in \text{Atom}(\sigma \{ x: \text{person}(x)(s_3) \land ... \}) : \exists s_4 \leq s_3. \text{smart}(y)(s_4) \land \tau(s_4) < t_0)]]\]

“There is a situation \(s\) containing the maximal sum individual consisting of people who lectured at this year’s summer school in Paris and there is a situation \(s_3\) which (a) is a part of \(s\) and (b) the atoms of which have more than half the cardinality of the atoms of \(s\) and (c) which is such that all atoms of the maximal sum individual in \(s_3\) consisting of people who lectured at this year’s summer school in Paris are smart in \(s_3\).”

Due to the distributive interpretation of the matrix as well as the relative clause predicate, the atoms of the respective situations are easy to determine. Furthermore, as they stand in a 1:1 relation with the atoms of the respective sum individuals, we get a QV-reading, as desired.

4 The coincidence constraint

Remember from the introduction that QV-readings in the examples with \(usually\) are only available under the condition that the respective atomic situations can plausibly be construed as temporally distributed. We therefore add a condition to the denotation of \(usually\) requiring that not all of the situations quantified over have overlapping running times (cf. Lasersohn 1995 and Zimmerman 2003):
(13) \[ [[\text{usually}]]_2 = \lambda P \lambda Q. \exists s [Q(s) \land C(s) \land \neg \forall s_2, s_3 \in \text{Atom}(s): \]
\[ [\tau(s_2) \circ \tau(s_3)] \land \exists s_1 \leq s [\mid s_1 \mid > \frac{1}{2} \mid s_1 \mid \land P(s)]] \]

In addition to that, we assume that situations quantified over need to be temporally located. Therefore, the C-variable (see von Fintel 1994 and Stanley 2000) is resolved to the predicate \( \lambda s. \tau(s) \subseteq i_s \), where \( i_s \) is a free interval variable that needs to be resolved to the most salient interval available.

Now, in an example like the one under discussion, the most salient interval is the temporal trace of the relative clause situation. We thus get (14b):

(14) a. The people who lectured at this year’s summer school in Paris were usually smart.

b. \( \exists s [\text{in}(\sigma\{x: \text{person}(x)(w_0) \land \exists s_1 [\forall y \in \text{Atom}(x): \exists s_2 \leq s_1. \text{lecture}(y)(s_2) \land \tau(s_2) < t_0 \land \text{at}(s. \text{sch.})(s_2) \})](s) \land \tau(s) \subseteq \tau(s_1) \land \neg \forall s_2, s_3 \in \text{Atom}(s): \tau(s_2) \circ \tau(s_3) \land \exists s_1 \leq s [\mid s_1 \mid > \frac{1}{2} \mid s_1 \mid \land \forall y \in \text{Atom}(\sigma\{x: \text{person}(x)(s_3)\ldots..\}): \exists s_4 \leq s_3. \text{smart}(y)(s_4) \land \tau(s_4) < t_0)]\]

As the restrictor situation is temporally located within the running time of the relative clause situation, and as both situations are complex situations consisting of atomic parts, it is natural to assume that the atomic parts of the restrictor situation are located within the atomic parts of the relative clause situation, i.e. for each atomic part \( s_1 \) of the former there has to be an atomic part \( s_2 \) of the latter such that the running time of \( s_1 \) is contained within the running time of \( s_2 \).

The easiest way to define the temporal trace of a complex situation \( s \) is to define it as the smallest (possibly discontinuous) interval that includes the temporal traces of all atomic parts of \( s \). This is given more formally in (15):

(15) \( \tau(s) \) where \( s \) is a complex situation that is defined on the basis of its atomic parts :=
\[ \forall s_1 [s_1 \in \text{Atom}(s) \rightarrow \tau(s_1) \subseteq t] \land \forall t_1 [\forall s_2 [s_2 \in \text{Atom}(s) \rightarrow \tau(s_2) \subseteq t_1] \rightarrow t \subseteq t_1] \]
Note that $\tau(s)$ in the formula above is understood to be discontinuous if the atoms that make up $s$ are temporally distributed, i.e. $\tau(s)$ does not contain the stretches of time that lie in between the temporal traces of those atoms.

Consequence: The atomic parts of the restrictor situation are only temporally distributed if the atomic parts of the situation within whose temporal trace the restrictor situation is located are temporally distributed as well.

Now, in example (14a), there is no problem, as it is plausible to assume that not all lectures took place at the same time. In an example like (4a), on the other hand (repeated below as (16a)), this is different: listening to a lecture normally means listening to it from start to finish. Therefore, as all of the atomic listening situations have identical temporal traces, the atomic restrictor situations have identical running times as well.

(16) a. The people who listened to Peter’s lecture at this year’s summer school in Paris were usually smart.

b. $\exists s [\in(\sigma \{ x: \text{person}(x)(w_0) \land \exists s_1[\forall y \in \text{Atom}(x): \exists s_2 \leq s_1. \text{listen}_P.'s_l.(y)(s_2) \land \tau(s_2) < t_0 \land \text{at}(s. \text{sch.})(s_2) ])\})(s) \land \tau(s) \subseteq \tau(s_1) \land \neg \forall s_2, s_3 \in \text{Atom}(s): \tau(s_2) \circ \tau(s_3) \land \exists s_3 \leq s [ \frac{1}{2} \mid s_3 \mid > \frac{1}{2} \mid s \mid \land \forall y \in \text{Atom}(\sigma \{ x: \text{person}(x)(s_3). \land \ldots \}), \exists s_4 \leq s_3. \text{smart}(y)(s_4) \land \tau(s_4) < t_0]]$

Note that this makes the sentence necessarily contradictory: On the one hand, it is clear that all the atomic restrictor situations all have overlapping running times. On the other hand, it is required that not all of them have overlapping running times. We assume that this is the reason why (14a) does not have a QV-reading. A non-QV-reading, on the other hand, is out because $\text{be smart}$ is an individual-level predicate. Therefore, the sentence is odd.

Examples (1a) and (2a) (repeated as (17a) and (18a)) are similar, the only difference being that the free situation variable in the restrictor is resolved to the temporal trace of the situation introduced in the previous clause. Note that we assume the two sentences in (17a)
and (18a) to be conjoined via dynamic conjunction. Furthermore, we take the pronouns to be the surface forms of definite DPs that have undergone NP-ellipsis, which is licensed under identity with some immediately preceding NP (Elbourne 2005):

(17) a. Yesterday at Paul’s party, Mary talked to a lot of people. They were usually nice.

b. $\exists s [\text{at}(\text{the party yesterday})(s) \land \exists x [\text{human}(x)(w_0) \land |x| \geq n \land \forall y \in \text{Atom}(x) : \exists s_1 \leq s. \text{talk_to}(y)(\text{Mary})(s_1) \land \tau(s_1) < t_0 \land \exists s_2 [\text{in}(\sigma\{z: \text{human}(x)(s)\})(s_2) \land \tau(s_2) \subseteq \tau(s) \land \neg \forall s_2, s_3 \in \text{Atom}(s_2): \tau(s_2) \circ \tau(s_3) \subseteq s_2 [\frac{1}{2} s_3 > \frac{1}{2} s_2] \land \forall k \in \text{Atom}(\sigma\{z: \text{human}(x)(s)\}): \exists s_4 \leq s_3. \text{nice}(y)(s_4) \land \tau(s_4) < t_0]]]$

(17a) is fine, as it is plausible that Mary did not talk to all people at the same (or overlapping) time(s).

(18) a. A lot of people listened to Mary’s new composition at the concert yesterday.

#They were usually interested in serial music.

b. $\exists s [\text{at}(\text{the concert yesterday})(s) \land \exists x [\text{human}(x)(w_0) \land |x| \geq n \land \forall y \in \text{Atom}(x) : \exists s_1 \leq s. \text{listen_to}(\text{Mary’s new composition})(y)(s_1) \land \tau(s_1) < t_0 \land \exists s_2 [\text{in}(\sigma\{z: \text{human}(x)(s)\})(s_2) \land \tau(s_2) \subseteq \tau(s) \land \neg \forall s_2, s_3 \in \text{Atom}(s_2): \tau(s_2) \circ \tau(s_3) \subseteq s_2 [\frac{1}{2} s_3 > \frac{1}{2} s_2] \land \forall k \in \text{Atom}(\sigma\{z: \text{human}(x)(s)\}): \exists s_4 \leq s_3. \text{interested_in_serial_music}(y)(s_4) \land \tau(s_4) < t_0]]]$

The problem with (18a) is the same one as with (16a): As all the atomic parts of the situation within whose temporal trace the restrictor situation is located have overlapping running times, the atomic parts of the restrictor situation have overlapping running times as well, which is necessarily contradictory.

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1 See Groenendijk and Stokhof 1990, Staudacher 1987 and Chierchia 1995 for the details of dynamic semantics
Finally, the difference between (5a) and (6a) (repeated below as (19a) and (20a) is due to world knowledge: in the case of (5a), it is plausible to assume that the atomic parts of the restrictor situation are temporally distributed, as one usually has only one girlfriend a time.

In the case of (6a), on the other hand, world knowledge dictates that the temporal traces of all the atomic parts of the restrictor situation overlap: having a cousin is a property one only ceases to have if the respective person dies. Therefore, (6a) would only fulfill the coincidence constraint if apart from the first one no cousin of Peter is born before another one died – which is an extremely implausible scenario.

(19) a. Peter’s girlfriends are usually smart.
   b. $\exists s \left[ \in (\sigma \{ z: \text{Peter’s girlfriends}(x)(w_0) \}) (s) \land \tau(s) \subseteq \tau(s^*) \land \neg \forall s_2, s_3 \in \text{Atom}(s): \tau(s_2) \circ \tau(s_3) \land \exists s_3 \leq s [\|s_3| > \frac{1}{2} \|s_2| \land \forall k \in \text{Atom}(\sigma \{ z: \text{Peter’s girlfriends}(x)(s_3) \}) : \exists s_4 \leq s_3. \text{smart}(y)(s_4) \land \tau(s_4) < t_0]]\],

where $s^*$ is the unique situation such that for each of Peter’s girlfriends $x$ there is a subsituation $s_1$ of $s^*$ such that $s_1$ is the maximal situation of Peter being together with $x$.

Formally:

$s^* = \text{ts}[\forall x[x \in \text{Atom}(\sigma \{ y: \text{Peter’s girlfriend}(y)(w_0) \}) \rightarrow \exists s_1 \leq s^*[s_1 = \sigma \{ s: \text{together}(x)(\text{Peter})(s) \}]]]$

(20) a. "Peter’s cousins are usually smart.
   b. $\exists s \left[ \in (\sigma \{ z: \text{Peter’s cousins}(x)(w_0) \}) (s) \land \tau(s) \subseteq \tau(s^*) \land \neg \forall s_2, s_3 \in \text{Atom}(s): \tau(s_2) \circ \tau(s_3) \land \exists s_3 \leq s [\|s_3| > \frac{1}{2} \|s_2| \land \forall k \in \text{Atom}(\sigma \{ z: \text{Peter’s cousins}(x)(s_3) \}) : \exists s_4 \leq s_3. \text{smart}(y)(s_4) \land \tau(s_4) < t_0]]\],

where $s^*$ is the unique situation such that for each of Peter’s cousins $x$ there is a subsituation $s_1$ of $s^*$ such that $s_1$ is the maximal situation of $x$ being Peter’s cousin.

Formally:
5 Our analysis of for the most part

Remember that for the most part does not seem to be sensitive to the coincidence constraint:

(21) a. A lot of people listened to Mary’s new composition at the concert yesterday. For the most part, they were interested in serial music.
   b. For the most part, the people who listened to Peter’s lecture at this year’s summer school in Paris were smart.
   c. For the most part, Peter’s cousins are smart.

In order to account for this difference between for the most part and usually, we assume (contra NR) that for the most part does not necessarily quantify over situations, but rather over objects of any kind as long as these objects can naturally be decomposed into parts (cf. Lahiri 2002. Further evidence:

(22) For the most part, Adorno liked Mahler’s fifth symphony.

We therefore assume that for the most part takes individuals of all kinds – abstract ones as well as concrete ones, and atomic individuals as well as sum individuals – that have parts as one of its argument, and a predicate, i.e. a relation between individuals and situations as its other argument.

Furthermore, we assume that it yields the value true if there is a part y of the respective individual x whose cardinality is more than half the cardinality of x such that for all parts z of y there is a situation s’ such that z and s’ stand in the respective relation to each other:
As *for the most part* may either be adjoined to the vP or to the clause as a whole, it needs to be ensured that it combines with its two arguments in the right order. *As for the most part* is sensitive to information structure in the same way as adverbs of frequency, we assume that the same mapping algorithm applies to *for the most part* and *usually*: topical (and therefore deaccented DPs) need to c-command the respective Q-adverb at LF.

Concerning this lower copy, however, one of the other options mentioned in section 4.2 is chosen: it is interpreted as a variable that is bound by a lambda-operator inserted beneath the higher copy, which gets its standard interpretation. Note, however, that we need to assume that this lambda-operator is not inserted *directly* beneath the higher copy (as in Heim and Kratzer 1998), but rather beneath the Q-adverb that the higher copy has been adjoined to – otherwise, we would not create the relation between situations and individuals that the Q-adverb takes as one of its arguments.

An example such as (21c) is thus interpreted as shown in (23b, c):

(23)  
(a) For the most part, Peter’s cousins are smart.
(b) \[\text{TP Peter’s cousins}[\text{TP for the most part} \lambda_x \lambda_x]\]
(c) \(\lambda x y \exists s y \leq x \land y > \frac{1}{2} \land x \land \forall z [z \leq y \to \exists s’ [s’ \leq s \land P(z, s’)]]\)

Note that distributivity is built directly into the meaning of *for the most part*, thus accounting for the fact observed by NR that *for the most part* in contrast to *most of* is only compatible with a distribute interpretation.
Finally, in order to account for the temporal span reading (NR) of examples like (24a) (NR: (16)), we assume that the respective temporal adverb has been elided at PF, but is still present at LF, where it adjoins directly above the Q-adverb. Being an abstract individual referring to an interval, it becomes the first argument of for the most part:

(24)  

a. Q: What did Amy do yesterday?  
A: For the most part, she was building a sand castle. 
≈ Most of yesterday was spent by Amy in building a sand castle.

Conclusion

In this paper we have argued that while usually is only able to quantify over situations, for the most part can quantify over all kinds of objects that can be decomposed into parts. Evidence: In the case of usually, the atomic parts of the situations quantified over need to be temporally distributed, while in the case of for the most part there is no such restriction. We have shown how contextual and/or clause-internal information in combination with world knowledge determines how the restrictor situation is conceptualized in the case of usually, i.e. whether it is understood to consist of atomic parts with overlapping running times or not.

References


