

Quantificational Variability Effects with Plural Definites: Quantification over Individuals or Situations?*

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In this paper we discuss the fact that not only adverbially quantified sentences with singular indefinites or bare plurals, but also ones containing plural definites show *Quantificational Variability Effects* (QVEs), i.e. they receive readings according to which the quantificational force of the respective DP seems to depend on the quantificational force of the Q-adverb. We show that if the Q-adverb is a *frequency adverb* like *usually*, there is strong evidence that QVEs come about as indirect effects of a quantification over situations. This conclusion is based on the fact that in such cases the availability of QVEs is constrained in ways that have no parallel in sentences containing *adverbs of quantity* like *for the most part* or quantificational DPs instead of frequency adverbs. We show that these constraints can be derived from plausible assumptions about how the situations to be quantified over are constrained: they have to be located in time on the basis of the most specific locally available information, and their running times are not allowed to overlap.

Adverbial Quantification, Situations, Tense Semantics, Adverbs of Frequency, QVEs

1 Introduction

Consider the sentences in (1a, c) below, which have prominent readings that can be paraphrased as in (1b, d), respectively¹:

- (1) a. The people who lectured at the conference last summer were usually Japanese.

* Parts of this paper have been presented at *Sinn und Bedeutung 9* in Nijmegen and at the *Semantics Circle* at ZAS, Berlin. We would like to thank the audiences of both events as well as Sigrid Beck, Andreas Haida, Christian Krause, Manfred Krifka, Peter Staudacher, and Malte Zimmermann for discussion, comments, and technical help. Furthermore, we would like to thank two anonymous reviewers for their valuable comments and helpful suggestions. This research was partly funded by the Deutsche Forschungsgemeinschaft as part of the Sonderforschungsbereich 632 (Information Structure).

¹ Note that the availability of this reading depends on the hearer's willingness to make certain default assumptions, namely (in the case of (1a), for example) that the lectures (at least in their majority) are given by single persons, and that no person is giving more than one lecture. If the context makes it clear that these conditions are not fulfilled, a QV-reading is no longer possible (more on this below).

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- b. Most (of the) people who lectured at the conference last summer were Japanese.
 - c. The lions that Peter saw during the safari usually had a mane.
 - d. Most (of the) lions that Peter saw during the safari had a mane.

Also the sentence in (2) has a prominent reading that can be paraphrased as in (1d).

- (2) For the most part, the lions that Peter saw during the safari had a mane.

This phenomenon, i.e. that adverbially quantified sentences have readings that can be paraphrased by sentences where the respective Q-adverb has been replaced by a quantificational DP of corresponding quantificational force, is generally referred to as the *Quantificational Variability Effect* (QVE) (since Berman 1991). It is usually discussed in connection with sentences containing singular indefinites or bare plurals such as those in (3a) and (3c), whose QV-readings are given in (3b, d), respectively.

- (3) a. A lion is usually brave.
 b. *Most lions are brave.*
 c. Lions are often brave.
 d. *Many lions are brave.*

Notice, though, that in contrast to frequency adverbs like the ones in (3a) and (3c), the Q-adverb *for the most part* needs to be combined with a bare plural (or a plural definite) in order to give rise to QVEs. This is evidenced by the contrast between (4a) and (4c): while the most prominent reading of (4a) is the QV-reading given in (4b), (4c) lacks such a reading. The sentence is deviant if *be smart* receives its standard interpretation as an individual level predicate (henceforth: *i-level predicate*) and is not re-interpreted as a stage level predicate (henceforth: *s-level predicate*) meaning *to behave in a smart way* (see Kratzer 1995 and Chierchia 1995a on the difference between the two types of predicates as well as on the possibility of re-interpreting i-level predicates as s-level predicates).

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- (4) a. For the most part, lions are smart.
- b. *Most lions are smart.*
- c. * For the most part, a lion is smart.

Concerning the QV-readings of sentences like the ones in (3) above, two different types of explanation have been offered in the literature. The first one treats QVEs as the direct result of a quantification over individuals that comes about in the following way: Q-adverbs are unselective binders, capable of binding free variables of any type in their scope. Furthermore, singular indefinites as well as bare plurals are analyzed as open expressions introducing free variables whose values have to satisfy the respective NP-predicate (see Kamp 1981, Heim 1982, Diesing 1992 and Kratzer 1995 for details).

The second type of explanation treats QVEs as the indirect result of a quantification over (minimal) situations/events that each contain exactly one individual satisfying the NP-predicate. This is a consequence of the respective DPs – which are interpreted as generalized quantifiers with existential force – being interpreted in the restrictor of the Q-adverb. Furthermore, since the (minimal) situations/events quantified over are exclusively individuated via the (denotation of the) respective DP, the value assigned to the individual variable bound by the existential quantifier has to vary with the value assigned to the situation/event variable bound by the Q-adverb. This explains the “illusion” that the respective Q-adverb quantifies over individuals directly (see Berman 1987, de Swart 1993, von Stechow 1994, 2004 and Herburger 2000 for details).

Concerning sentences with plural definites, in contrast, the only discussions of QVEs we are aware of can be found in Graff (2001, 2006) and Nakanishi and Romero (2004). But neither of them discusses sentences like (1a): Graff is primarily concerned with sentences like (5a), where the definite DP is modified by a possessive PP that contains an indefinite DP. Nakanishi & Romero, in contrast, exclusively discuss sentences like (5c), which contain the Q-adverb *for the most part*.

- (5) a. The parents of a toddler usually have little time for relaxation.
(Graff 2006: ex. (44a))
- b. *Most parents of a toddler have little time for relaxation.*

- c. For the most part, the students admire Mary.
(Nakanishi and Romero 2004: ex. (31a))
- d. *Most (of the) students admire Mary.*

Graff (2001, 2006) explains the fact that a sentence like (5a) has a prominent reading that can be paraphrased as in (5b) as follows: the definite article introduces a maximality condition. It turns the (characteristic function of the) set denoted by the respective NP-predicate into the (characteristic function of the) singleton that contains “the *highest-ranked* member of the extension of the common noun” (Graff 2001: 20). In line with Sharvy (1980) and Link (1983) she takes singular nouns to denote sets of atoms, and plural nouns to denote sets of sums of atoms. So in case the definite article combines with a plural noun, it returns the singleton set consisting of the maximal sum in the original set. Concerning singular nouns, in contrast, the definite article can only be combined with such a noun if it denotes a singleton set in the first place, as there is no natural ordering available for the members of a set of atoms.

The only difference between the approach of Sharvy (1980) and Link (1983), on the one hand, and the approach of Graff (2001, 2006), on the other, is that the former assume that the definite article turns a set into an individual, while the latter assumes that the definite article turns a set into a singleton set. Furthermore, Graff (2001, 2006) assumes that definites (as well as singular indefinites and bare plurals) in argument position function as the first argument (i.e. the restrictor) of either an overt Q-adverb (if present) or of a covert existential quantifier or generic operator. Accordingly, a sentence like (5a) can be interpreted as shown in (6) if the definite DP functions as the first argument of the Q-adverb *usually*.

- (6) Most x [$\exists y$ [y is a toddler \wedge x are the parents of y]] [x have little time for relaxation]

Note that the QV-reading in this case is a mere consequence of the fact that the maximality condition associated with the definite article is relativized with respect to the individuals introduced by the indefinite *a toddler*: for each such individual y there is a different sum individual that uniquely satisfies the predicate *parents of y* . Since no element which may induce such a relativization is present in the case of (1a), this account is not general enough to cover the cases discussed in this paper.

The account of Nakanishi & Romero (2004) will be discussed below. For the moment, suffice it to say that according to these authors the QV-reading of a sentence like (5c) does not come about via direct quantification over the atomic parts of the plural individual denoted by the definite DP, but rather indirectly, via quantification over the parts of a sum eventuality. Crucially, those parts stand in 1:1-correspondence to the atoms that the sum individual consists of.

Somewhat ironically, we will argue below that while there are indeed good reasons to adopt a similar approach in the case of sentences like (1a), which combine plural definites with frequency adverbs like *usually*, there is evidence that the QV-readings of sentences such as (5c) do not come about in the indirect way assumed by Nakanishi & Romero (2004). Rather, the Q-adverb *for the most part* directly quantifies over the atomic parts of the sum individual denoted by *the students*. Our argument is based on contrasts like the ones in (7) – (9):

- (7) a. The people who lectured at the conference last summer were usually Japanese.
b. Most (of the) people who lectured at the conference last summer were Japanese.
c. For the most part, the people who lectured at the conference last summer were Japanese.
- (8) a. * The people who lectured at the conference last summer are usually Japanese.
b. Most (of the) people who lectured at the conference last summer are Japanese.
c. For the most part, the people who lectured at the conference last summer are Japanese.
- (9) a. * The people who listened to Peter's talk at the conference last summer were usually Japanese.
b. Most (of the) people who listened to Peter's talk at the conference last summer were Japanese.
c. For the most part, the people who listened to Peter's talk at the conference last summer were Japanese.

Consider the contrast between (7a) and (8a) first: (7a), where the tense of the matrix verb and the tense of the relative clause verb agree, is grammatical, and receives a QV-reading. (8a) on the other hand, where the relative clause verb is marked for past tense, while the matrix verb is marked for present tense, does not have such a reading. It only has a reading according to which the sentence is true if everyone among a certain plurality of people that have the property of having lectured at the conference last summer is Japanese in most salient situations. As *be Japanese* is an i-level predicate that is very hard or almost impossible to re-interpret as an s-level predicate, the sentence is very odd.

The crucial point to note is that the same lack of agreement between the respective tense markings does not seem to matter if the Q-adverb *usually* is replaced by the determiner quantifier *most* or the Q-adverb *for the most part*: (8b, c) are both just as acceptable as (7b, c). A plausible explanation for this difference relies on the assumption that the domains of quantification differ in the respective cases: while this domain consists of eventualities/situations in the case of (7a) and (8a), it consists of individuals in the case of (7b, c) and (8b, c). Based on this assumption, we will argue below that quantification over eventualities/situations must obey a constraint called the *tense agreement constraint*, which does not hold for quantification over individuals. This constraint is violated in the case of (8a).

Next, consider (9a): the sentence is odd in spite of the fact that the tenses of the matrix verb and the relative clause verb agree. The only difference between (7a) and (9a) concerns the internal constitution of the eventualities introduced by the respective relative clauses: in the case of (7a) it is plausible to assume that this eventuality consists of parts that are temporally distributed, since there is no reason to assume that all lectures given at a conference take place at the same time. In the case of (9a), in contrast, it is almost inevitable to assume that the relative clause eventuality consists of parts that coincide temporally (or at least overlap to a very high degree), as one normally listens to a talk from start to finish. It seems that this difference in the internal constitution of the respective eventualities is responsible for the fact that (9a) in contrast to (7a) does not get a QV-reading. We refer to this constraint on the internal constitution of the eventualities introduced by the respective relative clauses as the *coincidence constraint*.

Again, we take the fact that both (9b) and (9c) are acceptable to constitute evidence in favor of our assumption that the respective quantificational domains differ. Furthermore, we

will show below that the oddity of (9a) is not an isolated fact, but fits into a general pattern that can be explained by assuming that quantification over situations/events is constrained in a way that does not hold for quantification over individuals. The facts discussed in this paper thus give us important clues as to how situations are to be individuated for the purposes of quantification, and they show that the local context in which a bound situation variable occurs plays an important role in this process, thus providing additional evidence for the context-sensitivity of adverbial quantification. Last, but not least, they show that explaining QVEs in terms of quantification over situations/eventualities is not only a viable alternative to unselective binding-approaches, but rather the only available option in the case of sentences with frequency adverbs.

The paper is structured as follows. In section 2.1 we give some background on how QVEs in sentences with singular indefinites can be accounted for under the assumption that Q-adverbs exclusively quantify over situations/eventualities. In section 2.2 we discuss a *prima facie* plausible way of accounting for QVEs in sentences with plural definites under the assumption that these come about as indirect effects of quantification over situations. While this account works well in many cases, we show that it does not yield the correct results for sentences such as (8a). In section 3.1 we discuss Nakanishi & Romero's (2004) analysis of QVEs in sentences with the Q-adverb *for the most part*, and in sections 3.2 and 3.3 we show that an analysis using the same basic mechanism in combination with plausible assumptions concerning the temporal location of situations can explain the *tense agreement constraint* exemplified by (8a). In section 3.4 we discuss these results in light of the *coincidence constraint* in order to account for the oddity of sentences like (9a). Section 4 summarizes the main results of the paper.

2 Co-Varying Individuals

2.1 Background: QVEs in Sentences with Singular Indefinites

In this section we discuss how QVEs in sentences with singular indefinites can be explained as indirect effects of quantification over situations. Note that we assume the respective indefinite DPs to be de-accented in the examples discussed below, while the main accent of the clause (which is indicated by capital letters) is on the most deeply embedded VP-internal element. This has the consequence that the indefinite DP is interpreted as non-focal, while the

rest of the clause is interpreted as focal (see Selkirk 1995 for details regarding the relation of accent placement and focus interpretation).

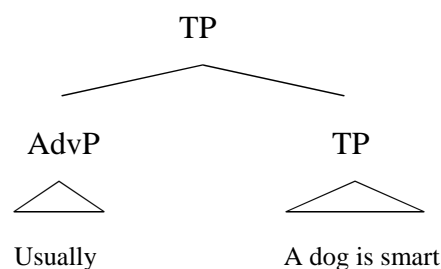
This is important because it is well known that information structure plays an important role when it comes to determining the arguments of Q-adverbs – in contrast to the arguments of determiner-quantifiers, which are provided by the syntax. Glossing over some differences, most approaches to adverbial quantification agree on a mapping algorithm that can be informally described as follows (and that we will also assume for the time being; but more on this in section 4 below): the first argument (the restrictor) of a Q-adverb is the denotation of the non-focal part of the clause containing it, while the second argument (the nucleus) is the denotation of the whole clause minus the Q-adverb (see Rooth 1985, 1995, Chierchia 1995a, Krifka 1995, 2001, Partee 1995 and Herburger 2000 for details). Note, however, that Beaver and Clark (2003, 2007) have recently shown convincingly that association with focus is presumably not conventionalized in the case of Q-adverbs – in contrast to operators like *only* – but rather comes about in a way that can roughly be described as follows: the first argument, i.e. the restrictor, of a Q-adverb initially consists of a free variable ranging over event/situation predicates that needs to be resolved on the basis of contextual information. Since the non-focal part of a sentence corresponds (at least weakly) to given information, the situation/event predicate that is obtained via the algorithm sketched above is thus in most cases identical to the one that can be inferred on the basis of contextual information (see also von Stechow 1994, 2004). Furthermore, in the case of sentences that are presented in isolation, focus marking gives an important clue as to how the variable in the restrictor of the Q-adverb is to be resolved. Thus, in order to be mapped onto the restrictor of a Q-adverb, a DP (at least in the default case) needs to be non-focal.

As already mentioned in the introduction, the fact that a sentence like (10a) below receives the interpretation paraphrased in (10b) can be explained as an indirect effect of quantification over situations: under the assumption that Q-adverbs like *usually* quantify over *minimal* situations exclusively (i.e. situations that contain nothing beyond what is strictly speaking required to satisfy the respective predicate; see von Stechow 1994 for detailed discussion), the truth conditions of sentences where an indefinite DP is interpreted in the restrictor of a Q-adverb come out equivalent to the truth conditions of sentences where the combination of Q-adverb and indefinite DP has been replaced by a quantificational DP of corresponding quantificational force.

(10) a. A dog is usually SMART.

b. Most dogs are SMART.

Let us assume, following Kratzer (1989) and von Stechow (1994), that verbal as well as nominal and adjectival predicates and quantificational determiners take an additional situation argument. Furthermore, we follow the spirit of Beaver and Clark's (2003, 2007) account sketched above, and assume for concreteness that frequency adverbs such as *usually* adjoin to TP at LF, taking the denotation of the TP-segment they c-command as their nuclear scope, while the restrictor initially consists of a free variable that (in cases where a sentence is presented in isolation) is resolved on the basis of focus marking by default². Since in the cases under consideration the indefinite corresponds to the non-focal part of the TP, the free variable is resolved to a predicate which characterizes situations containing an individual that satisfies the respective NP-predicate. Consider the LF of example (10a):



The denotation of *usually* is given in (11a), the denotation of the lower TP-segment in (11b), and (11c) shows the situation predicate that the free variable in the restrictor of *usually* is resolved to. (11d) gives a simplified version of the result of combining the three objects.

² See Hinterwimmer (2008) for a different account, which is mainly based on facts concerning the interaction of Q-adverbs and strong quantificational DPs and on empirical evidence from German, where DPs can be reordered via scrambling, and where the mapping from overt syntax to interpretation is thus more straightforward: non-focal/topical object indefinites have to be moved to a position where they c-command the Q-adverb overtly, while focal subjects tend to remain within their ν P-internal base position, where they are c-commanded by the respective Q-adverb (see also Diesing 1992, Kratzer 1995 and Chierchia 1995b for relevant discussion within an unselective binding approach).

$$(11) \quad a. \llbracket [\text{usually}_C] \rrbracket^g = \lambda P_{\langle s, t \rangle}. \mid \{s: \min(s, \lambda s_1. g(C)(s_1))\} \\ \cap \{s_2: \exists s_3 [s_2 \leq s_3 \wedge \min(s_3, \lambda s_4. g(C)(s_4) \wedge P(s_4))]\} \mid \\ > \frac{1}{2} \mid \{s: \min(s, \lambda s_1. g(C)(s_1))\} \mid$$

where C is a domain-restricting variable of type $\langle s, t \rangle$ and $\min(s, P)$ iff $P(s) \wedge \neg \exists s' [s' < s \wedge P(s')]$

b. $\llbracket [A \text{ dog}_{s^*} \text{ is smart}] \rrbracket^g = \lambda s. \exists x [\text{dog}(x)(g(s^*)) \wedge \text{smart}(x)(s)]$
 where s^* is a situation variable to which g assigns the world of evaluation w_0 by default³.

c. $\lambda s. \exists x [\text{dog}(x)(g(s^*)) \wedge \text{in}(x)(s)]$

d. $\text{Most } s [\min(s, \lambda s_1. \exists x [\text{dog}(x)(w_0) \wedge \text{in}(x)(s_1)])] \\ [\exists s_2 [s \leq s_2 \wedge \min(s_2, \lambda s_3. \exists x [\text{dog}(x)(w_0) \wedge \text{smart}(x)(s_3)])]]]$

‘Most minimal situations that contain a dog can be extended to a minimal situation where a dog is smart’.

Note that the denotation of *usually* given in (11a) has to be so complicated because of the special nature of situations. First, due to the part-whole structure of situations, minimality is required in order to arrive at intuitively correct truth conditions (see von Stechow 1994 and 2004). Otherwise, the existence of one smart dog in the world of evaluation would be sufficient to make (10a) true, since the world of evaluation also counts as a (maximal) situation. Therefore, every (maximal) situation containing a dog is also a (maximal) situation containing a smart dog. Second, existential quantification over situations extending the restrictor situations is required in the nuclear scope because otherwise the two sets would

³ Note that variables of type s range over situations as well as over worlds, where worlds are just maximal situations (Kratzer 1989). The reason for keeping the situation variable in the first argument of determiner quantifiers distinct from the one in the second argument is empirical: there are cases like (i) where the individuals quantified over satisfy the respective nominal predicate at a different time than the verbal predicate (see Musan 1997 and Percus 2000 for discussion).

(i) Most fugitives are in jail again.

Furthermore, there is evidence from sentences with universally quantified DPs that the situation variable in the restrictor of quantificational determiners can only be bound by Q-adverbs under c-command. This can be accounted for under the assumption that a (situation) variable binding operator (in the sense of Büring 2004) is inserted directly beneath the Q-adverb, which has the effect of turning any (co-indexed) free variables in its scope into bound variables (see section 2.2 and section 4; see also Hinterwimmer 2006 and 2008 for detailed discussion).

necessarily be disjoint: a situation that is minimal with respect to a predicate C cannot at the same time be a situation that is minimal with respect to a predicate P (assuming P is not a subset of C). On the other hand, a minimal situation that satisfies the restrictor predicate C and the nuclear scope predicate P can be an *extension* of a situation that minimally satisfies C .

Note furthermore that the minimality conditions ensure that the dogs introduced by the respective situation predicates are the same: a *minimal* situation that contains a dog and that is a situation of a dog being smart contains just one dog (namely a smart one), not two, as being smart in a situation entails being contained in that situation (cf. the simplification in (11d) above). Since we do not want to predict that a sentence like “When a man is rich, a man is happy” can be interpreted as “Most rich men are happy”, we follow von Stechow (1994, 2004) in assuming that the novelty condition (Heim 1982) still applies, but only at the syntactic level. With all these assumptions in place, the truth conditions of our example (10a) are thus identical to those that would result from direct quantification over dogs.

2.2 QVEs in Sentences with Definites

Let us return to sentences like (1c) and (7a), which are repeated here as (12a, b).

- (12) a. The lions that Peter saw during the safari usually had a MANE.
 b. The people who lectured at the conference last summer were usually JAPANESE.

Now, what options are there to explain the fact that such sentences receive QV-readings if one wants to stick to the assumption that Q-adverbs are only able to quantify over situations? It is clear that QVEs in sentences with definites do not come about in the same way as QVEs in sentences with indefinites: in contrast to the indefinite determiner, the definite determiner is not allowed to pick out different individuals from one and the same set in different situations. Rather, it has to pick out the maximal sum individual contained within the set it is applied to (see Sharvy (1980) and Link (1983)). Consequently, co-variation with the situations quantified over by a Q-adverb is excluded if the set denoted by the NP-complement of the definite determiner does not vary with the situations. To put it the other way around, co-variation is only possible if the NP-complement of the definite determiner includes a situation variable that allows the set denoted by this NP to vary with the situations quantified over.

There are indeed cases like (13b), where it is plausible to assume that QVEs arise precisely in this way.

- (13) a. ^{??} The piano-player is usually SMART.
- b. I love going to jazz-concerts: The piano-player is usually SMART (and it's nice to talk to him after the show).

As argued for in detail in Hinterwimmer (2006; 2008), though, and as shown by the unacceptability of (13a) in contrast to (13b), in all these cases the definite DP is solely interpreted in the nuclear scope of the Q-adverb, while the restrictor contains a situation predicate that can be accommodated on the basis of contextual or clause-internal information and that fulfills the following condition: it characterizes a set of situations such that each of those situations can plausibly be assumed to contain either exactly one (in the case of singular definites) or a plurality of individuals (in the case of plural definites) that satisfy the respective NP-predicate. In other words: it is not the case that the situations quantified over are defined on the basis of the denotation of the DP (as with indefinites). Rather, it has to be independently ensured that each of those situations contains individuals/exactly one individual of the required kind.

Hinterwimmer (2006; 2008) argues that this is due to the fact that the definite determiner *presupposes* that the set it applies to contains a unique maximal element. Therefore, in order for this presupposition to be fulfilled at the point where the meaning of the respective definite DP is computed, it has to be guaranteed that each of the situations quantified over makes available such a set. To see this, consider the contrast between (13a) and (13b), and (14a) and (14b).

- (14) a. ^{??} The violin-players are usually TALL.
- b. There's a funny generalization concerning classical concerts: The violin-players are usually TALL.

In the absence of a context that makes available a suitable situation predicate, the definite DPs cannot be interpreted as co-varying with the situations quantified over, and the sentences containing them are very odd, since the matrix predicates are i-level predicates. If such a

context is provided, in contrast, the same definites can be interpreted as co-varying: in (13b), the piano-players vary with the jazz concerts, and in (14b), the violin-players vary with the classical concerts.

There are also cases where no context is required in order to accommodate a suitable situation predicate, but where this is possible on the basis of clause-internal information alone: namely, if the NP-predicate is stereotypically associated with a set of situations such that each of those situations contains either exactly one or a plurality of individuals that satisfy the predicate. Such examples are given in (15):

(15) a. Peter's students are usually SMART.

b. The pope is often ITALian.

In the case of (15a), the noun *students* is naturally associated with a set of suitable situations, namely a set of courses taking place at different times. In the case of (15b), too, the noun is stereotypically associated with a set of situations, albeit “world-size” ones: namely the terms of office of the respective popes.

Technically, we follow Hinterwimmer's (2006; 2008) account of how co-variation arises in the cases under consideration. We assume that not only quantificational determiners (see section 2.1), but also the definite determiner comes with a free variable (s^*) (cf. Buring 2004 and Elbourne 2005), as shown in (16):

(16) $[[\text{the}_{s^*}]]^g = \lambda P_{\langle e, \langle s, t \rangle \rangle}. \sigma \{x: P(x)(g(s^*))\}$,

where x ranges over sums as well as over atomic individuals and where

$\sigma \{x: P(x)(s)\} =_{\text{def}} \lambda x [P(x)(s) \wedge \forall y [P(y)(s) \rightarrow y \leq x]]$ (see Link (1983)).

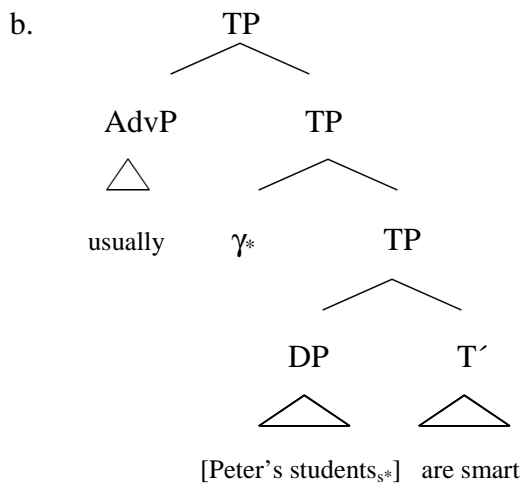
The free variables can either be resolved to w_0 (i.e. to the actual world) by default (as in the case of the indefinites discussed in section 2.1), or to a contextually salient situation, or they can be bound by a Q-adverb that c-commands the respective DP at LF via the insertion of a

(situation) variable binding operator directly beneath the c-commanding Q-adverb⁴. The insertion of this operator has the consequence of turning any free variable in its scope that bears the same index into a lambda-bound variable, as shown in (17). The situation variables thus become bound by the respective Q-adverb when the Q-adverb is combined with its sister via functional application⁵:

- (17) $[[\gamma_n \text{XP}]^g = \lambda s. [[[\text{XP}]^{g[n \rightarrow s]} (s)]$
 where γ_n is the situation variable binding operator and $g[n \rightarrow s]$ is the assignment function that (possibly) differs from the assignment function g insofar as it assigns the value s to all situation variables bearing the numerical index n .

In cases like (13b), (14b) and (15a, b), the option of turning the situation variables into bound variables is chosen. The relevant reading of a sentence like (15a), repeated here as (18a), whose LF is given in simplified form in (18b), can thus schematically⁶ be represented as shown in (18c).

- (18) a. Peter's students are usually SMART.



⁴ Cf. Büring (2004), who argues that pronouns are turned into variables bound by a c-commanding quantificational DP via the insertion of an individual variable binding operator directly beneath the quantificational DP.

⁵ Note that XP is of type $\langle s, t \rangle$, i.e. it is a situation predicate. It therefore has to be applied to the variable s first before lambda-abstraction over this variable takes place, as otherwise we would get an object of type $\langle s \langle s, t \rangle \rangle$, not one of type $\langle s, t \rangle$, which we want.

⁶ For a full specification of the meaning of *usually*, see (11a) above.

- c. Most s [$\min(s, \lambda s_1. \text{course_taught_by_Peter}(s_1))$]
 $[\exists s_2 [s \leq s_2 \wedge \min(s_2, \lambda s_3. \text{course_taught_by_Peter}(s_3) \wedge$
 $\wedge \text{smart}(\sigma\{x: \text{students_of_Peter}(x)(s_3)\})(s_3))]]$]

Returning to examples like the ones in (12a, b), we have to decide whether in those cases QVEs come about in the way just described. Obviously, there is no contextual information on the basis of which a suitable situation predicate could be accommodated – i.e. a predicate that characterizes a set of situations such that each of those situations contains a (different) plurality of individuals satisfying the NP-predicate. This only leaves open the possibility that such a predicate is accommodated on the basis of the NP-predicates themselves.

But is it plausible to assume that these NPs provide the necessary information? Of course, they both contain relative clauses that introduce situations. But those situations already contain *the whole sum of individuals that satisfy the respective predicate* – i.e. the whole sum of lions seen by Peter during his safari (cf. ex. (12a)), and the whole sum of individuals who lectured at the conference (cf. ex. (12b)). This implies, however, that on the basis of these situations no suitable predicate can be accommodated, i.e. no situation predicate such that each of the situations characterized by this predicate contains a *different* set of lions, or a *different* set of people giving lectures. In addition to that, it is not plausible that the NP-predicates are stereotypically associated with a set of situations of the required kind in some other way, as they are far too specific. We therefore conclude that the QV-readings of sentences like (12a, b) do not come about via co-variation of the individuals denoted by the plural definites with the situations quantified over.

One could further speculate that the Q-adverb quantifies over the atomic parts of the sum individuals denoted by the respective DPs. But if this really were the case, it would be completely unexpected that sentences such as (12a, b) have to obey the *tense agreement constraint* mentioned in the introduction, as evidenced by the unacceptability of (19a, c) below, while those in (19b, d) do not. If the Q-adverbs in (19a, c) had the same quantificational domains as the quantificational determiners in (19b, d) – namely individuals – why should the first ones be sensitive to non-agreeing tense markings, while the second ones aren't?

- (19) a. ^{??} The lions that Peter saw during the safari usually have a MANE.

- b. Most of the lions that Peter saw during the safari have a mane.
- c. ?? The people who lectured at the conference last summer are usually JapaNESE.
- d. Most of the people who lectured at the conference last summer are Japanese.

We therefore have to look for a solution that allows us to stick to the assumption that Q-adverbs only quantify over situations. This is what we will do in the next section, where we discuss Nakanishi and Romero's (2004) analysis of *for the most part* and show that a similar mechanism gives the right results for the cases under consideration, which involve frequency adverbs like *usually*.

3 Quantification Over the Parts of Complex Situations

3.1 Nakanishi and Romero (2004) on the Q-adverb *for the most part*

As already mentioned in section 1, a sentence like (20a) has a QV-reading that can be paraphrased as in (20b):

- (20) a. For the most part, the students admire [Mary]_F.
(Nakanishi & Romero (2004): ex. (31a))
- b. Most of the students admire Mary.

Based on differences regarding focus-sensitivity and the availability of collective readings in sentences with accomplishment verbs, Nakanishi & Romero (2004) argue that while the quantificational determiner *most* operates on plural individuals, the Q-adverb *for the most part* operates on plural eventualities. For reasons of space, we simply discuss the mechanism they propose in this section without going into the arguments they offer for adopting their event-based analysis of *for the most part*. This mechanism contains the basic ingredients that are necessary to account for the data discussed above.

Nakanishi & Romero (2004) assume that a sentence of the form *For the most part NP VP* has the truth conditions in (21) below, where **p** corresponds to the denotation of the non-focussed material, while **q** corresponds to the denotation of the focussed material. Note furthermore that they assume a neo-Davidsonian event semantics (see Parsons 1990, Schein

1993, Herburger 2000, and Landman 2000 for discussion), according to which verbs only introduce an event argument directly, while the individual arguments of verbs are introduced via thematic role predicates like *Agent*, *Theme*, etc., and are combined with the predicate denoted by the verb via conjunction.

- (21) $\exists e [\mathbf{p}(e) \wedge \exists e' [e' \leq e \wedge |e'| \geq \frac{1}{2}|e| \wedge \forall e'' [e'' \leq e' \rightarrow \mathbf{q}(e'')]]]$
(op. cit.: 8)

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

Note that $e' \leq e$ means “ e' is a part of e ”, while $|e'| \geq \frac{1}{2}|e|$ means “the cardinality of (the atomic parts of) e' is greater than or equal to half the cardinality of (the atomic parts of) e ”. Nakanishi and Romero assume that a QV-reading “with respect to a given NP arises as a side effect of the following choices” (op. cit.: 9):

- (22) (i) The semantic content and thematic predicate of the NP are within the restrictor \mathbf{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 Nakanishi & Romero (2004), example (20a) above is thus interpreted as given in (23):

- (23) a. $\exists e [*admire(e) \wedge Agent(e, \text{the students}) \wedge \exists e' [e' \leq e \wedge |e'| \geq \frac{1}{2}|e| \wedge \forall e'' [e'' \leq e' \rightarrow Theme(e'', \text{Mary})]]]$ (op. cit.: (31b))
b. “There is a general (possibly plural) event e such that $*admire(e) \wedge Agent(e, \text{the students})$ and there is a (possibly plural) event e' that is a major part of e such that, for all subevents e'' of e' , $Theme(e'', \text{Mary})$ ” (op. cit.: (31c)).

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.

As Nakanishi & Romero (2004) acknowledge themselves, these two assumptions are crucial for the following reason: if \mathbf{q} in the formula above was replaced by an eventuality predicate that contains the NP relative to which the QV-reading arises – i.e. if it was $Agent(e'', the\ students) \wedge Theme(e'', Mary)$ instead of only $Theme(e'', Mary)$ in (23a) – one would not get the desired reading, since the entire sum individual denoted by this NP would stand in the respective thematic relation to each atomic part of the smaller event e'' .

These assumptions are problematic for the following reason: Nakanishi and Romero (2004) do not offer a mapping algorithm that would give us the desired result, and it is not quite clear what such a mechanism would look like. One possibility would be the following: the whole clause minus the Q-adverb is adjoined to the XP dominating the Q-adverb, leaving behind a copy (see Chomsky 1995). In the higher copy the focus-marked constituents are deleted, while in the lower copy the non-focus-marked constituents are deleted. This is similar to the algorithm proposed by Herburger (2000), the only difference being that according to Herburger nothing is deleted in the lower copy, i.e. also non-focal material is repeated there. What is problematic about this algorithm is the fact that it is hard to imagine how the parts of the original clause should be interpreted in a compositional manner. How, for example, should an object like *the students admire* (with *Mary* deleted) be interpreted correctly (i.e. with *the students* as the Agent, not the Theme), and why should the focus-marked DP *Mary* be interpreted as $Theme(e, Mary)$?

This problem could only be avoided if deletion did not apply to syntactic objects at LF, but to the denotations of these objects at the level of semantic interpretation, i.e. if the two copies were both interpreted semantically before the objects corresponding to the focus-/non-focus-marked parts of the original sentence get deleted. This, however, is a dubious assumption, as deletion is normally conceived of as a syntactic operation.

Despite these problems, which are specific to this particular implementation, the underlying ideas of the mechanism just outlined can be applied to our problem concerning the interpretation of sentences with plural definites. We propose that QVEs in sentences with

plural definites come about as indirect effects of a quantification over the salient parts of complex situations. In the next section we develop an approach that avoids the problems mentioned above and can be applied in the context of sentences that contain frequency adverbs like *usually*.

3.2 An Extension of Nakanishi and Romero (2004)

Let us assume that frequency adverbs like *usually* can also quantify over the parts of complex situations, if there is a natural way to identify these parts. This means that such Q-adverbs have to come in two (albeit systematically related) varieties: in order to account for the QV-readings of sentences with singular indefinites and singular definites (and also co-varying plural definites; see section 2.2), 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. But in light of the fact that sentences containing non-covarying plural definites get QV-readings, too, a second, closely related meaning of the respective Q-adverb has to be available.

This second meaning is modelled after the denotation Nakanishi and Romero (2004) assume for the Q-adverb *for the most part*. It introduces two existential quantifiers over (complex) situations, and establishes a relation between the parts those situations can naturally be decomposed into: the cardinalities of the sets containing these parts have to stand in the respective relation. But now the crucial question is how to determine the two complex situations that are related this way, i.e. which part of the (denotation of the) original clause is predicated of the first one, and which part is predicated of the second one?

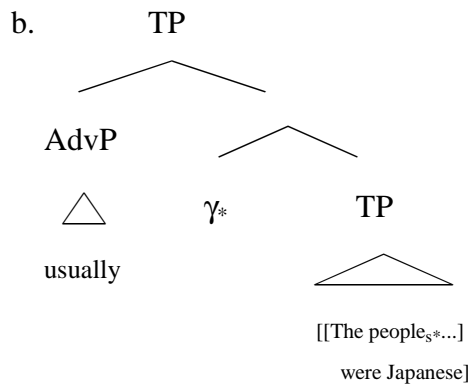
In order to avoid the problems of Nakanishi and Romero's (2004) analysis mentioned above, we stick to the basic mechanism introduced in sections 2.1 and 2.2, where adverbially quantified sentences with singular indefinites and definite were discussed. Its main features are repeated below:

- Q-adverbs adjoin to TP at LF, taking the denotation of the TP-segment they c-command as their nuclear scope.
- The restrictor initially consists of a free variable ranging over situation predicates that is either resolved on the basis of contextual information or (in the absence of such information) on the basis of focus marking.

- Non-focal DPs are accordingly interpreted in the restrictor of the Q-adverb by default.

Consider our familiar example (12b) again, repeated below as (24a), a simplified LF representation of which is given in (24b).

(24) a. The people who lectured at the conference last summer were usually JapaNESE.



Let us first turn to the interpretation of the Q-adverb *usually*: it comes in two closely related versions (given in (25a, b)), of which the second is relevant in the present context.

$$(25) \text{ a. } [[\text{usually-1}_C]]^g = \lambda P_{\langle s, t \rangle}. | \{s: \min(s, \lambda s_1. g(C)(s_1))\} \\ \cap \{s_2: \exists s_3 [s_2 \leq s_3 \wedge \min(s_3, \lambda s_4. g(C)(s_4) \wedge P(s_4))]\} | \\ > 1/2 | \{s: \min(s, \lambda s_1. g(C)(s_1))\} |$$

$$\text{b. } [[\text{usually-2}_C]]^g = \lambda P_{\langle s, t \rangle}. \exists s [g(C)(s) \wedge \exists s_1 \leq s [|s_1| > 1/2 |s| \wedge P(s_1)]]$$

where $|s_I|$ and $|s|$ are abbreviations for $|Salpart(s_I)|$ and $|Salpart(s)|$ and *Salpart* is a (partial) function that maps a complex situation s onto the set whose members are the parts that s can naturally be decomposed into, i.e. the set consisting of its salient parts.

The conditions under which a situation can be decomposed into a set of salient parts will turn out to be crucial for our explanation of contrasts like the ones in (19) above, so we will come back to this point below.

Note that the difference between the two versions of *usually* basically boils down to the question of whether the elements of the two sets that the Q-adverb operates on are defined *directly* via the situation predicates it operates on or *indirectly*. In the first case, each element

of the respective set satisfies the respective situation predicate. In the second case, in contrast, there are two complex situations that satisfy the respective situation predicates, and the sets whose cardinalities the Q-adverb relates are identified on the basis of the fact that their elements are parts of these complex situations. This means that the second version of a given Q-adverb can only be employed if the respective situation predicates characterize situations that can naturally be decomposed into parts. As we will see below, in the case under discussion, this is possible because the relative clause predicate as well as the matrix predicate most naturally receive a distributive interpretation. This makes it possible that the sets of situations whose cardinalities are related stand in a 1:1-relation to the atomic parts of the respective sum individuals, thus enabling the sentence to receive a QV-reading.

Consider next the situation predicate that the free variable in the restrictor of the Q-adverb is resolved to. As already said, we assume the plural definites in the examples under discussion to correspond to the non-focal part of the respective sentence. Consequently, the situation predicate given in (26) functions as the restrictor of the Q-adverb in (24a).

$$(26) \quad \lambda s. \text{in}(\sigma\{x: \text{human}(x)(g(s^*)) \wedge \exists s_1[\text{lecture}(x)(s) \wedge \text{at}(\text{the c. last summer})(s_1) \wedge \tau(s_1) < t_0]\})(s)$$

where τ is a function mapping situations onto their temporal location, $<$ stands for temporal precedence and t_0 is the utterance time.

Let us turn to the denotation of the TP-segment c-commanded by *usually*. Since the definite DP occurring there is c-commanded by *usually*, the free situation variable s^* contained within it can be turned into a variable bound by this Q-adverb by inserting the situation variable binding operator (whose definition is given in (17), section 2.2) directly beneath the Q-adverb. The TP-segment is accordingly interpreted as given in (27):

$$(27) \quad [[\text{The people who lectured at the conference last summer were Japanese}]]^g = \\ \lambda s. \text{Japanese}(\sigma\{x: \text{human}(x)(s) \wedge \exists s_1[\text{lecture}(x)(s_1) \wedge \text{at}(\text{the c. last summer})(s_1) \\ \wedge \tau(s_1) < t_0]\})(s)$$

As already mentioned, the matrix predicate *be Japanese* has to be interpreted distributively if it is applied to a sum individual, and in the case of the relative clause predicate *lecture* this is at least the preferred option, as lectures are normally given by single persons. Concerning the

last point, the availability of a QV-reading crucially depends on the hearer's willingness to make the default assumption that the relative clause predicate is interpreted distributively (as already mentioned in footnote 1), i.e. that each of the persons mentioned gives exactly one lecture. Why this is so will become clear in the next two sections, where we argue that the sets of situations whose cardinalities the Q-adverb relates are determined via the parts into which the relative clause situation can naturally be decomposed.

Let us assume for concreteness that both the relative clause and the matrix predicates are shifted via a distributivity-operator⁷ that applies to them, as shown in (28a, b) (cf. Lasersohn 1998, who builds on Link 1983, 1987):

- (28) a. $\text{DIST}(\lambda x \lambda s. \text{lecture}(x)(s) \wedge \tau(s) < t_0) =$
 $\lambda x \lambda s. \forall y \in \text{Atom}(x): \exists s_1 \leq s. \text{lecture}(y)(s_1) \wedge \tau(s_1) < t_0$
- b. $\text{DIST}(\lambda x \lambda s. \text{Japanese}(x)(s) \wedge \tau(s) < t_0) =$
 $\lambda x \lambda s. \forall y \in \text{Atom}(x): \exists s_1 \leq s. \text{Japanese}(y)(s_1) \wedge \tau(s_1) < t_0$

This has the consequence that the situation predicate in the restrictor of the Q-adverb is actually spelled out as given in (29a) below, while the one in the nuclear scope is spelled out as given in (29b):

- (29) a. $\lambda s. \text{in}(\sigma\{x: \text{human}(x)(w_0) \wedge \exists s_1 [\forall y \in \text{Atom}(x): \exists s_2 \leq s_1. \text{lecture}(y)(s_2) \wedge \tau(s_2) < t_0 \wedge \text{at}(\text{the c. last summer})(s_1)]\})(s)$
- b. $\lambda s. \forall y \in \text{Atom}(\sigma\{x: \text{human}(x)(s) \wedge \exists s_1 [\forall y \in \text{Atom}(x): \exists s_2 \leq s_1. \text{lecture}(y)(s_2) \wedge \tau(s_2) < t_0 \wedge \text{at}(\text{the c. last summer})(s_1)]\}): \exists s_3 \leq s. \text{Japanese}(y)(s_3) \wedge \tau(s_3) < t_0$

The final step now consists in combining the denotation of *usually-2* given in (25b) above with the two situation predicates in (29). This gives us (30a), which can be simplified to (30b):

⁷ For concreteness, let us assume that the distributivity-operator is adjoined to the constituents (i.e. the VPs) that denote the respective objects.

- (30) a. $\exists s$ [$\text{in}(\sigma\{x: \text{human}(x)(w_0) \wedge \exists s_1[\forall y \in \text{Atom}(x): \exists s_2 \leq s_1. \text{lecture}(y)(s_2) \wedge \tau(s_2) < t_0 \wedge \text{at}(\text{the c. last summer})(s_1)]\})(s) \wedge$
 $\exists s_3 \leq s$ [$|s_3| > \frac{1}{2}|s| \wedge$
 $\forall y \in \text{Atom}(\sigma\{x: \text{human}(x)(s_3) \wedge$
 $\exists s_4[\forall y \in \text{Atom}(x):$
 $\exists s_5 \leq s_4. \text{lecture}(y)(s_5) \wedge \tau(s_5) < t_0 \wedge$
 $\text{at}(\text{the c. last summer})(s_4)]\}):$
 $\exists s_6 \leq s_3. \text{Japanese}(y)(s_6) \wedge \tau(s_6) < t_0$]]
- b. $\exists s$ [$\text{in}(\sigma\{x: \text{human}(x)(w_0) \wedge \exists s_1[\text{DIST}(\text{lecture}(x)(s_1) \wedge \tau(s_1) < t_0) \wedge$
 $\text{at}(\text{the c. last summer})(s_1)]\})(s)$
 $\wedge \exists s_2 \leq s$ [$|s_2| > \frac{1}{2}|s| \wedge \text{DIST}(\text{Japanese}(\sigma\{x: \text{human}(x)(s_2) \wedge \dots\})(s_2)$
 $\wedge \tau(s_2) < t_0)$]]

Simplifying somewhat, this can be paraphrased as:

‘There is a situation s that contains the (maximal) sum of people who lectured at the conference last summer, and there is a situation s_2 that is a part of s such that

- (a) the cardinality of the salient parts of s_2 is more than half the cardinality of the salient parts of s and
- (b) s_2 is a situation where the sum of people lecturing at the conference last summer that is maximal with respect to s_2 is Japanese’.

Note that the problem with Nakanishi and Romero’s (2004) analysis discussed in the last section is circumvented in our formalization. Recall that Nakanishi and Romero had to assume that the original event predicate (i.e. the denotation of the whole clause minus the Q-adverb) is split up in the following way: the focal part is predicated of the “smaller” event e' , while the non-focal part is predicated of the larger eventuality e . This was necessary in order to keep the (non-focal) definite DP from being repeated in the event predicate that is applied to e' , since this would prevent the respective sentence from getting a QV-reading. The problem with this assumption, however, is that it is unclear how the required split can be achieved in a compositional manner.

In our formalization this problem does not arise: The situation variable contained within the definite DP that is interpreted in the nuclear scope of the Q-adverb is turned into a variable that is bound by the existential quantifier introducing the smaller nucleus situation s_2 . Consequently, only the larger restrictor situation s contains the maximal sum of individuals

that satisfy the NP-predicate in the actual world, while the nucleus situation s_2 only contains the maximal sum of individuals that satisfy this predicate in s_2 . Furthermore, the cardinality of the set of salient parts into which s_2 can be decomposed is required to be more than half the cardinality of the set of salient parts into which s can be decomposed. Now, let us assume for the moment that the cardinality of the respective situations is determined in the way assumed by Nakanishi and Romero (2004), namely by establishing a 1:1-correspondence with the atomic parts of the respective sum individuals (we will see below that things cannot be quite this simple). It is thus clear that the cardinality of the maximal sum individual contained in s_2 is at least more than half the cardinality of the maximal sum individual contained in s . And this yields the QV-reading the sentence actually has.

Returning to the question of how the sets of salient parts into which the respective situations can be decomposed are determined, the assumption made above seems rather obvious: both situations contain sum individuals with atomic parts. They can thus easily be divided into parts that stand in 1:1-correspondence to the atomic parts of the respective sum individuals, as in Nakanishi and Romero's (2004) analysis of sentences with *for the most part*. This, however, cannot account for the fact that sentences like (8a) and (9a), which are repeated below as (31a, b) are infelicitous. We explain this via the *tense agreement constraint* and the *coincidence constraint*, respectively, which were mentioned in section 1: according to the first one, the tense of the relative clause verb has to agree with the tense of the matrix verb, and according to the second one it has to be plausible that the parts of the relative clause situation are temporally distributed. (31a) violates the first constraint, (31b) the second:

- (31) a. * The people who lectured at the conference last summer are usually JapaNESE.
 b. * The people who listened to Peter's talk at the conference last summer were usually JapaNESE.

We will see in the next two subsections that both constraints can naturally be derived from the following assumptions:

- (a) The sets of situations whose cardinalities the Q-adverb relates are defined via the parts into which the relative clause situation can naturally be decomposed on its distributive interpretation.

(b) The situations quantified over by a Q-adverb need to be located in non-overlapping time intervals.

Concerning (b), Lasersohn (1995) and Zimmermann (2003) have argued that a similar constraint is operative in the interpretation of pluractional elements such as *occasionally*, *again and again*, etc., where it is also required that the respective atomic events/situations do not overlap.⁸ We take these constraints to follow from the fact that situations need to be *individuated*, and since they – in contrast to concrete individuals – often do not come with fixed boundaries, location in distinct, non-overlapping time intervals is a good way to set up boundaries.

Note that as soon as we turn our attention from the quasi-generic cases discussed in section 2 to cases where the situations to be quantified over are located in a specific interval, it becomes obvious that such a constraint is also operative in cases where the first version of the respective frequency adverb has to be employed: (32a) below is only acceptable if the time span during which John lay on the beach can be split into distinct, non-overlapping units. This can be done in two ways: either one assumes that the time spans during which John lay on the beach are separated by time stretches where he did not lie on the beach, or one assumes that the speaker went to the beach on several occasions and saw John lie there each time. In order for the sentence to be *true*, Mary has to be with John on most of these occasions. This is in clear contrast to (32b), which may well be true if John lay on the beach the whole day long, as long as Mary was with him for a time span that covers more than half of the day.

(32) a. Yesterday, John usually lay on the beach with MARY.

b. Yesterday, John for the most part lay on the beach with MARY.

Let us return to sentences where the second version of the respective frequency adverb has to be employed (because what is given is a predicate that characterizes a complex situation that can be decomposed into parts, not a set of situations). There is also evidence that in cases where there is no relative clause modifying a definite DP, the *coincidence constraint* has to be in effect (while no such effect can be observed in sentences with adverbs of quantity):

⁸ In fact, the constraint operative in these cases seems to be even stronger: it is not only required that the atomic events/situations do not overlap, but that they are separated by rather long stretches of time (cf. Lasersohn 1995 and Zimmermann 2003).

- (33) a. Yesterday, Mary kissed a lot of boys at Peter's party. They were usually well DRESSED.
- b. Yesterday, Mary kissed a lot of boys at Peter's party. For the most part, they were well DRESSED.
- c. Yesterday, a lot of people attended Mary's concert. #They were usually well DRESSED.
- d. Yesterday, a lot of people attended Mary's concert. For the most part, they were well DRESSED.

The second sentence in (33a) is fine and receives an interpretation that can be paraphrased as “Most of them (= of the boys kissed by Mary) were well dressed”, i.e. a QV-reading. The second sentence in (33c), in contrast, is rather odd in the context of the first one, and certainly does not receive an interpretation that can be paraphrased as “Most of them (= the people attending Mary's concert) were well dressed”.⁹

Before turning to the difference between (33a) and (33c), let us first say a few words about how the QV-reading of the second sentence in (33a), which contains a pronoun instead of a plural definite, comes about. Following Elbourne (2001, 2005), we take pronouns to be the surface forms of definite DPs that have undergone NP-ellipsis, which is licensed under identity with some immediately preceding NP. Now, in the case of (33a), the elided NP is presumably *boys*. Furthermore, we assume that the situation variable contained within the elided NP is dynamically bound by the existential quantifier that binds the situation variable introduced by the matrix verb of the first sentence.¹⁰ The pronoun in (33a) thus denotes the maximal sum individual consisting of the boys kissed by Mary at the party yesterday, and the

⁹ Note that the sentence becomes much more acceptable if the matrix verb is marked for present tense, as in (i).

(i) Yesterday, a lot of people attended Mary's concert. They are usually well DRESSED.

But in this case the sentence receives an entirely different interpretation, where the Q-adverb is interpreted in the scope of the distributivity-operator. This reading can be paraphrased as “Each of them (= the people who attended Mary's concert) is well dressed on most relevant occasions”. Because this is a quasi-habitual interpretation, we assume that its availability depends on the present tense marking of the matrix verb (at least as long as the context does not make salient a past interval during which the respective habit can be assumed to hold), which explains why it is blocked in the case of (33b).

¹⁰ See Staudacher 1987, Groenendijk and Stokhof 1990 and Chierchia 1995b for a detailed discussion of the principles of dynamic binding.

QV-reading of the second sentence can be accounted for in the way by now familiar from the preceding discussion, as shown in (38):¹¹

$$(34) \quad \begin{aligned} & \exists s[\text{at}(\text{the party yesterday})(s) \wedge \\ & \quad \wedge \exists x[\text{boys}(x)(w_0) \wedge |x| \geq n \wedge \\ & \quad \quad \forall y \in \text{Atom}(x): \exists s_1 \leq s. \text{kiss}(y)(\text{Mary})(s_1) \wedge \tau(s_1) < t_0] \wedge \\ & \quad \wedge \exists s_2 [\text{in}(\sigma\{z: \text{boys}(z)(s)\})(s_2) \wedge \\ & \quad \quad \wedge \exists s_3 \leq s_2 [|s_3| > \frac{1}{2}|s_2| \wedge \forall k \in \text{Atom}(\sigma\{z: \text{boys}(z)(s)\}): \\ & \quad \quad \quad \exists s_4 \leq s_3. \text{well-dressed}(k)(s_4) \wedge \tau(s_4) < t_0]]]] \end{aligned}$$

where n is a number counting as large in the relevant context.

Returning to the difference between (33a) and (33c), intuitively it is clear what is at issue: in the case of (33a), the first sentence introduces a complex situation consisting of smaller situations whose running times do not overlap – namely the single kissing situations (as one normally kisses one person a time). In the case of (33c), in contrast, the first sentence introduces a complex situation consisting of smaller situations whose running times have to be assumed to overlap, as attending a concert means being present from start to finish.

This shows that the internal constitution of the situation introduced by the first sentence has a direct influence on the acceptability of the second sentence – similar to cases like (31b), where the internal constitution of the situation introduced by the relative clause modifying the definite DP in subject position determines the acceptability of the matrix clause. We will show that in both cases this is due to the fact that the running times of the respective situations constitute the most specific locally available temporal information.

3.3 Locating Situations in Time

In the last section, we have seen how the fact that sentences with plural definites receive QV-readings can be explained in principle: The free variable in the restrictor of the Q-adverb is resolved to a situation predicate that is determined on the basis of a (non-focal) definite DP's denotation, while the situation predicate denoted by the TP-segment that the Q-adverb c-commands at LF functions as the nuclear scope. The Q-adverb then relates the cardinalities of the sets of situations into which the two complex situations can naturally be decomposed. A

¹¹ Note that according to the principles of dynamic binding, two consecutive sentences are conjoined via dynamic conjunction by default, as a consequence of which variables contained within the second sentence can be bound dynamically by existential quantifiers that are contained within the first sentence.

QV-reading is thus only available if there is a natural way to decompose the respective situations into countable units.

Now, in the case of the nucleus situation, a distributive interpretation of the matrix predicate makes available such units in an obvious way. In the case of the restrictor situation, in contrast, which is determined solely on the basis of its containing the maximal sum individual denoted by the respective definite DP, the internal constitution of the sum individual is the only clue for constructing the required set. Nevertheless, we have seen that it does not seem to be enough to construct a set of situations such that each of these situations contains exactly one atomic part of the respective sum individual. Rather, what seems to be required is that the running times of the respective situations do not overlap. That no such overlap occurs, in turn, has to be determined on the basis of locally available information, which may either come from the relative clause modifying the respective definite DP, or from an immediately preceding clause. If no such information is available, world knowledge is the decisive factor, as evidenced by the contrast between (35a) and (35b):

- (35) a. Peter's girlfriends are usually CaNAdian.
 b. * Peter's cousins are usually CaNAdian.
 c. For the most part, Peter's cousins are CaNAdian.
 d. Most of Peter's cousins are CaNAdian.

Note that the oddity of (35b) is not simply due to the set of Peter's cousins being too small a domain to quantify over, as (35c, d) are both perfectly acceptable. Rather, what seems to make the difference is that in the case of (35a) there is a natural way to distribute the atoms of the sum individual denoted by the subject DP over a set of temporally non-overlapping situations, while in the case of (35b) this is not the case: it is plausible to assume that Peter has one girlfriend a time, but it would be quite unnatural to assume that he has only one cousin at a time. After all, this would only be possible if (with the exception of his first cousin) no cousin of Peter is born before another cousin has died, since having a cousin – in contrast to having a girlfriend – is a property one only ceases to have if the respective individual has died. Before turning to a formal implementation of the constraint against

situations with overlapping running times, let us first turn to the mechanism by which locally available linguistic information is made use of.

We follow Lenci and Bertinetto (1999) in assuming that the situations quantified over by a Q-adverb always have to be located in time. More concretely, we assume that they have to be located within the most salient interval that is made available by the (linguistic or extralinguistic) context – namely the running time of another situation that is uniquely characterized by some predicate, where this predicate is provided by the (linguistic or extralinguistic) context. Technically, this is achieved by intersecting the situation predicate characterizing the restrictor situation of the respective Q-adverb with the predicate $\lambda s. \tau(s) \subseteq \tau(\sigma\{s':Q(s')\})$, where Q is a free variable ranging over situation predicates. The denotation of a Q-adverb like *usually* (in its second variant¹²) thus has to be altered slightly, as shown in (36):

$$(36) \text{ [[usually-2_c]]}^{\text{g}} = \lambda P_{\langle s, t \rangle}. \exists s [g(C)(s) \wedge \tau(s) \subseteq \tau(\sigma\{s':Q(s')\}) \wedge \exists s_1 \leq s [|s_1| > \frac{1}{2} |s| \wedge P(s_1)]]$$

Now recall that at the end of section 3.2, we have discussed cases like (33a, c), where the internal temporal constitution of a complex situation introduced by the immediately preceding sentence seems to determine the internal temporal constitution of the situation functioning as the restrictor of a Q-adverb. For this to be possible, the running time of the restrictor situation has to be located within the running time of the situation introduced by the immediately preceding sentence. Concerning the latter point, we can now see this as a consequence of the fact that the running time of the situation introduced by the immediately preceding sentence counts as the most salient interval made available by the context: Q therefore has to be resolved to a predicate characterizing this situation in such a way that applying the σ -operator to it yields the intended result.

A predicate such as $\lambda s. \exists x [\textit{boy}(x)(w_0) \wedge \textit{kiss}(x)(\textit{Mary})(s) \wedge \textit{at}(\textit{the party yesterday})(s)]$ would do the job and the sequence in (33a) (repeated here as (37a)) is interpreted as given in (37b) (the relevant parts are given in boldface).

¹² Of course, we assume that the denotation of the respective first variant has to be altered analogously. As argued for in detail in Endriss and Hinterwimmer (2007), the assumption that situations quantified over by a Q-adverb need to be located within contextually salient intervals makes it possible to account for tense agreement effects in adverbially quantified sentences containing indefinites modified by relative clauses.

(37) a. Yesterday, Mary kissed a lot of boys at Peter's party. They were usually well DRESSED.

$$\begin{aligned}
 \text{b. } & \exists s [\text{at}(\text{Peter's party yesterday})(s) \wedge \exists x [\text{boy}(x)(w_0) \wedge |x| \geq n \wedge \\
 & \quad \forall y \in \text{Atom}(x): \\
 & \quad \quad \exists s_1 \leq s. \text{kiss}(y)(\text{Mary})(s_1) \wedge \tau(s_1) < t_0 \wedge \\
 & \quad \exists s_2 [\text{in}(\sigma\{z: \text{boy}(z)(s)\})(s_2) \wedge \\
 & \quad \quad \tau(s_2) \subseteq \tau(\sigma\{s': \exists x [\text{boy}(x)(w_0) \wedge \text{kiss}(x)(\text{Mary})(s') \wedge \text{at}(\text{Ppy})(s')\})] \wedge \\
 & \quad \quad \exists s_3 \leq s_2 [|s_3| > \frac{1}{2} |s_2| \wedge \forall k \in \text{Atom}(\sigma\{z: \text{boy}(z)(s_3)\}): \\
 & \quad \quad \quad \exists s_4 \leq s_3. \text{well dressed}(k)(s_4) \wedge \tau(s_4) < t_0]]]]
 \end{aligned}$$

Locating the restrictor situation s_2 within the running time of the situation introduced by the preceding sentence is unproblematic, since the parts of s are temporally distributed. As we will see in detail in section 3.4, this has the consequence that the parts of s_2 are temporally distributed as well. We are now equipped to account for the oddity of our initial examples. Consider (7a) first, which is repeated here as (38):

(38) The people who lectured at the conference last summer were usually JapaNESE.

In this case, an even more salient interval (because of greater local proximity) is available where the running time of the restrictor situation can be located: namely the running time of the (maximal) lecturing-situation whose existence is entailed by the relative clause modifying the definite DP in the restrictor. The free variable Q is therefore resolved to a suitable predicate such as $\lambda s. \exists x [\text{human}(x)(w_0) \wedge \text{lecture}(x)(s) \wedge \text{at}(\text{the conference last summer})(s)]$. The sentence is interpreted as given (in simplified form) in (39) accordingly:

$$\begin{aligned}
 (39) \quad & \exists s [\text{in}(\sigma\{x: \text{human}(x)(w_0) \\
 & \quad \wedge \exists s_1 [\text{DIST}(\text{lecture}(x)(s_1) \wedge \tau(s_1) < t_0) \wedge \text{at}(\text{the c. last summer})(s_1)]])(s) \wedge \\
 & \quad \tau(s) \subseteq \tau(\sigma\{s': \exists x [\text{human}(x)(w_0) \wedge \text{lecture}(x)(s') \wedge \text{at}(\text{cls})(s')\})] \wedge \\
 & \quad \exists s_2 \leq s [|s_2| > \frac{1}{2} |s| \wedge \text{DIST}(\text{Japanese}(\sigma\{x: \text{human}(x)(s_2) \wedge \dots \}))(s_2) \wedge \\
 & \quad \quad \quad \tau(s_2) < t_0]]]
 \end{aligned}$$

(39) is fine, too, as the parts of s_1 , within whose running time the restrictor situation s is located, are temporally distributed. Furthermore, there is no contradiction between the temporal specification of the restrictor situation, and the temporal specification of the nucleus situation, which comes from the tense marking of the matrix verb.

Let us turn to the infelicitous example (8a) next, which is repeated here as (40):

(40) *The people who lectured at the conference last summer are usually JapANESE.

In this case, too, the running time of the relative clause situation counts as the most salient interval, and the sentence is interpreted as given in (41):

(41) $\exists s$ [in($\sigma\{x: \text{human}(x)(w_0) \wedge$
 $\wedge \exists s_1[\text{DIST}(\text{lecture}(x)(s_1) \wedge \tau(s_1) < t_0) \wedge \text{at}(\text{the c. last summer})(s_1)]\})\}) (s) \wedge$
 $\wedge \tau(s) \subseteq \tau(\sigma\{s': \exists x[\text{human}(x)(w_0) \wedge \text{lecture}(x)(s') \wedge \text{at}(\text{c.l.s})(s')]\}) \wedge$
 $\wedge \exists s_2 \leq s$ [$|s_2| > \frac{1}{2}|s| \wedge \text{DIST}(\text{Japanese}(\sigma\{x: \text{human}(x)(s_2) \wedge \dots\})(s_2) \wedge$
 $\wedge t_0 \subseteq \tau(s_2))$]]

Since the two sentences (38) and (40) only differ with respect to the tense marking of the respective matrix verb, the only difference between the corresponding semantic representations (39) and (41) are the conditions imposed on the temporal location of the salient parts of the respective nucleus situations: in the case of (39), their running times have to precede the time of utterance, while in the case of (41) the time of utterance has to be included within their running times.

While the first condition is unproblematic, the second one leads to a necessary contradiction: on the one hand, the restrictor situation s has to be located within the temporal trace of a situation s_1 that took place before the utterance time. On the other hand, there has to be a part s_2 of s such that s_2 consists of smaller situations whose temporal traces include the speech time. Consequently, the temporal trace of s_2 would include the speech time as well. (41) can never be true, as it is impossible that there is a situation that took place before the speech time as a whole, but has a part that includes the speech time.

We thus have an account for the oddity of examples like (40), where the tense marking of the relative clause verb differs from the tense marking of the matrix verb: the fact that the restrictor situation has to be located in an interval that is determined on the basis of the most salient information available necessarily leads to a contradiction. We take this as evidence that frequency adverbs exclusively quantify over situations in sentences with plural definites – especially in light of the fact that comparable effects are entirely absent in the case of similar examples with quantificational DPs and adverbs of quantity like *for the most part*, which we assume to have other quantificational domains accordingly.

In the next section we turn to a formal implementation of the coincidence constraint, which also sets sentences containing frequency adverbs apart from sentences with quantificational DPs as well as from ones containing adverbs of quantity.

3.4 The Coincidence Constraint

Let us return to our familiar example (9a), which is repeated here as (42):

- (42) *The people who listened to Peter's talk at the conference last summer were usually JapaNESE.

Recall that we have already arrived at an informal characterization of what goes wrong in this example in sections 3.2 and 3.3: the complex restrictor situation, which contains the sum individual denoted by the definite DP, needs to be decomposed into countable units on the basis of locally available information or (in the absence of such information) world knowledge. In the case at hand, information of the required kind is provided by the relative clause situation: due to its distributive interpretation, it makes available a set of situations, each of which contains exactly one atomic part of the sum individual denoted by the definite DP. Because of its salience, this information cannot be ignored, which leads to the following problem: Q-adverbs are only allowed to operate on sets of situations whose running times do not overlap. It is, however, clear that the salient parts of the relative clause situation in (42) violate this constraint, due to the following facts: first, the definiteness of the DP *Peter's talk* requires that everyone listened to the same talk. Second, if one listens to a talk, one normally listens to it from start to finish. Therefore, the salient parts of the relative clause situation all coincide temporally. Since the parts of the restrictor situation are determined on the basis of the internal constitution of this situation, they all coincide temporally, too. In the case of the minimally contrasting example (38) discussed above, this is different. There, the temporal traces of the smaller situations that the relative clause situation consists of do not have to coincide: the talks given at a conference are normally distributed over the whole duration of the conference.

The analysis developed in section 3.3 enables us to formally implement these assumptions: 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 salient

parts, it is natural to assume that the salient parts of the restrictor situation are located within the salient parts of the relative clause situation. i.e. for each salient part s_1 of the former there has to be a salient part s_2 of the latter such that the running time of s_1 is contained within the running time of s_2 . This is based on the following consideration: 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 salient parts of s . This is given more formally in (43):

$$(43) \quad \tau(s) := \\ \text{tt. } \forall s_1 [s_1 \in \text{Salpart}(s) \rightarrow \tau(s_1) \subseteq t] \wedge \forall t_1 [\forall s_2 [s_2 \in \text{Salpart}(s) \rightarrow \tau(s_2) \subseteq t_1] \rightarrow t \subseteq t_1] \\ \text{where } s \text{ is a complex situation.}$$

Note that $\tau(s)$ in the formula above is understood to be discontinuous if the salient parts 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 salient parts.

We now assume that the temporal trace of a complex situation s is included in the temporal trace of another complex situation s_1 if the smallest (discontinuous) interval that includes the temporal traces of the salient parts of s is included in the smallest (discontinuous) interval that includes the temporal traces of all salient parts of s_1 . At this point, it becomes relevant that the interval denoting the temporal trace of a complex situation is understood to be discontinuous if the temporal traces of the salient parts this complex situation consists of are temporally distributed: this has the consequence that for each salient part s_2 of a complex situation s such that the temporal trace of s is included within the temporal trace of a complex situation s_1 there has to be a corresponding salient part s_3 of s_1 such that the temporal trace of s_2 is included in the temporal trace of s_3 . This is given more formally in (44):

$$(44) \quad \tau(s) \subseteq \tau(s_1) := \\ \forall s_2 [s_2 \in \text{Salpart}(s) \rightarrow \exists s_3 [s_3 \in \text{Salpart}(s_1) \wedge \tau(s_2) \subseteq \tau(s_3)]] \\ \text{where } s \text{ and } s_1 \text{ are both complex situations.}$$

Recall that in the sentences under discussion the restrictor situation is specified as being a situation that contains the sum individual denoted by the definite DP. By hypothesis, each salient part of the restrictor situation has to be a situation that contains an atomic part of this

sum individual.¹³ Moreover, since – also by hypothesis – the running times of all salient parts of the relative clause situation coincide temporally, all salient parts of the restrictor situation coincide temporally, too.

We now need to make the constraint against situations with overlapping running times part of the denotation of the respective Q-adverbs, in order to derive the oddity of examples like (42). This is done in (45), where the condition that the salient parts of the restrictor situation may not have overlapping running times is added to the denotation of *usually*-2.¹⁴ (45) is thus the final denotation we assume for *usually*₂.

$$(45) \quad [[\text{usually-2}_C]]^g = \lambda P_{\langle s, t \rangle}. \exists s [g(C)(s) \wedge \tau(s) \subseteq \tau(\sigma\{s': Q(s')\}) \wedge \\ \forall s_2, s_3 \in \text{Salpart}(s) [s_2 \neq s_3 \rightarrow \neg[\tau(s_2) \circ \tau(s_3)]] \wedge \\ \exists s_1 \leq s [|s_1| > \frac{1}{2} |s| \wedge P(s_1)]]$$

where *o* means *overlaps*.

Consider now the interpretation we derive for (42) (which is repeated here as (46a)) according to our assumptions:

- (46) a. *The people who listened to Peter's lecture at the conference last summer were usually JapaNESE.
- b. $\exists s [in(\sigma\{x: \text{human}(x)(w_0) \wedge \\ \exists s_1 [DIST(\text{listen}(P.s l.)(x)(s_1) \wedge \tau(s_1) < t_0) \wedge \text{at}(c. l. s.)(s_1)]\})(s) \wedge \\ \tau(s) \subseteq \tau(\sigma\{s': \exists x [\text{human}(x)(w_0) \wedge \text{listen}(P.s l.)(x)(s') \wedge \text{at}(c.l.s)(s')\}]) \wedge \\ \forall s_3, s_4 \in \text{Salpart}(s) [s_3 \neq s_4 \rightarrow \neg[\tau(s_3) \circ \tau(s_4)]] \wedge \\ \wedge \exists s_2 \leq s [|s_2| > \frac{1}{2} |s| \wedge DIST(\text{Japanese}(\sigma\{x: \text{human}(x)(s_2) \wedge \dots \})(s_2) \wedge \\ \tau(s_2) < t_0)]]$

The unacceptability of (46a) is an automatic consequence of (45) above: because it is highly salient, the temporal trace of the restrictor situation *s*, which is a situation that includes all the

¹³ Now note that there is no way to define a proper part of a situation that is just characterized by its containing a certain individual. Such a situation would always comprise the entire interval within which it is located. Therefore, if no other interval is made available by the context, the most natural assumption is that the respective situation comprises the whole lifetime of the respective individual.

¹⁴ This is probably too strong, as a sentence like (38) intuitively does not seem to require that there is no temporal overlap at all between the lectures mentioned there in order to be acceptable. Rather, what seems to be required is the condition that for a substantial proportion of the respective situations it is the case that their temporal traces do not overlap. We have, however, employed the condition in (45) in order to keep things simpler, as this is sufficient for our present purposes.

people who listened to Peter's talk at the conference last summer, has to be included in the temporal trace of the relative clause situation s_I , which is the situation of these people listening to Peter's talk. This has the consequence that for each salient part of s that includes one of these people there has to be a corresponding listening situation which is a salient part of s_I , such that the temporal trace of the first is located within the temporal trace of the second (see the discussion above). Therefore, if the temporal traces of all salient parts of s_I overlap considerably – as it is the case with people listening to a talk from start to finish – it will also necessarily be the case that all salient parts of s overlap considerably. This, however, makes the sentence necessarily contradictory, as it is explicitly stated that the running times of the salient parts of s do not overlap.¹⁵ In the case of examples like (38), in contrast, the fact that the salient parts of the restrictor situation are located within the running times of the salient parts of the relative clause situation does not necessarily lead to a contradiction: it is quite natural to assume that the single lectures given during the conference mentioned do not temporally coincide (recall that the sentence only receives a QV-reading under the condition that this is taken for granted).

We now have an account that not only explains the oddity of examples like (46a), where the internal constitution of the relative clause situation directly determines the acceptability of the matrix sentence, but also of examples like (33c) (repeated here as (47a)) and (35b) (repeated here as (47b)): in each case, the sentences are necessarily contradictory because it is clear that the salient parts of the restrictor situation have overlapping running times – either because of salient linguistic information or because of world knowledge.

- (47) a. Yesterday, a lot of people attended Mary's concert. #They were usually well DRESSED.
- b. * Peter's cousins are usually CaNAdian.

¹⁵ Alternatively, it would also be possible to make the ban against overlapping situations a presupposition of frequency adverbs like *usually*. The oddity of examples like (46a) would then be due to a presupposition violation. The problem with such an account is, however, that the information that would lead to the presupposition violation is derived on the basis of a pragmatic process that determines a value for the free interval variable, which is also part of the meaning of the Q-adverb. The standard view on presuppositions is, however, that their satisfaction is a precondition for the computation of the truth conditions of the respective expression, i.e. they would have to be checked *before* the computation of the truth conditional content starts, not *afterwards*, as the account under discussion would entail. We therefore stick to the alternative pursued in the main text for our present purposes.

Let us end this section by citing two additional examples that support our analysis. (48) is only acceptable if it is interpreted in a specific way, namely if one is willing to assume that Peter did not meet all of his colleagues at the same time, but during the course of the afternoon:

(48) The people Peter met yesterday afternoon were usually colleagues of his.

Finally, as noted by Nakanishi and Romero (2004), sentence (49a) below (their example (52a)) is unacceptable, while the minimally varying (49b), where *usually* has been replaced by *for the most part* is fine. In this case, too, it is natural to assume that the unacceptability of the variant with *usually* is due to the fact that all salient parts of the relative clause situation necessarily coincide temporally – due to the progressive aspect on the verb.¹⁶

- (49) a. *The students sitting over there now are usually smart.
 b. For the most part, the students sitting over there now are smart.

4 Conclusion and Outlook

In this paper we have discussed QVEs in sentences containing plural definites. We have argued that frequency adverbs like *usually* unambiguously quantify over situations – either over the elements of a set of situations (in the case of sentences with singular indefinites), or over the salient parts of a complex situation (in the case of sentences with plural definites). This conclusion was based on the fact that sentences containing frequency adverbs behave differently from sentences containing quantificational DPs and adverbs of quantity with respect to two newly observed constraints: the tense agreement constraint, and the

¹⁶ In their brief discussion, Nakanishi and Romero (2004) speculate that the unacceptability of (49a) is due to the fact that Q-adverbs like *usually* may only quantify over generic situations that satisfy the respective predicate. This is based on the observation that (i) below, where the relative clause verb is marked for generic tense, is fine.

- (i) The students who sit over there are usually smart
 (Nakanishi and Romero (2004): ex. (51a)).

This explanation, however, does not cover the acceptable cases discussed above, where surely no generic tense is involved. Note furthermore that example (i) is presumably best analyzed in the way discussed in section 2.2, i.e. as a case where the denotation of the definite DP varies with the situations quantified over.

coincidence constraint. While sentences of the former type have to obey these constraints in order to be fully acceptable, this is not the case for sentences of the latter type. We have argued that both constraints concern the temporal location of situations, and that the contrast between sentences containing frequency adverbs, on the one hand, and sentences containing quantificational DPs and adverbs of quantity, on the other, shows that while in the former quantification over situations is always involved, quantification over individuals is an option in the latter.

As already mentioned, the assumption that adverbs of quantity do not have to quantify over (the salient parts of complex) situations is at odds with Nakanishi and Romero's (2004) assumptions, on whose analysis of sentences containing plural definites and adverbs of quantity like *for the most part* our own analysis of sentences containing plural definites and frequency adverbs like *usually* is based. Nakanishi and Romero's assumption that QV-readings of sentences with plural definites come about as indirect effects of quantification over (the salient parts of sum) eventualities rather than as direct effects of quantification over (the atomic parts of sum) individuals is based on the following observation: sentences combining plural definites and the adverb of quantity *for the most part* behave differently from sentences containing quantificational DPs headed by *most* with respect to the availability of distributive readings. More concretely, while the latter allow collective readings with accomplishment and activity verbs (but not with states and achievements), as shown in (50a, b) below, the former never allow collective readings, as shown in (50c, d).

- (50) a. Most of the boys lifted the piano together.
b. Most of the boys built a raft together.
c. #For the most part, the boys lifted the piano together.
d. #For the most part, the boys built a raft together.

From this Nakanishi and Romero conclude that the quantificational domains differ in the two cases, and that quantification over (the atomic parts of sum) eventualities is directly associated with distributivity, while in the case of quantification over individuals there is more flexibility.

There is thus a tension between the empirical facts supporting our assumption that adverbs of quantity and quantificational DPs can both quantify over individuals and the empirical facts supporting Nakanishi and Romero's assumption that they have different quantificational domains. In principle, this tension can be resolved by taking the tense agreement constraint and the coincidence constraint to be operative only with frequency adverbs and not assuming that these constraints follow from the need to individuate the situations quantified over on the basis of their temporal location. Both analyses could then coexist peacefully, as the fact that sentences with adverbs of quantity neither obey the coincidence constraint nor the tense agreement constraint would no longer show that no quantification over situations/eventualities is involved. The fact that sentences combining adverbs of quantity and plural definites behave differently from sentences with corresponding quantificational DPs with respect to the availability of distributive readings would thus not show that the quantificational domains differ, but rather that the precise lexical semantics is different in the two cases.

However, since it is very plausible that the tense agreement constraint as well as the coincidence constraint follow from the need to individuate the situations quantified over on the basis of their temporal location, we consider this strategy at least worth pursuing. This would mean, however, that Nakanishi and Romero's analysis of *for the most part* cannot be maintained, and the facts discussed by them as support for their analysis have to be explained in some other way. In Endriss and Hinterwimmer (in preparation), we therefore argue (based on additional data) that adverbs of quantity like *for the most part* are topic sensitive quantifiers that can take objects of any kind as their arguments, as long as these objects can naturally be decomposed into parts (cf. Lahiri 2002). Furthermore, we show that by building distributivity directly into the meaning of these quantifiers, the facts discussed by Nakanishi and Romero can be explained without having to assume that adverbs of quantity necessarily quantify over situations/events, thus allowing these quantifiers to operate directly over the atomic parts of plural individuals in sentences with plural definites.

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