Pluractionality and Complex Quantifier Formation*

Abstract

This paper investigates the effects of (surface) DP-internal quantifying expressions on semantic interpretation. In particular, I investigate two syntactic constructions in which an adjective takes scope out its embedding DP, thus raising an interesting question for strict compositionality. Regarding the first construction, I follow Larson (1999) and assume that the adjective incorporates into the determiner of its DP, forming a complex quantifier [D+A]. I present new evidence in favor of this analysis. Since Larson's semantic analysis of complex quantifier [D+A] makes a wrong prediction, I propose an alternative, empirically more adequate analysis that treats D+A compounds as pluractional quantifiers in the sense of Lasersohn (1995). Finally, I turn to the second construction, arguing that - despite superficial similarities to the first construction – it should not be analyzed in terms of complex quantifier formation, but in terms of LF-movement of the adjective to Spec,DP. The discussion suggests that there is more than one way for DP-internal modifiers to take DP-external scope in natural language.

1. Introduction: Adverbial Readings with DP-Internal Adjectives

The English examples in (1a) and (2a) show that in certain cases a DP-internal adjective can take DP-external scope. Both sentences have an 'external' reading on which the adjective is interpreted like its adverbial counterpart, acting on the event structure of the clause. The relevant readings are given in (1b), (2b).

(1) a. [$_{DP}$ The / An occasional] sailor strolled by.

b. Occasionally, a sailor strolled by.

(2) a. [$_{DP}$ Individual students] entered the room.

b. Students entered the room individually (i.e. one by one).

On the reading in (1b), the adjective *occasional* is interpreted like the adverb *occasionally*. On the reading in (2b), the adjective *individual* is interpreted like the adverb *individually*. Both DP-internal adjectives seem to scope out of their embedding DPs, taking scope over the entire clause instead. Hence, they appear to be interpreted not in their overt syntactic position, but outside the DP. This creates a mismatch between overt syntactic structure and semantic structure, and raises the question of how the adverbial interpretations in (1b) and (2b) can be obtained from the syntactic structure of (1a) and (2a) in a compositional manner. I will refer to this problem as the mismatch problem.

In general, there seem to be three options to solve the mismatch problem. All three options involve syntactic movement of the adjective to a position from where it can take scope over the rest of the clause. The adjective could be extracted from out of the DP at LF, as in (3a). It could form a complex quantifier by incorporating into the determiner, as in (3b). Or, à la Kayne (1994), it could move to the specifier of DP at LF, as in (3c).

(3) a. Adj_i … $[_{DP}$ D [t_i NP]]

b. $[_{QP}$ $[_{Q}$ D+Adj_i] [t_i NP]]

c. $[_{DP}$ Adj_i [D [t_i NP]]]

The three options correspond to Matthewson's (1998) threefold distinction of quantificational structures into A-, DP-, and D-quantification. They differ as to the position and nature of the quantificational element. It can be an adverb (with A-quantification), a quantificational head in D (D-quantification), or a modifier in Spec,DP (DP-quantification).[1] English allows for all three options, as illustrated in (4).

(4) a. We *often* went to the pub. (A-quantification)

b. We read [*each* book]. (D-quantification)

c. We sold [*all* [the tickets]]. (DP-quantification)

Turning back to the question of how to account for DP-external readings with DP-internal (in overt syntax) adjectives, Kitagawa (1986) has argued for the existence of LF-extraction (option 3a) in Japanese. In this paper, I argue that the other two options, (3b) and (3c), are also instantiated in

natural language, namely by the constructions in (1a) and (2a). In particular, sentence (1a) will be argued to involve complex quantifier formation (option 3b) on the relevant reading. In contrast, sentence (2a) will be argued to involve movement to Spec,DP (option 3c), despite its superficial similarity to (1a). The upshot of the discussion will be that all three possibilities for DP-external readings with DP-internal adjectives are actually realized in natural language.

The paper is structured as follows. In section 2, I introduce the construction in (1a) in more detail, including a number of significant syntactic and semantic restrictions. The adequate syntactic and semantic analysis of sentences like (1a) makes up the larger part of the paper. In section 3, I argue that Larson's (1999) syntactic analysis of (1a) in terms of complex quantifier formation (by incorporating the adjective into the determiner) is correct, and that it accounts for the mismatch problem as well as for the observable restrictions. In section 4, I present new evidence from German and Finnish that supports the complex quantifier analysis. In section 5, I argue that the semantic part of Larson's analysis must be revised since it makes an incorrect prediction. I propose an empirically more adequate semantic analysis of (1a) as involving a pluractionality marker in the sense of Lasersohn (1995). Finally, I turn to the analysis of sentences like (2a) in section 6, arguing that these constructions should not be analyzed in terms of complex quantifier formation, but as involving movement of the adjective to Spec,DP. I conclude in section 7.

*2. The '*Occasional-*Construction' (OC)*

The observation that sentences like (1a), repeated here, have not only the expected attributive reading (5b), but also an additional 'external' reading synonymous to the adverbial paraphrase in (5a) goes back to Bolinger (1967).

(1) a. [$_{DP}$ The / An occasional sailor] strolled by.

(5) a. Occasionally, a sailor strolled by. = external (adverbial) reading

b. Someone who sails occasionally strolled by. = attributive reading

The examples in (6) show that the possibility of an external reading is not restricted to *occasional*. It can be found with any other adjective of 'infrequency', e.g. *sporadic*, *infrequent*, *rare*, and *odd*.[2]

(6) a. Sally heard [$_{DP}$ the / a *sporadic* shot].
'Sporadically, Sally heard a shot.'

b. [$_{DP}$ The *rare* bird] was seen.
'Rarely, a bird was seen.'

c. [$_{DP}$ The *infrequent* visitor] was seen.
'Infrequently, a visitor was seen.'

In the following, I will subsume all DPs that allow for external readings of infrequency adjectives contained within them under the cover term '*occasional*-construction' (henceforth: OC).

Stump (1981) and Larson (1999) observe that OCs obey the following syntactic and semantic constraints. First, the infrequency adjective must be adjacent to the determiner (Stump 1981, Larson 1999). Intervening adjectives block the external reading (cf. 7b).[3]

(7) a. [*The / An occasional* well-dressed sailor] strolled by.
'Occasionally, a well-dressed sailor strolled by.'

b. [*The / A* well-dressed *occasional* sailor] strolled by.
NOT: 'Occasionally, a well-dressed sailor strolled by.

Second, the infrequency adjective must not be coordinated with another adjective (Stump 1981).

(8) [The / An *occasional and well-dressed* sailor] strolled by.
NOT: 'Occasionally, a well-dressed sailor strolled by.'

Third, the DP must be headed by a definite or indefinite (singular) article (9a), or by the (semantically bleached) 2nd singular possessive pronoun (9b). OCs are impossible with cardinal quantifiers (10a), strong quantifiers (10b), or demonstratives (10c) (Larson 1999).

(9) a. [*The/ An* occasional customer] entered the shop.
'Occasionally, a customer entered the shop.'

b. Well, [*your* occasional sailor] would also show up.

‘Occasionally, a sailor would show up.’

(10) a. [*Two* occasional customers] entered the shop.

NOT: ‘Occasionally, two customers entered the shop.’

b. [*Every* occasional customer] entered the shop.

NOT: ‘Occasionally, every customer entered the shop.’

c. [*This* occasional customer] entered the shop.

NOT: ‘Occasionally, this customer entered the shop.’

Fourth and last, OCs only occur with infrequency adjectives (Larson 1999). Frequency adjectives are out, despite the existence of appropriate adverbial counterparts.[4]

(11) a. [A *frequent* sailor] strolled by.

NOT: ‘Frequently, a sailor strolled by.’

b. Barbara saw [a *regular* customer].

NOT: ‘Regularly, Barbara saw a customer.’

Obviously, any analysis of OCs should provide an adequate account for these restrictions, apart from solving the mismatch problem.

3. Solving the Mismatch

3.1 The Problem

The existence of external readings for infrequency adjectives constitutes a problem for compositionality. Consider (12) for illustration.

(12) The occasional sailor strolled by.

Since the external reading of (12) is synonymous to that of its adverbial counterpart (cf. 5a), its semantic structure should be structurally similar to that of the latter. Thus, the overt syntactic structure in (13) will translate as (14a), if we treat adverbial quantification as unselective

quantification over cases (e.g. Lewis 1975, Kamp 1981, Heim 1982), or as (14b), if we treat adverbial quantification as asymmetric quantification over events or situations only (e.g. Heim 1990, de Swart 1991, von Fintel 1994).

(13) $[_{IP}\ [_{DP}$ The $[_{NP}$ occasional $[_{NP}$ sailor]]] $[_{VP}$ ev(ent) $[_{V'}$ strolled by]]].

(14) a. OCCASIONAL<e,x> [sailor(x) & event (e)] (strolled-by (x,e)) [5]

'There is an occasional pair of event e and sailor x: x strolls by at e.'

b. OCCASIONAL<e> [event (e)] (∃x (sailor (x) & strolled-by (x,e))

'There is an occasional event e: there is a sailor strolling by at e.'

Both semantic structures in (14) share the relevant structural property. The quantifier OCCASIONAL has scope over the entire sentence.[6] In particular it semantically binds a Davidsonian (1967) event variable, which I take to be realized in the overt syntactic structure in (13), namely as the outermost syntactic argument of the VP (cf. Kratzer 1995). Assuming the event variable to be present in the overt syntax will help to account for a difference between English and German OCs in 4.2.

The problem with (13) is that the adjective *occasional* cannot syntactically bind the event variable from its overt DP-internal position because it does not c-command it. Since semantic binding depends on syntactic binding (cf. Heim & Kratzer 1998), we must conclude that the adjective *occasional* does not semantically bind (and quantify over) the event variable in (13). Hence, we cannot derive the external reading from the syntactic structure in (13), let alone compositionally.

As shown in section 1, there are three options for the adjective in (13) to get into a position from where it can bind the event argument: (i) LF-extraction, as in (15a) (cf. Kitagawa 1986); (ii) the formation of a complex quantifier by incorporation into the determiner, as in (15b); or (iii) LF-movement to the specifier position of DP, as in (15c).

(15) a. $[_{IP}$ occasional$_1$ $[_{IP}\ [_{DP}$ the/an t_1 sailor] $[_{VP}$ ev strolled by]]].

b. $[_{IP}\ [_{QP}[_{Q}$ the/an+occasional$_1$] $[_{NP}$ t_1 sailor]] $[_{VP}$ ev strolled by]].

c. $[_{IP}\ [_{DP}$ occasional$_1$ [the/an t_1 sailor]] $[_{VP}$ ev strolled by]].[7]

I follow Larson (1999) and Stump (1981) and assume that the adjective syntactically incorporates into the determiner, thus forming a complex syntactic element (cf. 15b). In 3.2, I discuss some conceptual and empirical problems for the alternative derivations (15ac). In 3.3 and 3.4, I present Larson's analysis and show how it accounts for (most of) the restrictions on OCs.

3.2 Arguments against LF-extraction or LF-movement to Spec,DP

The following arguments against LF-movement of the adjective out of DP, or to the specifier of DP, are not meant to be conclusive. They only serve to illustrate the point that solution (15b) faces fewer problems than its alternatives in (15ac).

An LF-extraction account faces two kinds of problems. Let us call these the (in)definiteness problem and the extraction problem respectively. Concerning the (in)definiteness problem, Larson (1999) observes that an infrequency adjective inside a *definite* DP corresponds to an infrequency adverbial outside an *indefinite* DP (16ab).

(16) a. [$_{\text{DPdef}}$ *The* occasional customer] entered the shop.

b. Occasionally, [$_{\text{DPindef}}$ *a* customer] entered the shop.

If *occasional* in (16a) raised out of DP (presumably yielding an LF-structure isomorphic to the overt structure (16b), *modulo* the choice of determiner), we would expect (16a) to be synonymous to (17).

(17) Occasionally, [$_{\text{DPdef}}$ *the* customer] entered the shop.

This is not the case, as witnessed by the synonymy of (16ab). Hence, the LF-extraction account gives no explanation for the switch in the choice of determiner.

Regarding the extraction problem, it is a well-known observation (cf. Fiengo & Higginbotham 1981) that specific NPs (which are often introduced by definite determiners) are opaque for overt and covert extraction. This is illustrated in (18ab) for overt *wh*-extraction and covert QR.

(18) a. *Who did you see [the picture of t]?

b. ?[This man from every American city] owns a Porsche.

NOT: 'For every American city y, this man from y owns a Porsche.'

Consequently, the specificity constraint should block extraction of the adjective in (16a) out of the embedding definite DP.[8]

The extraction problem does not apply to the Movement-to-Spec,DP account in (15c) because here the adjective is not extracted out of DP. However, this approach offers no solution to the (in)definiteness problem in (16ab) and (17) either. It is unclear why movement of the infrequency adjective across the definite determiner to Spec,DP in (16a) should result in a reading analogous to (16b), and not (17). In addition, both alternative accounts do not explain the fact that external readings are possible with infrequency adjectives, but not with frequency adjectives.

In sum, we have seen that there are reasons to be sceptical about the options (15a) and (15c). Let us turn to the third option in (15b) instead.

3.3 Complex Quantifier Formation (CQF) (Larson 1999)

Larson (1999) analyzes OCs as involving a complex quantifier that is formed by incorporation of the adjective into the determiner. Larson gives the syntactic structure in (19) (=15b) for (1a). Larson's semantic representation is given in (20).

(19) $[_{IP}$ [QP[Q the/an+occasional$_1$] $[_{NP}$ t_1 sailor]] $[_{VP}$ ev strolled by]].

(20) INFREQ<e,x> [part-of(e,e*) & sailor'(x)] (strolled-by'(x,e))

'For few pairs <e,x> such that e is part of some larger contextually given event e*, and x is a sailor, e consists of a strolling by of x.'

In other words, the adjective in an OC is not a quantificational element by itself. It forms a syntactically complex element with the determiner by head-adjunction to the latter.[9, 10] The resulting complex element translates as the quantifier INFREQ, which quantifies over pairs of events and individuals.

The resulting syntactic structure in (19) can be interpreted compositionally. The complex quantifier denotes a function of type <et,<<iet>,t>>, with i the type of events, and forms a Generalized Quantifier (GQ) with the denotation of the NP-complement (cf. Barwise & Cooper 1981). This GQ takes the VP-denotation as its semantic argument, mapping it onto a truth-value. Note that compositionality does not extend into the complex quantifier. After all, we have seen that choosing the indefinite or the definite article as part of the complex quantifier does not make a difference for the overall meaning of OCs. As indicated in (14b), quantification over pairs of events and individuals is not the only way to model the semantics of (19). An alternative way would be to have INFREQ quantify asymmetrically over events only. Nevertheless, I will retain Larson's pair-quantification for reasons to be discussed in section 4.4.

The CQF-analysis does not encounter the same problems as its alternatives. The complex quantifier [$_{Q}$ D+A] can bind the event variable in VP, just like the D-quantifier *every* in (21) can bind an overt VP-internal pronoun.[11]

(21) [$_{DP}$ [$_{D}$ Every$_{i}$] worker] got his$_{i}$ paycheck.

LF-extraction via QR does not apply, hence the problem regarding extraction out of definite DPs vanishes. The difference in meaning between (16a) and (17) is explained by the fact that these sentences have different LF-structures. At LF, (16a) contains no independent determiner *the*. It contains only a complex quantifier formed by *the* + *occasional*.

3.4 CQF Accounts for the Restrictions on OCs

The CQF-analysis in (19) and (20) immediately accounts for three of the four restrictions on OCs.

Since CQF is the result of syntactic head-movement, the adjacency requirement and the non-coordination requirement, illustrated again in (22ab), are accounted for on the base of general restrictions on (head) movement.

(22) a. [The / A [well-dressed [occasional sailor]]].

b. [The / An [[occasional and well-dressed] sailor]].

(22a) has no external reading because incorporation of the adjectival head *occasional* into the determiner across the intervening head *well-dressed* is excluded by the 'Head Movement Constraint' or its successors in Relativized Minimality and Minimalist Program (cf. Travis 1984, Rizzi 1990, Chomsky 1995). In (22b), the 'Coordinate Structure Constraint' (Ross 1967) blocks head movement of *occasional* to D.

The impossibility of CQF with determiners other than the definite or the indefinite article (cf. 23ab) can be accounted for in two different ways.

(23) a. *Two* / *many* / *most*/ *every* occasional sailor(s) strolled by.

b. *This* occasional sailor strolled by.

First, one could simply stipulate a selectional restriction on *occasional* that would keep it from combining with determiners other than *the* or *a(n)*. A more elegant, and stronger hypothesis that I adopt here is that determiners with inherent semantic content (be it deictic or quantificational) cannot take part in CQF because their inherent semantics must not be overwritten. The underlying idea here is that complex syntactic items with particular semantic properties can only be formed if the properties of the complex item do not clash with the intrinsic semantic properties of its parts. According to this line of thinking, CQF is restricted to definite and indefinite articles because these determiners have no inherent semantic content, but only a discoursive function (cf. Heim 1982). Further support for this zero-D-semantics account comes from the fact that, as was observed in connection with (9b), the contentful possessive pronoun *your* can only occur in OCs when entirely bleached of its semantics, including any trace of reference to the addressee.[12]

This leaves us with the last restriction. So far, the analysis cannot explain why frequency adjectives like *frequent* are excluded from OCs. In section 5.4, I will argue that the reason is essentially the same as the one that excludes quantificational and deictic determiners from this construction. The semantic nature of frequency adjectives is not compatible with that of complex quantifiers in OCs. Hence, they cannot undergo CQF, and no OC is formed.

4. The QP-Status of OCs: Independent Evidence from German

4.1 Complex Quantifier Formation in German

There is disagreement in the literature on the categorial status of the complex element [D+A]. Stump (1981) takes it to be a frequency operator on propositions, while Larson (1999) treats it as a complex quantifier (turning the entire OC into a QP). In this section, I support the quantificational view with independent evidence from German, which also has OCs. First, I show that German has other [D+A]-compounds with a quantifying force. Second, I argue in 4.2 that a QP-analysis of OCs accounts for an interesting difference between English and German OCs.

Let us first look at independently attested cases of CQF. Haspelmath (1995:366) observes that the sequence of definite article *die* 'the' and adjective *ganzen* 'whole, entire, intact' is often interpreted as a universal quantifier in contemporary spoken German.[13] For (24a), this is the only reading available. For (24b), the quantifier reading is strongly preferred over the attributive reading (Haspelmath's examples 6ab).

(24) a. Wer hat denn *die ganzen* Punkte hier gemalt?
who has then *the whole* dots here painted
'Who has painted *all the* dots here?' (quantificational reading)
NOT: 'Who has painted the whole/intact dots here?' (attributive reading)

b. Die ganzen Tassen sind verschwunden.
The whole cups have disappeared
'All the cups have disappeared.' (quantificational reading)
'The intact cups have disappeared.' (attributive reading)

The universal quantifier reading for the sentences in (24ab) is accounted for if we assume a syntactic structure like (25a). (25b) is isomorphic to the proposed structure for OCs, repeated as (25b).

(25) a. $[_{IP}\ [_{QP}\ [Q\ die_{det}+ganzen_{adj,1}]\ \ [_{NP}\ t_1\ Tassen]\ [_{VP}\ sind\ verschwunden]]$.

b. $[_{IP}\ [QP[Q\ the/an+occasional_1]\ \ [_{NP}\ t_1\ sailor]]\ \ [_{VP}\ e\ strolled\ by]]$.

Furthermore, complex universal quantifier formation from articles (overt or covert) and adjectives expressing 'wholeness' is attested diachronically in a variety of languages. Other examples are Portuguese *todos* as in *todas as amigas* 'all the friends' vs. *toda a casa* 'the whole house', and Modern Greek *óla* as in *óla tá spítia* 'all the houses' vs. *óli tí méra* 'the whole day, all day' (Haspelmath 1995:365), as well as the Hungarian *az o.sszes* in *as o:sszes diák* (the whole student-sg.) 'all the students' (Lipták, p.c.).

I conclude that CQF in the case of OCs is not an exotic accident, but an instance of a process of grammaticalization, which is attested cross-linguistically. Articles and adjectives can combine to form a complex quantifier. The meaning of the newly formed quantifier depends non-arbitrarily on the original meaning of the adjective. If the adjective expresses wholeness, the complex quantifier will be universal (cf. Haspelmath 1995:366f.). If it expresses infrequency (in OCs), the quantifier will be 'pluractional'. I discuss pluractionality in section 5.

4.2 Differences in the Distribution of OCs in English and German

Analyzing OCs as Quantifier Phrases (QPs) also enables us to account for an interesting difference in the distribution of OCs in English and German.

In English, OCs can occur in subject (26a), direct object (26b), indirect object (26c), and prepositional object/locative position (26d).

(26) a. [An occasional customer] entered the shop.
'Occasionally, a customer entered the shop.'

b. PAGAD blows up [the occasional building].
'Occasionally, PAGAD blows up a building.'

c. Bill sent [an occasional woman] flowers.
'Occasionally, Bill sent a woman flowers.'

d. We stopped at [the occasional roadhouse].
'Occasionally, we stopped at a roadhouse.'

In German, OCs are restricted to subject position (cf. 27a-d).[14]

(27) a. [Ein gelegentlicher Kunde] betrat den Laden. (SUBJ)
an occasional customer entered the shop
'Occasionally, a customer entered the shop.'

b. # PAGAD zerstörte [das gelegentliche Gebäude]. (DO)
PAGAD destroyed the occasional building

c. # Peter schickte [einer gelegentlichen Frau] Blumen. (IO)
Peter sent an occasional woman flowers

d. # Wir stoppten bei [dem gelegentlichen Rasthaus]. (LOC)
We stopped at the occasional roadhouse

We can attribute the difference in distribution to the fact that in German – unlike in English – non-subject QPs cannot take inverse scope at LF. This is generally attributed to the absence of QR to sentence-initial position in German (cf. Sæbø 1995, Krifka 1998), as witnessed by the non-availability of inverse scope readings for (28ab) under neutral intonation (cf. Frey 1993, Pafel 1993, Krifka 1998).

(28) a. Ein Mann liebt jede Frau.
a/some man loves every woman
NOT: 'For every woman y, there is some man x, such that x loves y.'

b. Ein Verehrer schickte jeder Frau Blumen.
a/some admirer sent every woman flowers
NOT: 'For every woman y, there is an admirer x, who sent y flowers.'

Now, given that an OC requires sentential scope at LF for interpretability (only then can it semantically bind the event-variable in the outermost VP-position under c-command), we predict OCs to be blocked from German VP-internal position. First, they fail to c-command and semantically bind the event variable from their base position, which is syntactically lower than the event variable. Second, the inapplicability of QR bans them from moving at LF to a position from where they would c-command, and consequently bind the event variable semantically (see also the structure in (13)). I

conclude that treating OCs as QPs allows for a unified explanation for the absence of non-subject OCs and the absence of inverse scope readings in German.[15,16]

Let us note in passing that this account extends to Finnish, another language where inverse scope of objects over subjects is not attested.[17] Hakulinen/Karlsson (1979:82) give the following example:

(29) Jonkun ruotsalaisen tuntevat kaikki suomalaiset. ∃∀, *∀∃
some-acc Swede-acc know-3pl all Fins-nom
'Some Swede, all Fins know.'

Assuming that the absence of inverse scope in (29) is due to the inapplicability of QR in Finnish (like German, a language with great freedom of movement in the overt syntactic component), OCs in Finnish should also be impossible in other than subject position. This prediction is borne out.[18]

(30) a. [Satunnainen asiakas] meni kauppa-an. (SUBJ)
occasional customer went shop-into
'An occasional customer entered the shop.'

b. PAGAD valitsi satunnaisen rakennuksen. (DO)
PAGAD chose occasional-acc building-acc
NOT: 'Occasionally, PAGAD chose a building.'

c. Jukka antoi satunnaise-lle naise-lle kukkia. (IO)
Jukka gave occasional-to woman-to flowers
NOT: 'Occasionally, Jukka gave flowers to a woman.'

The Finnish data show that the phenomenon of OCs is not restricted to English and German, and they suggest that the present analysis of OCs as QPs is on the right track.

Finally, the QP-analysis of OCs makes another interesting prediction. OCs should be possible with non-subjects in German, if the latter have raised out of VP overtly. In this case, they should bind the event variable and receive a proper interpretation. The prediction seems to be borne out, as shown in (31).

(31) [$_{CP}$[Ein gelegentliches Bierchen]$_1$ haben [$_{IP}$wir auch [$_{VP}$ e t_1 getrunken]]].
the occasional beer-acc have we too drunk
'Of course, we have occasionally drunk a beer, too.'

To conclude, it was shown that there are independent instances of complex quantifiers formed from article and adjective in German, which gives support to the CQF-analysis for OCs. Furthermore, a quantifier analysis of the complex [D+A] (resulting in a QP-analysis for OCs) helps to explain the different distribution of OCs in English on the one hand, and German and Finnish on the other.

4.3 Weak (Intersective) vs. Strong (Non-Intersective)

Regarding the status of OCs as weak or strong QPs, I argue that OCs constitute weak QPs. 'Weak' and 'strong' are to be understood in the sense of Milsark (1977), where these terms are used to distinguish intersective (or symmetric) from non-intersective (or proportional) QPs. The claim that OCs constitute weak QPs in Milsark's sense is supported by empirical evidence as well as by theoretical considerations.

OCs are able to occur in existential *there*-sentences. This is a standard diagnostic for weak QPs (cf. Milsark 1977, de Hoop 1995).

(32) a. There was the/ an occasional sailor strolling by.
b. There were some/ two/ more than five sailors strolling by. (weak/intersective QPs)
c. *There were all/ most sailors strolling by. (strong/non-intersective QPs)

An anonymous reviewer points out that the fact that the presence of the definite determiner in (32a) does not give rise to the usual 'list reading' further confirms the weak status of OCs.

In addition, treating OCs as strong QPs yields the wrong truth-conditions for sentences like (33). On a strong (proportional) reading, (34a) is interpreted as in (34b) (cf. Partee 1989).

(33) We greeted an/the occasional customer.

(34) a. INFREQ<e,x> [part-of(e,e*) & customer'(x)] (greet'(we, x, e))

= ‘Few of all event-customer pairs were such that we greeted x at e.’

b. $\frac{|\text{customer-event-pairs} \cap \text{greeting-of-customers-events}|}{|\text{customer-event-pairs}|} < k$ (k a fraction or %)

The interpretation in (34b) correctly predicts (33) to be true in a situation with a relatively large number of customers of which we greeted only few (because we did not like the others). However, (33) is also true in a situation with only few customers to begin with, but in which we greeted all of these few customers. This situation is not covered by the stronger proportional reading in (34b). (34b) predicts (33) to be false in such a situation, contrary to fact.[19]

If we treat OCs as weak QPs, the problem does not arise. The semantic representation in (35ab) predicts (33) to be true in both situations, while being maximally isomorphic to its syntactic structure.

(35) a. INFREQ<e,x> [part-of(e,e*) & customer’(x)] (greet’(we, x, e))

= ‘There are few event-customer pairs <e,x> such that we greeted x at e.’

b. $|\text{customer-event-pairs} \cap \text{greeting-of-customers-events}| < n$ (n a natural number)

Given the additional empirical evidence in (32a), I conclude that OCs are QPs headed by the weak quantifier INFREQ, which is syntactically realized as the complex head [D+A].

4.4 Symmetric vs. Asymmetric Quantification

As mentioned in section 3.1, there are (at least) two ways to represent the quantifying force of OCs. Consider (33) again. The quantifier INFREQ could be taken to quantify over pairs of events and customers as in (35a), repeated. Or it could (asymmetrically) quantify over events only, as in (36).

(35) a. INFREQ<e,x> [part-of(e,e*) & customer’(x)] (greet’(we, x, e))

(36) INFREQ<e> [part-of(e,e*)] ($\exists$x customer’(x) & greet’(we, x, e))

Since INFREQ is a weak quantifier, (35a) and (36) are equivalent representations of the meaning of OCs. In addition, both analyses involve the notion of ‘event’ or ‘eventuality’. This means that the

option of choosing for an analysis that does without the (potentially) problematic notion of 'event' in favor of quantification over tupels of individuals (i.e. Lewis's (1975) 'cases') is not available.[20] So how to decide on what the semantic representation of OCs should be?

An argument in favor of (36) is that it is needed independently for sentences like (37a).

(37) a. Occasionally, Larry kissed Sue.

b. INFREQ<e> [part-of(e,e*)]: kissed'(L, S, e)

(37a) contains no indefinite expression that could contribute an individual variable, say 'x', over which to quantify. The only variable in the proposition expressed by *Larry kissed Sue* is an event variable (introduced by the verb). Consequently, the adverbial quantifier in (37a) does not quantify over pairs of events and individuals, but only over events, as indicated in (37b).

On the other hand, only (35a) allows for a transparent mapping from syntax to semantic structure in line with Diesing's (1992) Mapping Hypothesis. The Mapping Hypothesis says that (indefinite) nominal material from outside VP is mapped into the restriction of a quantifier with sentential scope, whereas VP-internal NPs are mapped into the nuclear scope of that quantifier. After QR, the NP *customer* in (33) is located outside the VP.[21] Therefore, the Mapping Hypothesis is satisfied by (35a), but not by (36). In addition, having the complex quantifier *the/a+occasional* range over pairs of events and individuals reflects its adnominal status in the syntax.

Given this, I stick to the semantic treatment of OCs in terms of quantification over pairs of events and individuals (cf. 35a) in order to ensure a maximal degree of structural isomorphy and transparency in the mapping from syntax to semantic structure. Nevertheless, both (35a) and (36) are equivalent formulas and can do the same job. Since nothing hinges on it, the reader is invited to choose whichever semantic analysis s/he favors.[22]

4.5 Pseudoscope Effects in German

Before I go on to discuss the semantics of OCs in more detail, it is necessary to turn to two apparent counterexamples to the analysis of OCs presented above.

While it is true that German forbids OCs in object position of factive verbs (38a), sentential scope seems to be possible for infrequency adjectives in object position of perception verbs (38b), and for infrequency adjectives in object position of what Larson, den Dikken & Ludlow (henceforth: LDL) (1997) call 'intensional transitive verbs' (38c).

(38) a. *Wir küssten [ein gelegentliches Mädchen]. factive
we kissed an occasional girl

b. Wir sahen [ein gelegentliches Schiff]. perception
we saw an occasional ship
'Occasionally, there was a ship and (in that event) we saw that ship.'

c. Wir brauchen [ein gelegentliches Bier]. intensional
We need an occasional beer
'Occasionally, we need a beer.'

In my view, the sentences in (38bc) are no evidence against the analysis of OCs presented here. In particular, I would like to argue that the sentences in (38) do not involve a complex INFREQ-QP taking scope over the matrix clause, but that the matrix scope of the infrequency adjective is spurious.

To begin with, observe the difference in meaning between (38b) and its English counterpart (39).

(39) We saw an occasional ship.

Unlike (39), the German sentence (38b) is not true in a situation in which many ships pass by, but only few ships are actually observed. The absence of this reading shows that there is no complex quantifier INFREQ which takes matrix scope in (38b). If there was, this reading should be available given our analysis of INFREQ as an intersective quantifier over pairs of individuals and events.

Next, observe the following sentence pair.

(40) a. Peter sah zu, als gelegentlich ein Schiff vorbeifuhr.
Peter watched as occasionally a ship passed_by

b. ?Peter sah zu, als [ein gelegentliches Schiff]vorbeifuhr.

Peter watched as an occasional ship passed_by

'Peter watched as, occasionally, a ship passed by.'

(40ab) are virtually identical in meaning. Moreover, the elements expressing infrequency (i.e. adverb and adjective respectively) have an effect on the matrix verb and on the embedded verb. The events denoted by both verbs occur only occasionally. Let us further assume that (40b) contains a complex INFREQ-QP in subject position of the embedded clause. With Reinhart (1997), I assume that the syntactic operation QR is clausebound. Therefore, INFREQ-QP should not be able to extract from the embedded clause, especially if the embedded clause is in adjunct position as in (40b) (cf. Huang 1982). As a consequence, we cannot account for the apparent wide-scope of adverb and adjective by raising them at LF. Besides, giving the infrequency adjective scope over the matrix sentence would yield an incorrect reading that is paraphrased in (41).

(41) Peter watched occasionally as a ship passed by.

Let us assume that the apparent sentential scope of the infrequency element in (40a) is not the result of a grammatical operation, but the result of an inference operation applying at a later stage in the semantic interpretation. The perception expressed by *sah zu* 'watched' in (40) is contingent on the events watched. One can only watch an event if there is an event. If this event occurs only occasionally it is clear that the watching event will occur only occasionally, too. Therefore, I take the apparent influence of the infrequency adjective on the event structure of the matrix clause in (40b) to be indirect. Borrowing the term from Kratzer (1998), let us capture this phenomenon under the label 'pseudoscope'.

The seemingly problematic cases in (38bc) are now reducible to instances of pseudoscope. In order for this reduction to work, we will have to assume that the verbs in question select for a propositional complement. The complex quantifier INFREQ forms part of this propositional complement and quantifies over its event-variable. Perception verbs are known to take propositional complements in the form of ECM-constructions. If so, we can assign (38b) the underlying propositional structure in (42), with the verb of the propositional complement being phonetically empty (indicated by strikethrough).

(42) Wir sahen [$_{IP}$ [$_{QP}$ ein gelegentliches Schiff] [$_{VP}$ ev ~~vorüberfahren~~]]. = (38b)
We saw an occasional ship pass_by

Likewise, LDL (1997) argue that intensional transitive verbs always select for an implicit infinitival complement that contains two silent elements: TO (the counterpart of overt *to*) and HAVE (the counterpart of overt *have*). The infinitival complement expresses the proposition 'somebody has something', and the object of the intensional transitive verb is the underlying object of this infinitival complement. Let us assume, then, that the QP-object of the embedded propositional complement moves to the embedded Spec,CP, presumably for discourse reasons, yielding the structure in (43). As seen in connection with the overt topicalization structure in (31), an INFREQ-QP in Spec,CP can bind the event-variable inside the VP under c-command.[23]

(43) Wir brauchen [$_{CP}$ [$_{QP}$ ein gelegentliches Bier]$_1$ C [$_{IP}$ PRO TO [$_{VP}$ ev HAVE t_1]]]
we need an occasional beer
'We need to occasionally have a beer.' = 'Occasionally, we need to have a beer.'

We can now account for the apparent matrix scope of the infrequency adjectives in object position in (38bc). No raising of the infrequency adjective to the matrix clause takes place. Instead, the complex quantifier INFREQ quantifies over the event-variable of a hidden propositional complement. Since the matrix events/situations of 'seeing' and 'needing' are contingent on the event/situation expressed by the complement, they are also contingent on the (in)frequency of this event/situation. The pseudoscope-effect arises.

Summing up, it was shown that the examples in (38bc) only appear to pose a problem for the present account of OCs. (38bc) can be analyzed as involving CQF in an implicit propositional complement plus pseudoscope of this quantifier over the event structure of the matrix clause.

5. The Occasional-*Construction as a Pluractionality Marker*

In this section, the semantics of OCs are subject to further scrutiny. I show that Larson's semantic analysis of OCs is in need of revision because it makes an incorrect prediction regarding the truth conditions of OCs, even if we treat them as weak QPs. In 5.2 and 5.3, I introduce Lasersohn's (1995) notion of pluractionality marker and apply it to OCs. I show that an analysis of OCs as pluractional quantifiers is empirically more adequate than Larson's (1999) analysis. Finally, I discuss how an analysis using pluractionality marking accounts for the restriction of OCs to infrequency adjectives.

5.1 An Incorrect Prediction

Let us look at the Larsonian semantics for (19) (repeated as 44ab) again:

(44) a. $[_{IP}\ [_{QP}[_{Q}$ The/an+occasional$_1$] $[_{NP}\ t_1$ sailor]] $[_{VP}$ e strolled by]].

b. INFREQ<e,x> [part-of(e,e*) & sailor' (x)] (strolled-by'(x,e))

'There are few event-sailor pairs <e,x> such that e consists of a strolling by of x.'

(44b) incorrectly predicts (44a) to be true in the following situation.[24]

(45) For an hour, nobody strolled by except for three sailors that walked past simultaneously (<e1,x1>,<e1,x2>,<e1,x3>).

The situation in (45) consists of a few sailor-event pairs <e,x> that satisfy the conditions in (44b). Still, (44a) cannot be used to express this situation.[25] A more adequate rendering of the truth-conditions of (44a) is found in (46).

(46) There are some pairs <e,x> of event e (part of a larger contextually given event e*) and sailor x, such that e is a strolling by of x, and *no two walking-by events of sailors overlap in time*.

The italicized addition in (46) blocks (44a) from being true in the situation in (45). Also, the additional semantic property of OCs is a characteristic property of 'pluractionality markers' as discussed in Lasersohn (1995). This fact argues for an analysis of OCs in terms of pluractionality.

5.2 Pluractionality Markers

Pluractionality markers are elements that modify event-denoting expressions (Vs or VPs) and yield a plurality of events. Lasersohn (1995) considers them to function similarly to plural markers in the nominal domain, which modify individual-denoting, singular NPs and yield pluralities of individuals.

According to Lasersohn (1995) there are three ways in which an event can be pluralized. A pluralized event can be iterated (47a), spatially scattered (47b), or it can consist of individually performed actions (as opposed to collective actions) (47c).

(47) a. He whistled *again and again* / *every now and then* / *time and again*.

b. It rained *here and there*.

c. The students came in *individually* / *one at a time*.

Pluractionality markers, then, induce a distribution of a plurality of events (i) over points in time, and/or (ii) over points in space, and/or (iii) over individuals.

Languages differ as to how they mark pluractionality syntactically. Some languages from the North American, Dravidian, and West African language families feature a pluractional suffix that attaches to the verb. In English, pluractionality is expressed by VP-modifiers, most often syntactically complex adverbials (cf. 47a-c), or by distributive quantifiers like *each* or *every* (cf. 48).

(48) $[_{IP}\ [_{QP}\ [_{Q}$ Each] man] $[_{VP}$ lifted the table]].

In (48), the presence of the quantifier *each* (unlike *all*, which favors a collective construal) leads to the construal of a plurality of events of table-liftings that are distributed over different men.

5.3 OCs as Pluractionality Markers

Given the parallel between the semantics of OCs in (46) and the meaning of the pluractionality markers in 5.2, I take the syntactically complex head [D+A] in OCs to have two semantic functions.

Apart from quantifying over pairs of events and individuals, it also functions as a pluractionality marker. It causes distribution of events over time such that no two events may overlap in time (cf. 46).

My analysis differs from that of Stump (1981) in that I do not assume the pluractional nature of the complex [D+A] to automatically block it from being a quantifier. Instead, I treat it in analogy to the distributive universal quantifiers *each* and *every*. Just like those have a lexical specification that sets them apart from their non-distributive counterpart *all* (Gil 1995), I take the quantifier [D+A] to carry an additional semantic marking for pluractionality.

Given that the distributive quantifiers *each* and *every* are able to modify the event structure from their syntactic D-position, yielding a plurality of events, it should come as no surprise that the same is possible with the pluractional quantifier [D+A] in OCs. The structural isomorphy between these two kinds of pluractional quantifiers is illustrated in (49).

(49) a. $[_{IP}\ [_{QP}[_{Q}$ The/an+occasional$_1]$ $[_{NP}\ t_1$ sailor]] $[_{VP}$ e strolled by]].

b. $[_{IP}\ [_{QP}\ [_{Q}$ Each] $[_{NP}$ man]] $[_{VP}$ lifted the table]].

These considerations lead us to the final formalization of the lexical entry for the pluractional quantifier INFREQ, illustrated by our standard example *an/the occasional*.

(50) a. [*an/the occasional*] $\Rightarrow$ [INFREQ<e,x>]

b. [INFREQ<e,x>] =

$\lambda Q \lambda S.\ \exists$<e,x> [part-of (e,e*) $\wedge$ Q(x)]: (S(e,x) $\wedge \forall$<*e',x'*>,<*e'',x''*>*[S(e',x')* $\wedge$ *S(e'', x'')* $\wedge$ *Q(x')* $\wedge$ *Q(x'')]: ((e' = e'')* $\vee$ *(e'* $\neq$ *e''* & $\neg$ *(* τ *(e')* *o* τ *(e'')))))*

(with τ = time of occurrence, o = overlap-relation)

The truth-conditions in (50b) read as 'There are some pairs <e,x>, with e part of a contextually given event e* and x having property Q, such that e is an event S involving x, and all pairs <e',x'>, <e'',x''> of events S involving an x having Q are such *that the events do not overlap in time.*

The highlighted part in (50b) captures the pluractionality effect of INFREQ. The formulation is modeled after Lasersohn's (1995:251-253) formalization of the effects of event-distribution over points in time in (51).

(51) VPpluractional(X) $\Leftrightarrow \forall e,e' \in X\ [VP(e) \wedge \neg(\tau(e)\ o\ \tau(e'))] \ \&\ |X| > 2.$

(51) reads as 'The value of a pluractionally modified VP applied to a set of events X is equivalent to: for any two events e, e' which are elements of a set X, |X|>2, the events fulfil the unmodified VP-predicate, *and the two events do not overlap in time*'.

As also discussed in Lasersohn (ibid.:253f.), the restriction on temporal non-overlap is too weak and should be replaced by a restriction which guarantees that an appropriate stretch of time lies between single instantiations of the event in question. Otherwise, a sentence like *The occasional sailor strolled by* could be truthfully asserted of a situation where three sailors pass by shortly after one another, and these are the only sailors passing by within the course of an hour. Given this, we should replace the term $\neg(\tau(e')\ o\ \tau(e''))$ in (50b) with $\exists t[between'(t, (\tau(e'), \tau(e'')))]$, which reads as 'There is some (intervall) t such that t lies between the event times of e' and e'' ' (cf. ibid.:254).

By replacing the non-overlap condition in (50b) with this stronger condition, and by functional application of (50b) to the NP-denotation Q = (λx.sailor'(x)) and the VP-denotation S = (λeλx.stroll-by'(x,e)), we get:

(52) a. There are some pairs <e,x>, [part-of(e,e*) ∧ sailor'(x)]: (stroll_by'(x,e) ∧ ∀<e',x'>,<e'',x''> [stroll-by'(e',x') ∧ stroll-by'(e'', x'') ∧ sailor'(x') ∧ sailor'(x'')]: ((e'=e'') ∨ (e'≠e'' ∧ ∃t [between' (t, (τ (e'), τ (e'')))]))

b. There are some pairs <e,x>, with e part of a (contextually given) event e*, and x a sailor, such that e is a strolling-by of x, and any two strolling-by events of a sailor occur at separate points in time.

The truth-conditions in (52b) match their informal rendering in (46).

5.4 The Restriction to Infrequency Adjectives Explained

Let us finally turn to the question of why OCs only occur with infrequency adjectives. The complex quantifier [D+A] in OCs was shown to have the syntactic and semantic properties of a pluractionality marker. Syntactically, pluractionality markers are often complex, i.e. they can be formed productively in the syntactic component. This observation seems to hold across languages, as witnessed by the following examples.

(53) a. English: every now and then, again and again, here and there, from time to time
b. German: ab und zu 'from time to time', hin und wieder 'every now and then', immer wieder 'again and again'
c. Finnish: sillöin tällöin 'every now and then'
d. French: de temps en temps 'from time to time'

Semantically, pluractionality markers have a non-overlap condition built in. In the case of OCs, this non-overlap condition enforces distribution of a plural event over separate points in time.

I argue that these two properties taken together block frequency adjectives from occurring in OCs. The pluractional semantics of OCs does not license frequency expressions because these – unlike *in*frequency expressions – do not guarantee a non-overlap of events. This is shown in (54) and (55).

(54) a. In those days, we *occasionally* built houses.
→ Periods of house building necessarily alternate with periods of non-house-building.
b. In those days, we *frequently* built houses.
→ No particular periods of non-house-building necessary.

(55) a. The employees of Starwash *occasionally* clean houses.
→ There are times in which *no* employee is engaged in house cleaning
b. The employees of Starwash *frequently* clean houses.
→ No particular periods of non-house-cleaning necessary

The (a)-sentences, containing the infrequency expression *occasionally*, require the house-cleaning or

house-building events to be separated from one another in time. (55a) can be used felicitously in a situation where the Starwash-employees are mainly busy with cleaning other things (cars, industrial plants), but when business is slow the boss will send them on the occasional house-cleaning job. Similarly, (54a) could be uttered by the boss of a construction company referring to periods of slow business where at times no houses where under construction at all. Crucially, such a temporal non-overlap is not required for a felicitous use of the (b)-sentences. It is true that these sentences *can* also denote a series of temporally separated events, but this is not a requirement. (54b) could equally well refer to a state of affairs where different events of building houses were overlapping in time. What (54) and (55) show is that infrequency expressions have a temporal non-overlap condition built into their semantics, whereas frequency expressions are not specified in this regard (as long as not all events take place at the same time). As a consequence, the latter can be used in non-overlap and overlap-contexts alike.[26,27]

Given this difference, the absence of frequency adjectives from OCs is accounted for. The semantic non-overlap requirement of OCs as pluractional expressions clashes with the inherent semantic properties of frequency expressions, which do not require the denoted set of events to be necessarily non-overlapping in time. Presumably, this lexical specification of frequency expressions cannot be semantically overwritten when the complex pluractional quantifier is formed.

Syntactically, frequency adjectives seem unable to combine with determiners in order to form their own class of 'frequency constructions', at least not in English or German. The grammars of these languages (and perhaps generally) do not seem to allow for the formation of syntactically complex frequency expressions, thus blocking the formation of 'frequency constructions'.

This concludes the discussion of OCs. It was shown that these are best analyzed as complex pluractional quantifiers that are formed by syntactic incorporation of an adjective into a (semantically empty) determiner.

6. The 'Individual-*Construction (IC)'*

Let us finally turn to the question of whether the CQF-analysis can be extended to the second – on the face of it parallel - instance of a DP-internal adjective with DP-external scope from section 1. The

observation that the DP-internal adjective *individual* in (2a), which is repeated from section 1, is interpreted synonymously to its adverbial counterpart in (2b) is due to Larson (1999).

(2) a. [Individual students] entered the room.

b. Students entered the room individually (i.e. one by one).

(2ab) express a situation in which some students entered the room separately (at different times, or from different directions). The same construction is possible in object position.

(56) a. The professor [$_{VP}$ looked at [$_{DP}$ the individual students]].

b. The professor [$_{VP}$ [looked at the students] individually].

Both (56ab) describe a situation in which the professor looked at each of the students in turn.

I will refer to the constructions in (2a) and (56a) as '*individual*-constructions' (ICs). ICs seem to involve distribution of events over participating individuals, which is reminiscent of the analysis of OCs as complex pluractional quantifiers from above. Furthermore, the overt syntactic structure of ICs does not differ from that of OCs, arguing for a unified analysis. Despite these similarities, I will suggest an alternative analysis for ICs in terms of movement of the adjective to Spec,DP. ICs, then, instantiate the third possibility for (overtly) DP-internal adjectives to get DP-external scope.

In section 6.1, I show that *individual* cannot be interpreted as an adjectival modifier on the NP-denotation. In 6.2, I discuss two further similarities between OCs and ICs that seem to hint at a unified analysis in terms of complex quantifier formation. In 6.3, however, I show that such a CQF-analysis of ICs is problematic. Based on this, I argue that ICs are best analyzed in terms of movement of the adjectival to the specifier of DP in 6.4. In 6.5, I specify the semantics of ICs. I conclude in 6.6 with some general remarks on the pluractionalizing abilities of DP-internal expressions.

6.1 Against an In-Situ Interpretation of Individual

At first sight, the adjective *individual* in (56a) could be taken to denote an adnominal operator that is interpreted *in situ* and operates on the denotation of the plural NP *students*. It would seem reasonable,

then, to treat *individual* as a function from <et,t> to <et,t>, mapping plural denotations onto a set of singleton sets. For concreteness, I adopt Chierchia's (1998) theory of plurals. For Chierchia, plural marking maps a set of atomic individuals (the denotation of a singular count noun) into the power set of these individuals minus the atomic individuals (cf. ibid.: 59f.). One could assume, then, that *individual* maps a power set of individuals into the unique set of singleton sets of the atomic elements. Assume further that our model contains exactly three students a, b, and c. In this model, the denotation of the plural NP *students* would be {{a,b}, {a,c}, {b,c}, {a,b,c}}, while the denotation of *individual students* would be {{a}, {b}, {c}}. The semantic function of *individual* could therefore be taken to consist in a mapping of plural denotations into a set of singleton sets, effectively banning collective readings. This in turn gives rise to the semantic effect of event distribution over individuals.

Nonetheless, the following arguments cast serious doubt on analyzing *individual* in (56a) as an NP-modifier. First, the adjective *individual* can combine with singular NPs in phrases like *this/ each individual student*. Second, it remains unclear how the definite determiner *the* in (56a) should semantically operate on the denotation of the plural NP *individual students* given above. The definite determiner is generally taken to enforce a uniqueness condition on the NP-denotation, be it as part of its lexical entry (Russell 1905, Neale 1990), or as part of its presupposition (Strawson 1950, Heim & Kratzer 1998). In other words, it cannot felicitously combine with NPs that denote more than one (contextually salient) individual or set. When *the* combines with a plural NP, this unique set is usually taken to be the maximal set in the plural denotation (cf. Sharvy's 1980 treatment of *the* as a supremum operator). However, the denotation of *individual students* on the modifier analysis contains no such unique maximal set, but only three equally salient sets of equal cardinality 1. For this reason, it is predicted to be impossible for the definite article to take the NP *individual students* as its complement, contrary to fact. Something seems to be amiss either with the semantics of definite determiners, or with the modifier analysis of the adjective *individual*. I would like to suggest that it is the analysis of the adjectival *individual*, and of ICs in general, which should be altered.

6.2 Arguments pro CFQ: Similarities between ICs and OCs

Given the above problem with an *in situ* analysis, it is tempting to analyze ICs as involving CQF. On the CQF-analysis, the adjective *individual* would incorporate into the determiner, thus forming a complex pluractional modifier that distributes plural events over participating individuals. The syntactic structure of (56a) after CQF has taken place is given in (57).

(57) The professor [$_{VP}$ looked at [$_{DP}$ [$_{D}$ the+individual] students]].

Support for a CQF-analysis of ICs comes from the fact that - apart from their pluractional nature and their seemingly identical overt syntax - they share two further properties with OCs. First, ICs do not occur with quantifying or demonstrative determiners, as shown in (58).

(58) a. ? The professor looked at all individual students.
≠ 'The professor looked at all students individually.'
b. ? The professor looked at these individual students.
≠ 'The professor looked at these students individually.'

(58ab) only have an attributive reading on which a (specific) group of students is assigned a set of individual or characterizing properties that sets them apart from other students (see fn. 29).

The second similarity between ICs and OCs is that the adjective *individual* must not be preceded by another adjective, nor must it stand in coordination with another adjective:

(59) a. The professor looked at the intelligent individual students.
≠ 'The professor looked at the intelligent students individually.'
b. The professor looked at the individual and intelligent students.
≠ 'The professor looked at the intelligent students individually.'

The data in (58) and (59) seem to suggest that complex quantifier formation is what is going on in ICs. However, there are certain problems to this view, to which I will turn in the next section.

6.3 Against CQF: Differences between ICs and OCs

A CQF-analysis of ICs is problematic for a number of reasons. A closer inspection of the properties of ICs reveals that they differ from OCs in three important respects. These differences suggest that the IC-determiner does not form a unit with the adjective *individual* at the level of semantic interpretation. Hence, ICs cannot be analyzed in terms of complex quantifier formation.

ICs differ from OCs in three respects apart from the presumably unproblematic fact that they contain only plural NPs. Most strikingly, the choice of determiner does make a difference in the case of ICs. This is unlike what we find with OCs where indefinite and definite determiner give rise to the same reading (see sections 3.2 & 3.3). The contrast between definite and indefinite ICs shows in (60).

(60) a. The professor looked at the individual students.

b. The professor looked at individual students.

Presence of the definite article makes the IC definite (60a). Presence of the (indefinite plural) null determiner makes it indefinite (60b). It appears, then, that the definite and the null determiner are visible in isolation to the interpretive component, suggesting that they do not form a complex element with the adjective. Recall that one of the motivations behind the CQF-analysis for OCs was that the choice of determiner (indefinite or definite) in OCs had no visible effect on their interpretation.

We could, of course, save the CQF-analysis for ICs and assume that there are indeed two complex quantifiers *the+individual* and *0+individual*. But this would make a CQF-analysis of ICs somewhat less appealing. An alternative way out would be to assume that ICs are fully compositional below the X^0-level, i.e. that the semantic component has access to the individual parts of a complex quantifier. Such a move would still not explain, though, why the meaning of the complex quantifier is fully compositional in the case of ICs, but not in the case of OCs.

The second difference is also connected to the fact that the choice of article (overt or covert) is relevant for the interpretation of ICs. Unlike with OCs, the sequence *the+individual* does not correspond to a sequence of indefinite null determiner plus *individually* in the adverbial domain. Compare the non-synonymous sentences in (61ab) with (16ab) from section 3.2.

(61) a. The individual students were criticized.

b. Students were criticized individually.

Again, this difference in meaning suggests that the determiners are visible as independent units at the level of semantic interpretation in ICs, unlike in OCs.

Finally, an anonymous reviewer points out that ICs, unlike OCs, are impossible in existential *there*-contexts if headed by the definite determiner.

(62) *There were the individuals students being criticized.

The ungrammaticality of (62) follows directly if the definite determiner is visible to the semantic component.

To conclude, this section has shown that the determiners in ICs are visible to the semantic component in isolation. This fact argues against a CQF-analysis for ICs. A CQF-analysis could be maintained at the expense of postulating two different complex quantifiers for ICs, one existential and one universal. Such a move significantly lessens the appeal of the CQF-analysis and does not answer the question of why the same difference in meaning is not observed with OCs.

6.4 Movement to Spec,DP

The preceding section has shown that the assumption of CQF is not well motivated in the case of ICs - despite their superficial similarity to OCs. It was also shown that it is problematic to treat the adjective *individual* in ICs as an adnominal modifier operating on the NP-denotation. DP-internal *individual* seems to have an effect on the event structure of a sentence. This leaves us - again - with the problem of how to account for the essentially adverbial character of a DP-internal adjective. Syntactically, this raises the question of where exactly *individual* is located at LF, since it is not interpreted in adnominal position, nor does it form a complex quantifier with the determiner.

I would like to suggest that ICs instantiate the third possibility for DP-internal adjectives with DP-external scope, given as (3c) in section 1. On this view, ICs involve LF-movement of the adjective from an NP-adjoined position to the specifier of DP. A similar movement operation has been argued to take place with NP-adjoined quantifiers in Straits Salish by Matthewson (1998: 310f.), the only

difference being that Matthewson assumes the quantifier to adjoin to DP. On this analysis, (61a) has the LF-structure in (63) after covert movement of the adjective to Spec,DP.

(63) $[_{DP}$ individual$_1$ $[_D$ the $[_{NP}$ t_1 students]]] were criticized.

The LF-structure in (63) does not induce specificity effects, since the adjective never leaves the DP. The structure in (63) also accounts for the interpretive independence of the determiner. On the other hand, ICs are impossible if the adjective is preceded by, or conjoined with another adjective as in (59ab). Presumably, this is due to locality constraints on covert movement of the adjective to Spec,DP. In order to answer the question of what forces movement of the adjective *individual* to Spec,DP in (63), it is necessary to take a look at its semantics.

6.5 The Semantics of Individual: Motivating Movement

This section argues that the need for *individual* to move to Spec,DP in ICs follows from its semantics. I assume that that the adverb *individual* and the adjective *individual* (on its attributive use and in ICs) share a basic meaning. This meaning bans the adjective *individual* from taking a plural NP as its sister, thus forcing movement to Spec,DP.

Schwarzschild (1992) (as presented in Brisson 1998) analyzes the adverb *individually* as taking two arguments. In case, an event is distributed over the subject denotation, as in (64a), *individually* combines with the VP denotation, and then with the denotation of the subject DP (cf. 64b).

(64) a. The students were criticized individually.

b. $[_{IP}$ $[_{DP}$ the students] $[_{VP}$ $[_{VP}$ were criticized] individually]].

Given this, I take the semantics of the adverb *individually* to be as follows:

(65) [[individually]] = $\lambda P \lambda x.\ \forall x' \leq x\ [\ P(x') \wedge \text{atom}\ (x') \wedge \neg \exists y\ [\ y > x' \wedge P(y)]]$

(65) states that all atomic subparts x' of a (in the unmarked case) plural individual x (provided by the DP-denotation) have a certain property P (provided by the VP-denotation), and no group containing x' as a proper subpart has this property. This last part, together with the atomicity condition, ensures that a certain property, such as taking part in a specific event, holds of atomic individuals only. With (65), the meaning of (64a) is as given in (66).[28]

(66) [[64a]] = $\forall x' \leq$ the_students' [$\exists$e criticized'(x',e) $\wedge$ atom(x') $\wedge \neg\exists$y[y>x' $\wedge$ criticized'(y,e)]]

According to (66), (64a) is true iff for all atomic subparts of a specific group of students, there is an event of being criticized, and no plurality of students takes part in the same event of being criticized.

Turning to the adjective *individual* next, the lexical entry given in (65) also allows for a correct derivation of the meaning on its ordinary attributive use in phrases like *this individual student*.[29] The property P is provided by the (singular) NP-denotation.

(67) [[this individual student]] = ιx. $\forall x' \leq$ x [student'(x') $\wedge$ atom(x') $\wedge \neg\exists$y[y >x' $\wedge$ student'(y)]]

(67) deictically points out an individual that (in a given discoursive situation) is the only student around: There is no pluralic group of students. In the case of (67), the universal quantification does not range over a plural group but over an atomic individual, which accounts for a certain degree of superfluousness of the adjective in (67).

We are now in a position to answer the question of what forces movement of *individual* in ICs. As an adjective and as a lexically contentful element, *individual* must be base-generated below the functional D-projection as sister to an NP-node (Fukui 1986). However, the atomicity condition in the meaning of *individual(ly)* in (65) requires its NP-sister to be singular. In order to see why this is so, consider what happens if *individual* combines with a plural NP like *students*:

(68) [[individual students]] = λx. $\forall x' \leq$ x [*students'(x') $\wedge$ atom(x')* $\wedge \neg\exists$y[y >x' $\wedge$ students'(y)]]

Assuming with Chierchia (1998) that plural NPs denote proper plural predicates without atomic individuals in their denotation, the highlighted parts in (68) lead to a contradiction. The condition

students'(x') requires *x'* to be pluralic, while the condition *atom(x')* requires it to be atomic. I assume that LF-movement of *individual* to Spec,DP in ICs takes place in order to avoid this kind of semantic non-interpretability.

In its LF-position in Spec,DP, *individual* is interpretable given one additional semantic modification. It appears that movement of *individual* to Spec,DP effects a reversal in the order of its arguments.[30] Instead of a property and an individual, it now takes an individual (denoted by D+NP) and a property (denoted by VP) in this order as its semantic arguments. By quantifying over the subparts of a plural individual, *individual* in ICs thus instantiates a pattern of (adnominal) quantification that is postulated to hold for Straits Salish in Matthewson (1998) and universally in Matthewson (2001). The meaning of (61a), with the LF-structure in (69), is derived in (70).

(69) $[_{DP}$ individual$_1$ $[_D$ the $[_{NP}$ t_1 students]]] were criticized.

(70) a. $[[\text{individual}_{IC}]] = \lambda x \lambda P.\ \forall x' \leq x\ [\ P(x') \wedge \text{atom}(x') \wedge \neg\exists y\ [\ y >x' \wedge P(y)]]$

b. $[[\text{individual}_{IC}\ \text{the students}]] = \lambda P.\ \forall x' \leq \text{the\_students'}\ [\ P(x') \wedge \text{atom}(x') \wedge \neg\exists y[\ y >x' \wedge P(y)]]$

c. $[[\text{individual}_{IC}\ \text{the students were criticized}]] =$

$\forall x' \leq \text{the\_students'}\ [\ \exists e\ \text{criticized'}(x',e) \wedge \text{atom}(x') \wedge \neg\exists y[\ y >x' \wedge \text{criticized'}(y,e)]]$

As desired, the truth conditions for (61a) are identical to those of its synonymous adverbial counterpart (64a) in (66).[31]

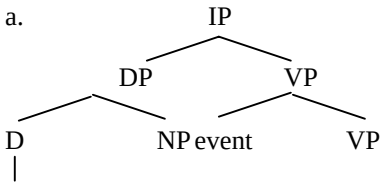
To conclude, it was argued that *individual* in ICs must move to Spec,DP for semantic reasons. *Individual* in base position cannot take a plural NP as sister. Since ICs occur only with plural NPs, it follows that *individual* has to move to a position where it can be interpreted. Assuming a reversal of the order of arguments (see fn.30), *individual* in Spec,DP can be correctly interpreted.

6.6 Pluractionality Effects with Adnominal Elements

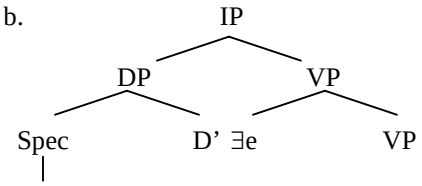
The pluractionality effect that is observable with ICs is due to the event-variable being existentially bound in the nuclear scope of the universal quantifier in (70c). An analogous effect of pluractionalization was observed in connection with the adnominal quantifier *each* in (48). If so,

there is a second reason for the adjective *individual* in ICs to move to Spec,DP. Just like the complex quantifier *the/an+occasional* in OCs needs to be in a position from where it can bind the event variable in VP, *individual* needs to be in a position from which the universal quantifier can take scope over the existential event quantifier, which – following Diesing (1992) – I take to be located at the edge of VP. The relevant configurations for OCs and ICs are illustrated in (71ab).

(71) a.



b.



Looking at (71ab), it appears that pluractionality effects with adnominal expressions only come about when the expressions occupy a left-peripheral position inside the DP. This state of affairs is (tentatively) summarized in form of the empirical generalization (72).

(72) An adnominal element inside DP can induce pluractionality iff it occupies a left-peripheral position inside the DP.

The generalization in (72) captures other instances of pluractionality with adnominal expressions, such as (73a) (cf. Krifka 1990, Doetjes & Honcoop 1997), (73b) (cf. Moltmann 1992, 1997), as well as (73c) from German (cf. Moltmann 1997, Link 1998, Zimmermann 2002). In each case, an adnominal element in left-peripheral position inside its DP gives rise to a pluractionality effect.

(73) a. [4000 ships] passed through the lock.

= There are 4000 ship-event-pairs such that the event was a lock-passing by the ship.

b. [Different children] played in the garden and in the kitchen.

= The events of playing in the garden and playing in the kitchen involve different children.

c. [Jeweils ein Apfel] war verfault.

each one apple was rotten

‘Each time, one apple was rotten.’

Given (72) and given the present analysis of ICs and OCs as pluractionality markers, their position at the left edge of their DP is to be expected. The complex quantifier *an/the+occasional* can bind the VP-internal event variable from D (see fn.11). The universal quantifier *individual* can take scope over the existential event quantifier from Spec,DP (see fn.7).

To sum up, in this final section it was shown that ICs do not involve complex quantifier formation, despite their pluractional nature and despite their apparent similarity to OCs. Instead, the pluractionality marker *individual* was analyzed as moving to Spec,DP, thus instantiating the third option of giving a DP-internal element DP-external scope. *Individual* in ICs moves for semantic reasons. It cannot be interpreted in its base position, and it needs to take scope over the existential quantifier over events. More generally, (72) suggests that DP-internal elements can give rise to pluractionality effects by modifying the event structure of a clause iff they are located at the left edge of DP. OCs and ICs, then, form just another instance of adnominal elements that modify the ontological domain of events, which is usually associated with the verbal domain (cf. Parsons 1990). Similar phenomena of adnominal elements affecting the domain of events are attested cross-linguistically. In Finnish, the aspectual distinction between perfective and imperfective events is encoded adnominally through case (cf. e.g. Kiparsky 1998). Similarly, Leiss (2000) argues that the origin of the article in the Germanic languages was driven by the need to encode aspectual distinctions, the result of the loss of the perfective/imperfective distinction in the verbal domain. If so, the event domain seems to be accessible for adnominal elements in principle. Clearly, further work is required in order to determine the exact conditions on such accessibility.

7. Conclusion

In this paper, I have discussed two cases where a DP-internal adjective takes scope out of the DP. I argued that ‘occasional constructions (OCs)’ are formed by complex quantifier formation (CQF), with an adjective incorporating into a determiner. Citing evidence from German, I showed that CQF is attested independently, and that a complex quantifier analysis accounts for the difference in syntactic distribution between English and German OCs. I further argued that OCs are pluractionality

markers in the sense of Lasersohn (1995). This explains the restriction of OCs to infrequency expressions. Finally, I showed that an extension of the CQF-account to superficially similar 'individual constructions (ICs)' is problematic. As a result, ICs were argued to involve movement of the adjective *individual* to Spec,DP. The discussion showed that natural languages instantiate all three mechanisms of giving a DP-internal element DP-external scope, namely LF-extraction, CQF, and movement to Spec,DP.

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Notes

* This article is based on a shorter version, which appeared as 'Pluractional Quantifiers: The *occasional*-construction in English and German' in Strolovitch et al. (eds.), *The Proceedings of Semantics and Linguistic Theory (SALT)* X, Cornell University, Ithaca. 2000.

1. Matthewson (1998) assumes DP-quantifying elements to be adjoined to DP rather than to be located in Spec,DP.

2. The term 'infrequency' does not refer to the absolute number of occurrences of a particular event. A particular event-type can be instantiated infrequently even though the absolute number of its instantiations is large. Rather, the term 'infrequency' indicates that a considerable amount of time passes between each instantiation of an event.

3. The blocking effect does not occur with a number of speaker-oriented adjectives like *inevitable*, which do not modify the NP-denotation, but add an evaluation on the part of the speaker.

(i) The inevitable occasional sailor also strolled by.

4. Stump (1981: 222) cites some counterexamples to this restriction (his (7) and (20)):

(i) Mary paid her friend a frequent visit. (ii) John enjoys a frequent vacation in Palm Springs.

Possibly, the examples in (i) and (ii) are good because they involve event nouns. I consider sentences like (i) and (ii) to be exceptions to the restriction in the main text since many speakers of English consider them marginal at best.

5. In a way, (14a) is a hybrid between both approaches, since it also involves unselective quantification over events (cf. Doetjes 1997:231f. for discussion).

6. Furthermore, if OCCASIONAL is an intersective quantifier, both semantic representations in (14ab) will have the same truth-conditions. In 4.3, I will present arguments in favor of treating OCCASIONAL as intersective. See also 4.4 for further discussion of similarities and differences between (14a) and (14b).

7. Given Kayne's (1994:23) definition of asymmetric c-command, the raised adjective can c-command out of DP because it is located in the specifier position of a specifier.

8. Notice that not all definite DPs are necessarily specific and opaque. See the discussion of definite, but non-specific mass DPs in Fiengo & Higginbotham (1981:420).

9. This approach is neutral regarding the question at which syntactic level CQF applies. Intervening material at s-structure would also block CQF at LF due to the syntactic constraints to be discussed in the main text below. Phonological evidence, e.g. from cliticization, is equally unreliable as a diagnostic for overt incorporation because articles show a tendency to cliticize on the following NP in general. Of course, if Kayne's (1994) LCA is correct, CQF must take place at LF because the LCA only allows head-adjunction to the left.

10. I will not discuss complex quantificational elements consisting of indefinite article plus a nominal classifier (e.g. *a lot*, *a bunch*, *a heap*). Possibly these also involve complex quantifier formation, which would suggest that the process of CQF is productive with nominal elements as well.

11. I assume that whatever syntactic configuration licenses the binding of *his* in (21), licenses the binding of the event variable as well. An option would be to LF-move the quantifying element out of

DP to a position from where it can bind the event variable (cf. Heim's 1982 rule of Q-movement). Alternatively, and more in line with recent syntactic ideas (Chomsky 1995), one could assume a bare phrase structure in which the complex quantificational head projects directly.

12. More generally, other recent semantic analyses of definite determiners that do not treat them on a par with indefinites (e.g. Neale 1990, Heim & Kratzer 1998) seem unable to explain why OCs are restricted to *the* and *a(n)* (and bleached *your*). As pointed out by an anonymous reviewer, the fact that OCs can be formed with definite and indefinite determiners alike may actually constitute evidence for the analysis in Heim (1982).

13. See Pafel (1994) for other examples of complex determiners in German, e.g. *die meisten* (the-most) 'most'. Note that the core meaning of the superlative adjective *meisten* 'most', 'the largest quantity / number / degree of s.th.', is retained in the complex quantifier.

14. (27b-d) are not outright ungrammatical. They are deviant because the only possible reading, the attributive reading, does not make sense in connection with temporally stable entities such as houses and women. Given a suitable context, the attributive reading may allow for a meaningful construal after all. Think of a transgender or crossdressing context for the occasional woman in (27c).

15. The QP-analysis of OCs predicts English OCs to occur in every position to which QR can independently apply. Since QR can apply in (ii), giving the *every*-QP wide scope, the degraded status of (i) is surprising:

(i) ?* A guard was standing in front of the occasional building.

(ii) A guard was standing in front of every building.

I assume that (i) is bad because the meaning of *occasional*, requiring sequencing in time, does not match the presentational simultaneity of (i), expressed by the progressive. Sentence (i) improves if we substitute *occasional* with *odd*, which seems the preferred choice in presentational contexts:

(iii) A guard was standing in front of the odd building.

16. This explanation for the absence of VP-internal OCs in German is at odds with recent minimalist assumptions that all arguments leave VP at LF for reasons of Case checking (e.g. Chomsky 1995, ch.3). If so, they should always be able to bind the VP-internal event variable at LF. I can offer no solution compatible with standard minimalist assumptions, but see e.g. Sportiche (1990) for an

account that locates the Case-position of direct objects inside VP. Alternatively, it may be that the event argument is located above the Case positions.

17. Inverse scope readings seem possible with direct and indirect objects in Finnish (cf. Kaiser 2000:10). In any event, the observation that objects cannot take inverse scope over subjects is consistent with the assumption that quantified objects do not leave the VP in Finnish.

18. Sentences (30bc) are not marked as deviant because the adjective *satunnainen* seems to have an alternative (lexical) interpretation, on which it means something like 'random'. Consequently, (30b) is interpretable as meaning 'PAGAD chose *one* random building, and (30c) as meaning 'Jukka gave flowers to *one* random woman'.

19. We could mend this problem and uphold the strong quantifier analysis by assuming a semantic structure like (i), which correctly predicts (33) to be true in both situations sketched in the main text.

(i) INFREQ<e> [part-of(e,e*)]: ∃x customer'(x,e) & greet'(we, x, e)

= 'Few events e are such that there is a customer x, and we greet x in e.'

But by doing so, we would lose the isomorphy between syntactic and semantic structure because the denotation of the NP-complement of the quantifier is not mapped to the restriction of the latter, but to its nuclear scope. See section 4.4 for more discussion.

20. See Dekker (1997) for a comparison of the two approaches.

21. Notice that OCs also exist with individual-level predicates, which do not allow for LF-reconstruction of the subject into VP (cf. Diesing 1992).

22. An anonymous reviewer points out that it does not seem appropriate to analyze the quantifier in (i) as quantifying over pairs of events and pictures when *take a picture* is interpreted quasi-idiomatically as meaning 'engaged in photography'.

(i) John took an occasional picture. = Occasionally, John was engaged in photography.

The absence of pair-quantification seems to be due to the fact that the NP *picture* does not contribute an individual variable on the idiomatic reading.

23. To be sure, the analysis sketched in (43) deviates from LDL's analysis (cf. ibid.: 18) in a number of ways. In LDL's minimalist analysis, *HAVE* cannot check the accusative case on the object. Rather, case checking is brought about by a number of derivational steps: (i.) the entire embedded VP moves to embedded Spec,CP; (ii.) *HAVE* moves out of VP (in Spec,CP) and incorporates into the matrix

verb; (iii.) the verb complex moves to AgrO; (iv.) the embedded object moves on to Spec,AgrOP. In the non-minimalist account sketched here, it may be enough to treat silent *HAVE* like its overt counterpart and let it assign accusative case to the embedded object. This would solve the case problem. What remains vague is the motivation for the embedded object to move to Spec,CP of the infinitival clause. On the other hand, the motivation for the movement of the embedded VP to Spec,CP remains equally vague in LDL's analysis (ibid.: 19).

24. (44b) predicts (44a) to be true in a situation in which sailor x1 strolled by three times in an hour, and in which nobody else strolled by in that hour (<e1,x1>,<e2,x1>,<e3,x1>). Although this situation satisfies the truth conditions in (44b), an utterance of (44a) does not seem to be felicitous in this situation. In my view, the infelicity is due to pragmatic factors. Notice that (i) can be felicitously uttered in a situation where the same ant walked by three times in an hour (and no other ant walked by), given that we have no means of verifying that it is the same ant.

(i) The occasional ant walked by.

The felicity or infelicity of utterances like (44a) and (i) seems to depend on our (in)ability to individuate the participating individual(s) from another. Unlike with ants, individuation is generally possible with sailors. This leads to a pragmatic blocking of (44a) by the more informative *Sailor X strolled by occasionally* in the situation described above.

25. The observation that '[…] if a sentence like *An occasional sailor strolls by* […] is true at an interval *i*, the subintervals of *i* at which *A sailor strolls by* is the case must be distributed throughout *i*, and not all clumped together', led Stump (1981:229) to treat complex determiners in OCs as frequency operators, and not as unselective quantifiers over cases (cf. Lewis 1975).

26. This claim is at odds with Moltmann's (1997:146) claim that '*[f]requent* implies that the members of the event group have some temporal distance from each other', which is based on examples like the following:

(i) a. John frequently wrote a story. (ex.1, p.142)

b. Mary's frequent nervousness makes her unsuited for continuous work. (ex.12a, p.146)

c. Mary was impressed by the frequent sunshine. (ex.7b, p.145)

In my view, temporal separation in all these examples is enforced by the (extra)-linguistic context. If only one agent is present, as in (ia), the actions performed by this agent must follow each other in

time. Similarly, our knowledge of the world tells us that Mary cannot suffer from two bouts of nervousness simultaneously (cf. ib). Third, instances of sunshine must be separated in time in a world with only one sun (cf.ic), but not necessarily so in a SF-world with two or more suns.

On the other hand, Moltmann does not discuss examples with plural subjects and plural objects as given in (54) and (55). As shown, it is these sentences that reveil the contrast in meaning between frequency and infrequency expressions. I conclude that frequency expressions can and – perhaps in the majority of cases – do serve to express a group of temporally separated events, as in Moltmann's (ia-c), but that they do not have to when the context allows for a temporal overlap of events.

27. This bipartition into strict temporal non-overlap readings and indeterminate, vague readings is reminiscent of the bipartition into distributive vs. indeterminate readings in sentences containing plural or quantified expressions (cf. Link 1997).

28. I take the event argument in the VP-denotation to be bound by existential closure at the VP-level.

29. I neglect other meanings of the apparently polysemic adjective *individual*, such as 'particular', 'different in a special way'.

30. The relevant type-shifting rule can be formalized as $\lambda W_{<et,et>}.\ \lambda x_{<e>}.\ \lambda P_{<e,t>}.\ W(P)(x)$. This operation of type shift may generally play a role in the (historical) process of grammaticalization of quantifying elements from modifying ones. For instance, the French quantifier *beaucoup* 'many, a lot' could be analyzed as being derived from an originally modifying or classifying element *beau coup* 'a good cup' (cf. Doetjes 1997:92 ff.) with the meaning $\lambda P \lambda x.\ quantity(x) = a\ lot \wedge P(x)$, with *P* indicating the nature of the substance. Incidentally, as discussed in Doetjes (1997), the French quantifier *beaucoup* resembles *individual* in exhibiting a similar switch in the order of arguments. When used adverbially, *beaucoup* takes a VP-denotation and a DP-denotation as its arguments. When used adnominally, it takes a DP-denotation and a VP-denotation as its arguments. Whatever the nature of the postulated reversal of arguments (see e.g. Doetjes' 1997 analysis in terms of categorial underspecification), I conclude that it is not restricted to *individual* in ICs.

31. The order of arguments of the adverb *individually* in (65) can be assimilated to that of *individual* in ICs in (70a) by treating the adverbial suffix *–ly* not as being semantically vacuous, but as providing the (pluralic) restriction for universal quantification (see Doetjes 1997:226f. for such a proposal). The suffix *–ly* can be taken to denote a variable over (groups of) individuals that gets its ultimate semantic

value under co-indexation with a lexical DP (see Zimmermann 2002 on how to interpret such structures).

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