NP Dependent Readings of *different*

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1. Introduction

This paper is concerned with constructions involving *different*, and in particular with data like (1) and (2):

(1)   Detmar and Kordula live in different cities.

(2)   Every girl read a different book.

The sentence in (1) has a reading that can be paraphrased as in (1'). The NP *Detmar and Kordula* determines which comparisons are made with *different*.

(1')   The city Detmar lives in is different from the city Kordula lives in.

Similarly, (2) has a reading that is paraphrased in (2'), where the universally quantified NP *every girl* determines what is compared with *different*.

(2')   Every girl read a book that was different from the book that every other girl read.

I will refer to these readings as NP-dependent readings of *different*. An obvious hypothesis is that the role of the NPs in (1) and (2) is the same, and that the same mechanism should bring about the NP dependent readings of the two sentences. This hypothesis has been pursued in the literature, in particular in Carlson (1987) and Moltmann (1992). One main point I will make in this paper is that there are differences between plural NP dependent readings and universal NP dependent readings that lead one to different analyses of the two. A first indication of this is the fact that German uses distinct lexical items (*anders* and *verschieden*) corresponding to English *different* in the two constructions, as illustrated by the translations of (1) and (2) given in (1") and (2"):

(1")   Detmar und Kordula wohnen   in   verschiedenen   Städten.
         Detmar and Kordula live   in   different   cities

(2")   Jedes Mädchen   hat   ein   anderes   Buch gelesen.
         every girl   has   a   different   book read

I will argue more specifically against certain aspects of Carlson's proposal, in particular. He would assign to (1) and (2) (on the relevant reading) roughly the LFs given in (3a,b).

(3)   a.   [different cities x] (λx[Detmar and Kordula live in x])

        b.   [a different book x] (λx[every girl read x])

The idea is that the licensing NP has distributive force and pluralizes an event. It is such pluralized events that *different* operates on. Hence, (3a) should be read as

something like 'there is a plurality of events of Detmar and Kordula living somewhere, and those events occur in different cities'. Notice that the NP containing *different* takes scope over the licensing NP in both (3a) and (3b).

We will see that the plural NP dependent reading does not seem to be a case of one of the NPs taking scope over the other at all, not being sensitive to the usual constraints on scope. Rather, the crucial factor here is plurality. In contrast, scope is a relevant notion in the case of the universal NP dependent reading. However, the empirical evidence indicates that the universal NP needs to take scope over *different*, and not the other way around.

The structure of the paper is as follows. In section 2, I will examine the linguistic contexts in which *different* can occur, and the readings they license. We will see a clear distinction between the *anders* correlate of *different* and the *verschieden* correlate. The conceptually simplest cases are those in which syntax provides an overt item of comparison. I will take those as my starting point and propose semantic analyses of *anders* and *verschieden* in section 3. Section 4 uses the semantics of *verschieden* in conjunction with a partially pragmatic analysis of plural predication to explain the plural NP dependent reading. This predicts plurality to be a crucial factor concerning the availability of those readings, a prediction examined in section 5. The data show a clear contrast between plural and universal NPs, supporting my view that the respective readings are licensed in different ways. In section 6 I come back to the universal NP dependent reading. I use the semantics of *anders* from section 3 in terms of a comparison operator to present an analysis of the universal NP dependent reading. This finds further support from parallels to comparatives. I conclude that two distinct but independently motivated semantic analyses of *different* suffice to derive the NP dependent readings. There is no need to postulate a special event related semantics for *different* to cover the NP dependent readings, whose uniformity is actually undesirable.

2. Different *differents*

2.1. *Overt Items of Comparison*

Intuitively, *different* makes a comparison between individuals, and states either non-identity of individuals or non-identity of the kinds they belong to. This is most obvious in cases where there is an item of comparison provided in the syntax. English can do this either with a *from*-phrase as in (4) or with a *than*-phrase as in (5):

(4)   Our last car was different from this one.

(5)   Luise had a different example than this one.

(5) can be translated into German either as in (6) using *verschieden*, or as in (7) using *anders*.

(6)   Luise   hatte   ein   von   diesem   verschiedenes   Beispiel.
        Luise   had   a   from   this   different   example

(7)   Luise   hatte   einen   anderes   Beispiel   als   dieses.
        Luise   had   a   different   example   than   this

2.2. *No overt item of comparison*

When there is no overt item of comparison, there are various possibilities for the interpretation of *different*, i.e. for how to determine the things to be compared. (8) has an interpretation I will call **discourse anaphoric**: the sentence means that Frank bought a book that is different from some previously mentioned or otherwise salient book.

(8)   Frank bought a different book.

The sentence in (9) also has such a reading; in addition we get a **reciprocal** interpretation: Frank likes books that are different from each other.

(9)   Frank likes different books.

Finally, there are the **NP dependent** readings that are the main issue of this paper. (10), with a dfinite plural NP, can mean that the books that Frank bought are different from the books that Bärbel bought. And (11) with a universal NP can mean that every boy bought a book that is different from the book that every other boy bought. In addition, (10) has a reciprocal and a discourse anaphoric reading, and (11) has a discourse anaphoric reading. I will refer to the universal NP dependent reading also as the **Q-bound** reading, following Johnson (1996).

(10)   Frank and Bärbel bought different books.

(11)   Every boy bought a different book.

Interestingly, German allows the discourse anaphoric reading and the Q-bound reading only with *anders*. The translations of (8) and (11) given in (8') and (11') that use *verschieden* are in fact ungrammatical.

(8')	Frank	hat	ein	anderes (*verschiedenes)		Buch	gekauft.
	Frank	has	a	different		book	bought

(11')	Jeder	Junge	hat	ein	anderes (*verschiedenes)	Buch	gekauft.
	Every	boy	has	a	different	book	bought

This is because *verschieden* without an overt item of comparison, when it occurs NP internally, cannot be singular. We will find an explanation for this later. Notice, however, that even if we replace the singular NP *ein verschiedenes Buch* with the corresponding plural *verschiedene Bücher*, we cannot get a discourse anaphoric or Q-bound reading. We can only get a reciprocal interpretation.

(8")	Frank	hat	verschiedene	Bücher	gekauft.
	Frank	has	different	books	bought

(11")	Jeder	Junge	hat	verschiedene	Bücher	gekauft.
	Every	boy	has	different	books	bought

On the other hand, a reciprocal interpretation as well as a plural NP dependent reading is only possible with *verschieden*. (9') and (10') are grammatical with *anders*, but as the '#' indicates, they don't have the relevant reading. Both are understood discourse anaphorically.

(9')   Frank   mag   <u>verschiedene (#andere)</u>   Bücher.
        Frank   likes   different   books

(10')   Frank und Bärbel   mögen   <u>verschiedene (#andere)</u>   Bücher.
        Frank and Bärbel   like   different   books

Hence, German has two clearly distinguished lexical items where English has
different. My strategy is to treat this distinction as real, that is, I assume that it
corresponds to a genuine semantic distinction. I will give a semantic analysis of
both *anders* and *verschieden*, and I assume that English *different* simply has both
possibilities. I regard the data with an overt item of comparison as the basic case
and take them as my starting point. The semantics I suggest for them will generalize
to the other cases.

3.   Overt Items of Comparison

3.1. 'verschieden' with Item of Comparison

The semantically most trivial case is something like (12):

(12)   Our last car was different from this one.

I translate *different* into a constant different' whose meaning is sketched in (13) (I
simplify in ways that I take to be irrelevant for the point of the paper).

(13)   [[different']] (a,b) = 1 iff (i) or (ii):

    (i) $a \neq b$

    (ii)   a and b belong to kinds a' and b', and $a' \neq b'$

This is what I take to be the semantic contribution of *verschieden*. It is simply a
relational adjective like *proud*. Hence (12) will be translated as in (14) - I generally
ignore tense, intensionality etc. and simplify translations as far as possible.

(14)   different'(our_last_car',this_one')

(15)   *verschieden von, different*   --> $\lambda y \lambda x[\text{different'}(x,y)]$

If this is the meaning of *verschieden*, we expect the *von*-phrase to have to denote
itself the object whose identity is being compared. This is correct, as (16) and (17)
show. When the item of comparison is not the object whose identity we compare,
we have to use *anders* plus *als*-phrase.

(16)   a.   Luise hat   heute   eine   <u>andere</u> Katze gefüttert als gestern.
               Luise has   today   a   different cat   fed   than yesterday
       b. *   Luise hat   heute   eine   von   gestern <u>verschiedene</u> Katze
               Luise has   today   a   from   yesterday   different cat
               gefüttert.
               fed

'Luise fed a different cat today than yesterday.'

(17)	a.	Luise hat	ein	<u>anderes</u>	Buch	gelesen als	Griselda.
		Luise has	a	different	book	read than	Griselda
	b. *	Luise hat ein	von	Griselda <u>verschiedenes</u>		Buch	gelesen.
		Luise has a	from	Griselda different		book	read

'Luise read a different book than Griselda.'

3.2. *'anders' with Item of Comparison*

As (16) and (17) already indicate, *anders + als* behaves more like a comparative, in that the item of comparison is able to provide a more indirect description of the object that is going to be compared. In fact, we find the ambiguities familiar from comparatives also with *different*: in the same way that (18b) is ambiguous between (20a) or (20b), (18a) can mean either (19a) or (19b).

(18)   a.   Luise met a different man than Otto.
        b.   Luise met a taller man than Otto.

(19)   a.   Luise met a man who was different from Otto.
        b.   Luise met a man who was different from the man Otto met.

(20)   a.   Luise met a man who was taller than Otto.
        b.   Luise met a man who was taller than the man Otto met.

In (21), I give examples without an overt item of comparison. Both with the comparative and with *different*, we get an interpretation that amounts to what I have called discourse anaphoric.

(21)   a.   Luise saw a different movie.
        b.   Luise saw a better movie.

A final parallel to comparatives I would like to mention is an odd restriction on determiners of NPs containing a comparison operator. As (22) indicates, only indefinite NPs are grammatical. This is not because the resulting interpretation would not make sense: I provide a paraphrase of what (22b) would mean with *every* in (22c). This amounts to the proposition that the easiest problem that Charles solved was harder than the easiest problem that Emily solved - not an interpretation that is intuitively available in (22b).

(22)   a.   Charles solved a harder problem than Emily.
        b. *   Charles solved every harder problem/most harder problems than Emily.
        c.   The degree d such that every problem Charles solved was d-hard is greater than the degree d' such that every problem Emily solved was d'-hard.

Interestingly, the same constraint can be observed with *different*, cf. (23a) vs. (23b). While comparing individuals might indeed not make much sense here, the kind-comparing interpretation of *different* would amount to the prefectly sensible (23c).

(23)   a.   Charles solved a different problem than Emily.
        b.   *   Charles solved every different problem/most different problems than
                   Emily.
        c.   The kind x such that every problem Charles solved was of kind x
                   was different than the kind y such that every problem Emily solved
                   was of kind y.

I will not offer an explanation for this effect. The following is what I take to be the
relevant generalization: a comparison operator cannot be contained in an NP headed
by a quantificational determiner if it needs to take scope over the determiner. See
e.g. Lerner (1992,1993) and Lerner and Pinkal (1995) for discussion of the
comparative data.
        The parallels we observe indicate that one would want to look for a semantic
analysis of *different* that captures the similarity. In fact, Heim (1985) extends her
analysis of phrasal comparatives to *different* with *than*-phrases. I will now briefly
introduce this analysis, and in section 6 use it to account for the Q-bound reading.
        A sentence like (24a) should mean something like (24b): there is a degree d
such that Luise owns a d-big car, and d is greater than the largest degree d' such
that Otto owns a d'-big car.

(24)   a.   Luise owns a bigger car than Otto.

        b. $\exists d \exists x[car(x)$ & $owns(Luise,x)$ & $d\text{-}big(x)$ &

                    $d > max(\lambda d' \exists y[car(y)$ & $owns(Otto,y)$ & $d'\text{-}big(y)])]$

Heim suggests that the comparative morpheme is a relation between a pair of
individuals and a relation between an individual and a degree, as defined in (25).

(25) $[[\text{-er'}]] (x,y) (D_{<e,<d,t>>})$ iff $\exists d[D(x)(d)$ & $d > max(\lambda d'[D(y)(d')])]$

(24a) would then have a Logical Form like (26). We compare Luise and Otto with
respect to how big a car they own.

(26) $\text{-er'} (Luise, Otto) (\lambda z \lambda d \exists y[car(y)$ & $owns(z,y)$ & $d\text{-}big(y)])$

Analogously, (27a) means something like (27b): there is a car that Luise owns, and
that is different from the car that Otto owns (I use the maximality operator here to
capture uniqueness for the singular case).

(27)   a.   Luise owns a different car than Otto.

        b. $\exists x[car(x)$ & $owns(Luise,x)$ &

                    $different'(x, max(\lambda y[car(y)$ & $owns(Otto,y)])]$

The comparison operator associated with *different*, which I call *anders'* here,
expresses a relation between a pair of individuals and a relation between two
individuals, as defined in (28).

(28) $[[\text{anders'}]] (x,y) (R_{<e,<e,t>>})$ iff

                    $\exists u[R(x)(u)$ & $different'(u, max(\lambda v[R(y)(v)])]$

Hence, (27a) has (29) as its Logical Form. We compare Luise and Otto with respect
to what car they own.

(29)   anders' (Luise, Otto) (λzλv[car(v) & (owns(z,v)])

Thus, I propose that there are two different *differents*. One (*verschieden*) denotes a relational adjective, the other (*anders*) is a comparison operator. The plot is to reduce the other cases to those basic ones. In particular, I will give an analysis of the Q-bound reading in which I use the *anders*-different, the comparison operator, and an analysis of the plural NP dependent reading in which I rely on the *verschieden*-different, the relational adjective. I discuss *verschieden* in the next section.

4. No Overt Item of Comparison: *verschieden*

4.1. Reciprocal 'different'

We have already observed that one reading of (30a) and the only reading of (30b) is the reciprocal (30c):

(30)   a.   London and Pfrondorf are different.
        b.   London und Pfrondorf sind verschieden.
        c.   London and Pfrondorf are different from each other.

Compare this to (31a,b), where the same thing happens: when one argument slot of a relation is not overtly realized, we get a reciprocal interpretation with respect to that argument slot.

(31)   a.   The children were separated.
        b.   The children were separated from each other.

Other relation-denoting expressions that illustrate this phenomenon would be the verbs *compare* and *meet*, and the adjective *similar*. I have nothing to say about this process. I simply assume that the covertly reciprocal data are analogous to the corresponding overtly reciprocal ones, that is, I treat (30a) and (30c) as identical.
      I will now introduce a specific semantic analysis of reciprocity, that of Schwarzschild (1996). The aspect of his proposal that is important to me is that it leaves room for pragmatics to determine which individuals stand in a reciprocal relation. This will be used in my analysis of the plural NP dependent reading: I propose to reduce it to a special case of a reciprocal interpretation.
      Schwarzschild formalizes (32a) as (32b):

(32)   a.   The children like each other.

        b. $\forall$y[y⊂[[the_children]] & y ∈ Cov
                              => like(y)(EachOther([[the_children]])(y)]]

(32b) contains two free variables, *Cov* and *EachOther*. *Cov* is a variable ranging over covers of the universe of discourse - a definition of cover is provided in (33).

(33)   C is a cover of P iff
              C is a set of subsets of P
              Every member of P belongs to some set in C
              { } is not in C

For our purposes a cover is a division of the individuals in the universe of discourse into salient subgroups. *EachOther* is a variable over functions from pairs of individuals to individuals. The values for both free variables are contextually determined. Thus, (32b) means that all salient subgroups of the children y like whatever the function EachOther assigns to the children and y. Obviously, we need some restrictions on what EachOther can assign to such pairs <[[the children]],y>: it has to be a subgroup of the children, and it has to be different from y (we don't want the reflexive part of the relation to be able to make the reciprocal statement true). These restrictions are given in (34) (i) and (ii).

(34)   For all M, g:
   (i) $\forall a \forall b[[[EachOther]]^{M,g}(a)(b) \subset a$
   (ii) $\forall a \forall b[[[EachOther]]^{M,g}(a)(b) \neq b$
   (iii) $\forall a$:the domain and range of $[[EachOther]]^{M,g}(a)$ are identical to Cov

In addition, I will assume (34) (iii) (discussed by Schwarzschild also). It amounts to the suggestion that there is only one salient division of the entities in the universe of discourse into subgroups. Hence (32b) means something like (35):

(35)   For each relevant subgroup y of the children: y likes a child or children different from y.

Various aspects of this proposal are not directly relevant to what I want to do. This concerns in particular the way the reciprocal relation of 'other-liking' is determined, i.e. the use of the EachOther function. What is important to me is that this reciprocal relation holds between groups in a partition of the anaphoric antecedent of the reciprocal that is determined by context, since this allows the contextual influence crucial to the derivation of the plural NP dependent reading. (36a,b) provide motivation for this aspect of Schwarzschild's proposal:

(36)   a.   The people in that building come from different but bordering countries. Not surprisingly, they hate each other.
        b.   The people in that building are on varying rent schedules, depending on when they first came into the building. Not surprisingly, they hate each other.

(36a) is naturally taken to mean that people hate people from other countries, and (36b) is naturally taken to mean that people hate people on different rent schedules. Both times, the anaphoric antecedent of the reciprocal, *they*, refers to the same group of people. The different meanings come about by the reciprocal relation of 'other-hating' being sensitive to different partitions of that anaphoric antecedent. Those partitions are provided by the preceding linguistic context. This illustrates the influence of pragmatics on reciprocal interpretation, and motivates the cover variable that takes this into account on Schwarzschild's analysis of reciprocity.
        (37) and (38) are provided for illustration as to how this applies to reciprocal *different*. In (37), it turns out that due to the restrictions on EachOther, the only cover over London and Pfrondorf is the one in (37d), hence (37b) (our Schwarzschildian formalization of (37a)) amounts to (37c), the desired meaning. In (38), notice that when *different* occurs within an NP, the anaphoric antecedent of the reciprocal is the subject variable of the NP. This explains why data like (39) with a singular *different* NP are ungrammatical in German (and don't have a reciprocal interpretation in English).

(37)   a.   London and Pfrondorf are different (from each other)

   b.   ∀y[y⊂[[London and Pfrondorf]] & y ∈ Cov
            => different(y)(EachOther([[London and Pfrondorf]])(y)]]

   c.   ∀y[y=London or y=Pfrondorf
            => y is different from the other of London and Pfrondorf

   d.   Cov[London and Pfrondorf]={{London}, {Pfrondorf}}

(38)   a.   Luise saw different (from each other) movies.

   b.   ∃X[movies(X) & Luise saw X & X are different from each other]

   c.   ∃X[movies(X) & Luise saw X & ∀y[y⊂X & y ∈ Cov
            => different(y)(EachOther(X)(y)]]

(39)   *   Hans hat   ein   verschiedenes   Buch   gelesen.
           Hans has   a   different   book   read
           'Hans read a different book.'

4.2. Plural NP Dependent Readings

We are now equipped to analyze the plural NP dependent reading. Recall that we
need to derive an interpretation for (40a) that can be paraphrased as (40b). What we
have said so far makes (40a) equivalent to (40c).

(40)   a.   Frank and Bärbel read different books.
   b.   The books that Frank read are different from the books that Bärbel
        read.
   c.   Frank and Bärbel read books that are different from each other.

In (41), I have formalized (40c)=(40a), first somewhat sloppily ((41a)), and in
(41b) making use of Schwarzschild's analysis of reciprocity. Notice that we need to
pluralize the relation *read* to apply also to plural objects. I have chosen to pluralize
via cumulating the relation, as the ** operator indicates. Cumulation is defined in
(41c) (cf. Sternefeld (1997)).

(41)   a.   ∃X[books(X) & **read(F&B,X) & X are different from each other]

   b.   ∃X[books(X) & **read(F&B,X) & ∀y[y⊂X & y ∈ Cov
            => different(y)(EachOther(X)(y)]]

   c.   **R is the smallest relation R' such that

        R'⊇R   and   if <a,b> ∈ R' and <c,d> ∈ R', then <a&c,b&d> ∈ R'

(41b) says that there is a set of books that have been read by either Frank or Bärbel,
and all salient subgroups of those books are different from each other. What exactly
this means depends of course on the value of the cover variable. Suppose that
(restricting our attention to the set of books we are looking at), the cover was as
indicated in (42):

(42)   Cov[X] = {the books that Frank read, the books that Bärbel read}

Then, (41b) says that each element of the set in (42) is different from - well, the
other member of the set in (42). In other words, there is a set of books read by

Frank and Bärbel, and the ones read by Frank are different from the ones read by Bärbel. This is the plural NP dependent reading.

This means that the reciprocal interpretation captures the NP dependent reading as one particular cover choice. If it is plausible that such covers are salient, we have an analysis for the NP dependent reading in terms of reciprocity. I believe that those covers must be assumed to be salient quite independently of the analysis of *different*. Consider for example (43) with a 'normal' reciprocal:

(43)   Diane and William discussed books that complement each other.

The interpretation I have in mind is one in which the books that Diane discussed complement the books that William discussed (and vice versa). This is captured by the Schwarzschild analysis in (44), assuming that we have a cover as in (44c).

(44)   a. $\exists X[\text{books}(X) \ \& \ **\text{discuss}(D\&W,X) \ \& \ X \text{ complement each other}]$

         b. $\exists X[\text{books}(X) \ \& \ **\text{discuss}(D\&W,X) \ \& \ \forall y[y \subset X \ \& \ y \in \text{Cov}$
                     $\Rightarrow \text{complement}(y)(\text{EachOther}(X)(y))]$
         c. $\text{Cov}[X]=\{$the books that Diane discussed,
                                     the books that William discussed$\}$

Notice that for the availability of the 'Diane and William' dependent cover, the relation *discuss* needs to be understood cumulatively, just as in (41) *read* needed to be understood cumulatively to make the cover in (42) possible. (43)/(44) are parallel to (40)/(41)/(42), so if we need to assume the cover (44c) for the analysis of (43), the corresponding cover must be available to derive the plural NP dependent reading of (40). As far as I have been able to determine, it is generally the case that plural NP dependent readings track normal reciprocal covers. Hence I think that the covers we need to describe the plural NP dependent reading in this way are needed independently, and that the conclusion is inescapable that this must be one way of getting the NP dependent reading.

I will make the stronger claim that this is the only way to get that reading. Evidence for this comes from the fact, for example, that the plural NP dependent reading is never the only possible reading of these sentences. A sentence like (40a) always also has a reading in which the books are different from each other along some other dimension, i.e. Frank and Bärbel each read books that are different from each other according to some independent criterion. We can capture this in terms of different cover choices. Moreover, a plural NP dependent reading is only possible when the NP containing *different* is plural. There is no such reading available in (45), for example, even though (40a) is compatible with Frank and Bärbel only having read one book each.

(45)   *   Frank und Bärbel   mögen   ein   verschiedenes Buch.
                   Frank and Bärbel   like   a   different   book
         #   Frank and Bärbel like a different book.

We predict this because the NP dependent reading is a reciprocal reading, hence (45) would have to be reduced to 'Frank and Bärbel like a book that is different from each other' - which of course is just as bad as 'John likes each other', the reciprocal having a singular antecedent.

5. Licensing Environments

5.1. Plural NPs

The analysis of the plural NP dependent reading I propose in the preceding section ties the availability of that reading crucially to factors of plurality (via reciprocity and cumulation). It does not tie it to scope, in the sense of one of the NPs needing to have scope over the other, since the plural NP is related to the *different* NP via the cover, that is by pragmatic means. More specifially, the plural NP determines which comparisons are made with *different* by making a particular cover salient. This cover in turn determines which entities are being compared, via the sensitivity of reciprocity to context, i.e. the cover. In this section I explore some predictions this makes concerning the linguistic environments that license such readings.

Since we don't need one NP to take scope over the other, plural NP dependent readings should for instance be possible when the two NP are separated by a scope island. Below I embed either the different NP or the plural NP inside a relative clause. (46) is an example where the plural NP is embedded. The sentence has a dependent reading, paraphrased in (46'a) and analyzed in (46'b). (46) on this analysis means something like: let's look at the largest entity that is a set of books each of which has been read by either Frank or Bärbel. The salient subgroups of this group are different from each other. If the salient subgroups are the books that Frank likes on the one hand, and the books that Bärbel likes on the other (as indicated in (46'c)), then this represents the plural NP dependent reading.

(46)   Die Bücher,   die   Frank und Bärbel   mögen, sind   verschieden.
        The books   that   Frank and Bärbel   like   are   different.
        'The books that Frank and Bärbel like are different.'

(46')   a.   The books that Frank likes are different from the books that Bärbel
                likes.

        b. $\forall y[y \subset max(\lambda X[books(X)$ & $**like(F\&B,X)]) $ & $ y \in Cov =>$

                $different(y)(EachOther(max(\lambda X[books(X)$ & $**like(F\&B,X)]))(y))]$

        c. $Cov[max(\lambda X[books(X)$ & $**like(F\&B,X)])]$
                $=\{$the books that Frank likes, the books that Bärbel likes$\}$

The reverse situation is also possible: we can get plural NP dependent readings when the *different* NP is embedded in a relative clause. An example is given in (47), and more data that have been noted in the literature are in (48).

(47)   Ottilie und Maria haben   Bücher   gelesen,   die   zu
        Ottilie and Maria have   books   read   that   to
        verschiedenen   Schlüssen   kamen.
        different   conclusions   came
        'Ottilie and Maria read books that came to different conclusions.'

(48)   a.   Those two gorillas saw women who fed different men.   [Dowty]
        b.   The men found books which discussed different topics.   [Carlson]

(47) can mean (49a), and is analyzed as in (49b). If we have the cover indicated in (49c), we get the NP dependent interpretation.

(49)   a.   The conclusion(s) that the book(s) that Ottilie read arrived at
             was/were different from the conclusion(s) that the book(s) that Maria
             read arrived at.

       b. $\exists X[books(X)$ & $**read(O\&M,X)$ and $\exists Y[conclusions(Y)$ &

             $**arrived\_at\ (X,Y)$ & $\forall y[y \subset Y$ & $y \in Cov$ -->
             $$different(y, EachOther(Y)(y)]]]$$

       c. $Cov[Y]$ = {the conclusion(s) that the book that Ottilie read arrived at,
             the conclusion(s) that the book that Maria read arrived at}

Importantly, we need to understand the relations in both the relative clause and the matrix clause as cumulated for this cover to be possible. Imagine that Ottilie and Maria had read the same books. It would be impossible to divide the books along the 'Ottilie and Maria' dimension, and accordingly, it would also be impossible to divide the conclusions in those books along the 'Ottilie and Maria' dimension. Thus we need to gather the books that have been read by either Ottilie or Maria in one set, i.e. cumulate the basic relation *read*, as well as cumulate *arrive-at*. Generally, the plural NP and the *different* NP have to be related via a series cumulated relations.

Since we predict this to be one parameter for the availability of this reading, let's see what happens if we interrupt the chain of co-arguments of cumulated relations. One way of doing this is to replace a plural link in the chain by a singular. Contrast (47) with (50).

(50)   Ottilie und Maria   haben ein   Buch   gelesen,   das   zu
       Ottilie and Maria   have   a   book   read   that   to
       verschiedenen   Schlüssen   kam.
       different   conclusions   came
       'Ottilie and Maria read a book that arrived at different conclusions.'

When the head noun of the relative clause is singular, the NP dependent reading is lost. Similar data have been noticed by Dowty (1985). We now have an explanation for this. The meaning of (50) is indicated in (51). If both Ottilie and Maria read the same book (and this is of course the only possibility with a singular), it is impossible to devide the books, and the conlusions, according to Ottilie and Maria. The cover required for the plural NP dependent reading is factually impossible. We can only choose covers independently of Ottilie and Maria.

(51)   a. $\exists x[book(x)$ & $O\&M\ read\ x$ and $\exists Y[conclusions(Y)$ & $x\ arrived\ at\ Y$

             & $\forall y[y \subset Y$ & $y \in Cov$ -->$different(y, EachOther(Y)(y)]]]$

       b.   Ottilie and Maria both read a book that arrived at conclusions that
             were different from each other.

Another way to disrupt cumulativity is to add a floating *each*. This forces a distributive interpretation, hence is incompatible with cumulation. Accordingly, (52) does not have an NP dependent reading.

(52)   Ottilie and Maria each read books that arrived at different conclusions.

The interference of a floating quantifier can actually be illustrated with simpler examples like (53). In those sentences also, of course, it is necessary that Frank and Bärbel didn't read the same books to begin with if we want to split up the set of books according to which of the two read them. German *beide* (like English *each*, but apparently not like English *both*, cf. Schwarzschild (1996)) seems to be

necessarily distributive, so (53) looses the NP dependent reading: the books have to be different from each other according to some other criterion. The English translation interestingly does have an NP dependent reading. This seems to be an instance of the Q-bound reading - compare (54), where I have replaced *verschieden* with *anders*, and where an NP dependent reading is possible (the change from Frank to Annette is so I have two feminine NPs, which is much nicer).

(53)   Frank und Bärbel   haben beide verschiedene Bücher gelesen.
       Frank and Bärbel   have   both   different   books   read
       'Frank and Bärbel each read different books.'

(54)   Annette und Bärbel haben jede andere Bücher gelesen.
       Annette and Bärbel have each different books read
       'Annette and Bärbel each read different books.'

The two ways to interrupt the cumulative chain work the same way with the mirror image data where we embed the plural inside a relative clause and have *different* upstairs. (55) has a singular head noun, and (56) has a relative clause that is distributive instead of cumulated. Neither has the NP dependent reading that we got without these interfering factors (cf. (46)).

(55)   Das Buch,   das Frank und Bärbel gelesen   haben,   kam   zu
       the book   that Frank and Bärbel read   have   came to
       verschiedenen Schlüssen.
       different   conclusions
       'The book that Frank and Bärbel read arrived at different conclusions.'

(56)   Die Bücher   die   die Jungen   beide mögen, sind   verschieden.
       the books   that   the boys   both   like   are   different
       'The books that the boys each like are different.'

5.2. *Universal NPs and Scope*

We have seen that plurality is a parameter in determining the availability of the plural NP dependent reading, supporting an analysis that recognizes plurality as a crucial factor. Now, such an analysis could not possibly be extended to the Q-bound reading, since there is no plural anywhere in those sentences. Fortunately, there is further support for my decision to treat the two NP dependent readings as different phenomena, in that the licensing contexts are clearly distinguished. Let's look at some contrasts.

(57a) is the familiar example with the plural embedded in a relative clause, where the dependent reading is possible. (57b), in contrast, where we have a universal instead of a plural, does not have an NP dependent reading.

(57)   a.   Die Bücher, die   Frank und Bärbel   mögen,   sind
              The books   that   Frank and Bärbel   like   are
              verschieden.
              different.
              'The books that Frank and Bärbel like are different.'
       b. # Die Bücher, die   jedes Kind   mag,   sind   anders.
              The books   that   every child   likes   are   different.
              The books that every child likes are different.

In (58) I list some data from Johnson (1996) and Carlson (1987) in which the universal NP is embedded either inside a relative clause or inside a finite complement clause. The '#' indicates that the Q-bound reading is unavailable.

(58)   a.   # A different girl met the man that everyone admired.   [Johnson]
        b.   # Different men said that John knows each magician.   [Carlson]
        c.   # A different girl claimed that Joe admired everyone.   [Johnson]

Johnson's (1996) generalization is that the Q-bound reading is only possible when the universal NP can take scope over *different*. The English double object construction is a good illustration of this. The first object seems to obligatorily take scope over the second object; accordingly, the Q-bound reading is possible when the universal is the first object, but not when it is the second object.

(59)   a.   I gave every girl a different marble.   [Johnson]
        b.   # I gave a different girl every marble.   [Johnson]

Compare (59) to (60), where instead of a universal we have a plural NP. The plural NP dependent reading is possible both with the first and with the second object.

(60)   a.   I gave different girls "Harnessing Peacocks" and "Knowledge of Language".
        b.   I gave Maria and Luise different books.

The data in (61) vs. (62) make the same point. In German, with a normal transitive verb like *buy*, a subject preceeding an object in the middle field obligatorily takes scope over the object (Frey (1993)). We expect a universal subject to be able to license a Q-bound reading, then, but not a universal object, and this is indeed the case ((61a) vs. (61b)). On the other hand, a definite plural NP can license an NP dependent reading as subject or as object ((62a) vs. (62b)).

(61)   a.   ...,   weil   jedes   Mädchen   ein   anderes   Buch
                     because every girl   a   different   book
                     gekauft   hat.
                     bought   has
        b. # ...,   weil   ein   anderes   Mädchen   jedes   Buch
                     because a   different   girl   every   book
                     gekauft   hat.
                     bought   has

(62)   a.   ...,   weil   verschiedene Mädchen   "Harnessing Peacocks"
                     because different   girls   "Harnessing Peacocks"
                     und   "Knowledge of Language" gekauft   haben.
                     and   "Knowledge of Language" bought   have
        b.   ...,   weil   Luise und Maria   verschiedene Bücher gekauft
                     because Luise and Maria   different   books bought
                     haben.
                     have

We do not expect a restriction on relative scope of NPs to affect the plural NP dependent reading in these cases, because we can have the two NP as co-arguments of a cumulated relation, and that's really all that is required in terms of semantics and Logical Form. I conclude that the factors that decide on the availability of our two NP dependent readings are - well, different. This justifies my view that we

should not give the same analysis to the Q-bound reading and the plural NP dependent reading.

6. Q-bound *different*

The plan is, then, to find an analysis of the Q-bound reading in which the semantic contribution of *different* is that of the comparison operator disussed in section 3. I suggest (63c) to represent the relevant meaning of (63a).

(63)   a.   Every girl read a different book.
        b.   Every girl read a book that was different from the book that every other girl read.

        c. $\forall x,y$[girl(x) & girl(y) & x$\neq$y -> x read a different book than y]

Interestingly, the Q-bound reading is not restricted to *different*: the comparative can do something very similar, as the data in (64) illustrate. Some minimal pairs are given in (65) and (66).

(64)   a.   Each subsequent apple was more succulent.
        b.   Susanne got more tired with every step.
        c.   Nutella gets more expensive every year.

(65)   a.

Otto hat	jedes	Jahr	ein	anderes	Auto	gekauft.
Otto has	every	year	a	different	car	bought

            Otto bought a different car every year.
        b.

Otto hat	jedes	Jahr	ein	größeres	Auto	gekauft.
Otto has	every	year	a	bigger	car	bought

            Otto bought a bigger car every year.

(66)   a.   She gave a better talk every time.
        b.   She gave a different talk every time.

A first rough semantics for (65) is given in (67), which should make the semantic similarity obvious. Q-bound readings thus seem to be something comparison operators can do, not really a speciality of *different*.

(67)   a. $\forall$t1t2[year(t1) & year(t2) & t1$\neq$t2-->
                Otto bought a different car in t2 than in t1]

        b. $\forall$t1t2[year(t1) & year(t2) & t1<t2 -->
                Otto bought a bigger car in t2 than in t1]

The question is of course how to derive these interpretations. The nuclear scope of the universal is fairly unproblematic: we can assume that the universal quantifier binds two variables which as a pair are the first argument of the comparison operator, as indicated in (68).

(68)   a.   every year [t1,t2]
                -er(t2,t1)(λtλd[Otto bought a d-big car in t])
        b.   every year [t1,t2]
                anders(t2,t1)(λtλx[car(x) & Otto bought x in t])

The restriction is harder. Let's ignore for a moment the conditions 't1<t2' and 't1≠t2', where the two sentences differ. Then the problem is that we need to quantify over a pair of years with *every year*. Even if we assume that *every* is an unselective binder, as has been argued for on the basis of data like (69), it is not clear how to acomodate the restriction on a second year-variable. I have not been able to resolve this and will leave it open.

(69)   Every woman who owns a donkey likes it.

Here is a part of the restrictor problem that I do have something to say about: the conditions 't1<t2' and 't1≠t2'. Notice that if we didn't have them, the sentences would be contradictions. Notice also that the comparative example would still be a contradiction if we had only 't1≠t2'. I suggest that the way these things get into the restrictor has nothing to do with compositional semantics. We accomodate the weakest condition that will make the sentence non-contradictory, thereby saving it as a useful contribution. That is, I suggest that we do something similar to what happens in (70):

(70)   Everybody has a faster computer than Douglas.

This has to mean that everybody other than Douglas has a faster computer than Douglas, even though Douglas is clearly around in the universe of discourse.
    Supposing that we can eventually resolve the pair question, the Logical Form of (63) looks like (71) according to those suggestions:

(71)   every girl [x,y]   [anders(x,y)($\lambda z \lambda v$[book(v) & read(z,v)])]

Obviously, the universal needs to scope over the comparison operator on this analysis, since it binds the two variables that are the first argument of the comparison operator.
    Notice that with the comparative case, it is clear that we are not comparing events. I suggest that the comparative Q-bound reading and the Q-bound reading of *different* should receive a parallel analysis; hence, since we need to derive a non-event related reading for the one, deriving such a reading for the other should come with no extra trouble. I take this to be a further argument in favour of using the regular comparison operator semantics of *different* in the Q-bound reading.
    I would like to point out one final desirable consequence of this analysis. Notice that Q-bound readings can only occur if the comparison operator is contained within an indefinite NP. Quantified determiners lead to ungrammaticality:

(72)   a.   She gave a better talk every time.
        b. #   She gave every better talk/most better talks every time.

(73)   a.   Every girl read a different book.
        b. #   Every girl read every different book/most different books.
        c.   For every pair of girls x,y: the kind d such that x read every book of
                kind d was different from the kind d' such that y read every book of
                kind d'.

I take this to be just one more example of the generalization discussed in section 3 that a comparison operator cannot be contained in a quantified NP it needs to take

scope over. Of course, it is only obvious how to reduce these data to the more general effects with comparison operators if we are dealing with the comparison operator *different* in these cases.

To summarize: I suggest that the two NP dependent readings of *different*, contrary to the first impression, are not one and the same phenomenon. As German helps us to see, one is an instance of a reciprocal use of a relational adjective, the other is particular use of a comparison operator. The mechanisms involved in deriving the NP dependent readings are very different. The first makes crucial use of plurality, and the fact that the interpretation of reciprocals leaves some room for pragmatics. We see that accordingly, plurality has an important influence on the availability of that reading, whereas scope doesn't. The Q-bound reading on the other hand shares properties of comparison constructions and requires the NP to take scope over the comparison operator. The readings are licensed in different environments, requiring us to give them different treatments. While the analysis of NP dependent readings I suggest is non-uniform in this sense, I use the ordinary meanings of *different* to account for the dependent readings also, a different (!) uniformity.

Acknowledgements

References

Carlson, Greg N. (1987). Same and Different: Some Consequences for Syntax and Semantics. Linguistics and Philosophy 10, 531-566.

Dowty, David (1985). A Unified Indexical Analysis of Same and Different, A Response to Stump and Carlson. Paper presented at the University of Texas Workshop on Syntax and Semantics, Austin, Texas, March 22-24, 1985.

Frey, Werner (1993). Syntaktische Bedingungen für die semantische Repräsentation. Über Bindung, implizite Argumente und Skopus. Studia Grammatica XXXV, Berlin, Akademie Verlag.

Heim, Irene (1985). Notes on Comparatives and Related Matters. Ms., University of Texas at Austin.

Johnson, Kyle (1996) Topics in Syntax. Lecture notes, University of Massachusetts, Amherst.

Lerner, Jean-Yves (1992). Quantorenanhebung bei Komparativkonstruktionen. Linguistische Berichte 140, 223-245.

Lerner, Jean-Yves (1993). Die Schachtelstruktur von Satzkomparativen. Linguistische Berichte 147, 383-408.

Lerner, Jean, Yves & Pinkal, Manfred (1995). Comparative Ellipsis and Variable Binding. In: Proceedings of the Fifth Semantics and Linguistic Theory conference (SALT 5), Cornell University.

Moltmann, Friederike (1992). Reciprocals and Same/Different: Towards a Semantic Analysis. Linguistics and Philosophy 15, 411-462.

Schwarzschild, Roger (1996). Pluralities. Kluwer, Dordrecht.

Sternefeld, Wolfgang (1997). Reciprocity and Cumulative Predication. Ms., Universität Tübingen.