

# Case Conflict in German Free Relative Constructions. An Optimality Theoretic Treatment

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ABSTRACT. Languages differ as to how big a case conflict must be in a free relative (FR) construction to cause ungrammaticality. While English requires true categorial matching, German allows the suppression of structural cases if assigned by the matrix verb. There are also different types of non-matching languages. Paradigmatic examples are Gothic and Modern Greek. Earlier generative syntactic accounts mainly propose a distinction only between matching and non-matching languages. This is not fine-grained enough to capture the typological findings. An optimality theoretic treatment permits a richer, but not infinite, typology, and it allows constraint violation (which obviously happens in FR constructions). The proposed account makes use of the optimality theoretic conception of *correspondence*. The assumed constraints are on input-output correspondence (input-LF as well as input-PF), and also on PF-LF correspondence.

## 1 Free Relative Constructions

A considerable amount of attention has been paid to free relative constructions in generative grammar in the last thirty years. Some interesting and puzzling properties make this construction worth examining. Free relatives have the somewhat paradoxical property of being clauses that stand for non-clausal constituents. The following example contains five such relative clauses:

- (1) **Wer sich mit freien Relativsätzen beschäftigt, verwendet, was von ihm dafür gehalten wird, sooft er kann, wann immer sich ihm dafür eine Gelegenheit bietet und wo immer er sich befindet.**  
≈ “Whoever deals with free relative clauses, uses what he considers to be one, as often as he can, whenever he has the opportunity and wherever he is”

This paper will not deal with adverbial clauses, such as the last three highlighted clauses in (1). I will concentrate on free relatives (FRs) that realise

an argument of a verb. And here again I will restrict myself mainly to case-marked complements, and widely ignore prepositional phrases. An important phenomenon is the so-called *matching effect* (Bresnan & Grimshaw 1978): in many languages the relative pronoun of the FR construction has to fulfil both the requirements of the FR internal verb, and those of the matrix verb. In German, the relative pronoun has to appear in the dative case if the FR stands for a dative argument of the matrix verb:

- (2) a. Ich folge wem immer ich vertraue  
 I follow who-DAT ever I trust  
 b. \*Ich folge wen immer ich bewundere  
 I follow who-ACC ever I adore  
 c. \*Ich folge wem immer ich bewundere  
 I follow who-DAT ever I adore

Both *folgen* and *vertrauen* assign dative to their object in (2–a); the relative pronoun *matches* these requirements and the clause is fine. This is not the case in (2–b), because the FR internal verb *bewundern* assigns accusative. Whichever of the two cases is chosen (i.e., dative or accusative) for the relative pronoun, the result is ill-formed. Examples like this seem to have led many researchers (starting with Groos & van Riemsdijk 1981) to conclude that German FRs require matching in general. As already observed by Pittner (1991, 1995, 1996), this is not the case.<sup>1</sup> The empirical generalisations about German FR constructions seem to me to be the following:

- The pronoun of the FR has to carry the case assigned by the FR internal verb.
- If the matrix verb assigns structural case (i.e. nominative or accusative) to the FR complement, it imposes no restrictions on the case of the FR pronoun at all in one variant of German (henceforth German A). Another variant, German B, does not allow an FR if the matrix verb requires accusative and the embedded verb nominative.
- If the matrix verb assigns oblique case (i.e., dative or genitive) to the FR complement, the FR pronoun has to carry exactly that case. This in turn only leads to well-formedness if the FR internal verb assigns the same case to the FR pronoun.

The following examples show that matrix nominative need not occur on the FR pronoun:

- (3) Uns besucht ...  
 Us visits ...
- a. wer Maria mag  
 who-NOM Maria-ACC likes
  - b. wen Maria mag  
 who-ACC Maria-NOM likes
  - c. wem Maria vertraut  
 who-DAT Maria-NOM trusts
  - d. auf wen Maria sich freut  
 on whom Maria SELF be-happy  
 'whoever Maria is looking forward to meeting'
  - e. wessen Maria sich erfreuen würde  
 who-GEN Maria SELF be-happy would  
 'whoever Maria would be happy about'
  - f. wessen Bücher Maria gefallen  
 who-GEN books-NOM Maria-DAT please  
 'whoever's books please Maria'

There is no big difference with the FR in sentence-initial position:<sup>2</sup>

- (4) a. Wer Maria mag, wird eingeladen  
 who-NOM Maria likes is invited
- b. Wen Maria mag, wird eingeladen  
 who-ACC Maria likes is invited
- c. Wem Maria vertraut, wird eingeladen  
 who-DAT Maria trusts is invited
- d. Auf wen Maria sich freut, wird eingeladen  
 on who Maria SELF be-happy is invited  
 'whoever Maria is looking forward to meeting is invited'
- e. Wessen Maria sich erfreuen würde, wird eingeladen  
 who-GEN Maria SELF be-happy would is invited  
 'whoever Maria would be happy to meet is invited'
- f. Wessen Bücher Maria gefallen, wird eingeladen  
 who-GEN books-NOM Maria-DAT please, is invited  
 'whoever's books please Maria is invited'

The situation is nearly the same with accusative as matrix case:

- (5) a. Ich erzähle, was immer mir gefällt  
 I tell what-NOM ever me-DAT pleases

- b. Ich lade ein, wen auch Maria mag  
I invite who-ACC also Maria likes'
- c. Ich lade ein, wem auch Maria vertraut  
I invite who-DAT also Maria trusts
- d. Ich lade ein, auf wen sich auch Maria freuen würde  
I invite on who SELF also Maria be-happy would  
'I invite whoever also Maria would be happy to meet'
- e. Ich lade ein, wessen sich auch Maria erfreuen würde  
I invite who-GEN SELF also Maria be-happy would  
'I invite whoever also Maria would be happy to meet'
- f. Ich lade ein, wessen Bücher auch Maria gefallen  
I invite who-GEN books-NOM also Maria-DAT please  
'I invite whoever's books please also Maria'

There is a controversy about data in which the relative pronoun carries nominative. For some speakers, the example in (6) is ill-formed (cf. Pittner 1991, 1995):<sup>3</sup>

- (6) (\*)Er zerstört, wer immer ihm begegnet  
he destroys who-NOM ever him-DAT meets

As far as I can see, there is a real disagreement among German native speakers about data like this. I found, however, that parallel examples like the following are easier to judge as well-formed:

- (7) a. (\*)Ich lade ein, wer mir sympathisch ist  
I invite who-NOM me-DAT nice is  
≈ 'I invite who I like'
- b. (\*)Er tötet, wer immer ihm begegnet  
he kills who-NOM ever him-DAT meets

But even those speakers who do not accept (6) and (7) accept (5-a). This must be due to the fact that the *wh*-pronoun for inanimates, *was*, is the same for both nominative and accusative.<sup>4</sup> This shows that the matching effect is not about a syntactic feature like 'abstract case', but about the morpho-phonological 'identity' of elements with not necessarily identical syntactic features.<sup>5</sup>

For those speakers, who accept (6) and the examples in (7), the patterns for matrix nominative and accusative are alike. This variant of German will be referred to as 'German A', and the one for which (6) and (7) are odd as 'German B'.

This is the only case in which the two variants of German seem to differ in their judgements of FRs.<sup>6</sup> If the case ‘assigned’ by the matrix verb to the free relative construction is an oblique case like dative<sup>7</sup> or genitive, then the relative pronoun has to appear in that case, and the verb inside the free relative also has to assign that case to the pronoun:<sup>8</sup>

(8) The matrix verb assigns dative to the FR:

- a. \*Ich vertraue, wer Hitchcock mag  
I trust who-NOM Hitchcock likes
- b. \*Ich vertraue, wen auch Maria mag  
I trust who-ACC also Maria-NOM likes
- c. Ich vertraue, wem Maria gefällt  
I trust who-DAT Maria-NOM pleases
- d. \*Maria hilft, wessen andere sich entledigen möchten  
Maria helps who-GEN others SELF rid want  
‘Maria helps whoever others want to get rid of’
- e. \*Maria hilft, wessen Eltern sie mag  
Maria helps who-GEN parents-ACC she likes
- f. \*Maria hilft, von wem sie eine Belohnung erwartet  
Maria helps from whom she a reward expects

(9) The matrix verb assigns genitive to the FR:

- a. \*Bodo entledigt sich, wer immer andere Ansichten hat als  
Bodo rids SELF who-NOM ever other opinions has than  
er  
he  
‘Bodo gets rids of whoever has different opinions than he’
- b. \*Bodo entledigt sich, wen immer Henkel nicht mag  
Bodo rids SELF who-ACC ever Henkel not likes
- c. \*Bodo entledigt sich, wem immer Gerhard mißtraut  
Bodo rids SELF who-DAT ever Gerhard mistrusts
- d. Bodo entledigt sich, wessen er nicht mehr bedarf  
Bodo rids SELF who-GEN he no longer needs
- e. \*Bodo entledigt sich, mit wem immer er einmal Streit hatte  
Bodo rids SELF with who ever he once argument had
- f. \*Bodo entledigt sich, wessen Einverständnisses er nicht bedarf  
Bodo rids SELF who-GEN agreement-GEN he not needs

In these cases, the pronoun must fulfil the case requirements of the two different verbs. This ‘matching effect’ is the most spectacular finding about free

relatives, and much of the work that has been done on them in generative grammar addresses the question of how to derive it.

The next section discusses the syntactic properties of FR constructions and various attempts to deal with them in generative syntax. None of the proposals suggested so far can derive the full range of typological variation in the way different grammars handle the case conflict that occurs in FR constructions. Most approaches predict that there are only matching and non-matching languages, but not that there are languages like German, that have non-matching with matrix structural case and matching with matrix oblique case, or languages with the pattern of Modern Greek.

In the third and fourth sections, I will develop an optimality theoretic account of the case conflict in German FR constructions. We will also see that it can deal in a much better way with typological variation.

## 2 The Syntax of Argument Free Relative Clauses

Two observations are crucial for the syntactic analysis of argument FRs:

- (10) I. They seem to obey the same selectional restrictions as **NP constituents**.  
 II. FRs resemble **relative clauses** and embedded ***wh*-clauses** in their internal structure and syntactic behaviour.

With respect to (10-I.), FRs behave like NPs or DPs, but with respect to (10-II.), they behave like CPs. The task for the syntactic analysis is to bring these two apparently contradictory observations together.

FRs differ from ‘normal’ relative clauses in that they do not seem to be ‘headed’, i.e., they do not seem to have an antecedent, as opposed to ordinary relative clauses:

- (11) a. **der**, den ich meine, steht dort drüben (*Rel.cl.*)  
           the-NOM the-ACC I mean stands there over  
       b.  $\emptyset$  wen ich meine, steht dort drüben (*FR*)  
           who-ACC I mean stands there over

### 2.1 The FR Pronoun

The two relative constructions in (11) use different pronouns. While the relative clause uses the ordinary *d*-pronoun as relative pronoun, the FR uses the

*wh*-pronoun. It is mostly impossible to use the *wh*-pronoun as relative pronoun in German:

- (12) \***der**,      **wen**      **ich** **meine** ...  
           the-NOM who-ACC I    mean

On the other hand, it is marginally possible to use the *d*-pronoun as FR pronoun. This was much better in earlier stages of German, but does not always appear odd, as (13-c) shows:

- (13) a. ?**der**      **mit dem** **Wolf** **tanz**t  
           the-NOM with the    wolf dances  
           ‘(the one) who dances with the wolf’  
       b. **wer**      **mit dem** **Wolf** **tanz**t  
           who-NOM with the    wolf dances  
       c. **wer/der**      **da**    **gerade** **mit dem** **Wolf** **tanz**t, **ist ein** **Freund**  
           who/the-NOM there just    with the    wolf dances is a    friend  
           **von mir**  
           of    mine

The *d*-pronoun is restricted to a definite interpretation, while the *wh*-pronoun can also have a generic and/or universal quantification reading.

Modern Greek has a specific FR pronoun that looks like a hybrid of relative and *wh*-pronoun (Alexiadou & Varlokosta 1995: 4):

- (14) a. **Potisa**      **pjos** **irthe**                    (*Question*)  
           asked-1Sg who came-3Sg  
           ‘I asked who came’  
       b. **Opjos**      **theli**      **erhete**                    (*FR*)  
           whoever-NOM want-3Sg come-3Sg  
           ‘Whoever wants, may come’  
       c. **Agorasa**      **to spiti**                    **pu/to opjo** **mu arese**    (*Rel.cl.*)  
           bought-1Sg the-house-ACC that/which me pleased  
           ‘I bought the house that I liked’

This evidence allows for a quite construction specific treatment of FR constructions: a large number of the specific features of FRs might be attributable to the lexical properties of FR pronouns. Not all languages need necessarily have their own genuine set of pronouns for FR constructions, just as, e.g., the relative pronoun in German is the same as the *d*-pronoun. Hence, the fact that German uses the *wh*-pronoun for FRs is no evidence that FRs are *wh*-clauses.

The pronouns introducing questions, FRs and relative clauses have in common that they occur in the operator position of an operator-variable chain. They are pronominal operators of different types. This difference should be expressed in terms of formal features. From the pattern of Modern Greek, we might conclude that the FR pronoun has features of both *wh*-pronouns and relative pronouns:<sup>9</sup>

(15)

TYPE	<i>wh</i>	REL
<i>wh</i> -pronoun	+	–
relative pronoun	–	+
FR pronoun	+	+

FRs and indirect questions are in complementary distribution. This can be shown by the addition of disambiguating items like *immer* ('ever', FR) and/or *alles* ('all', question):<sup>10</sup>

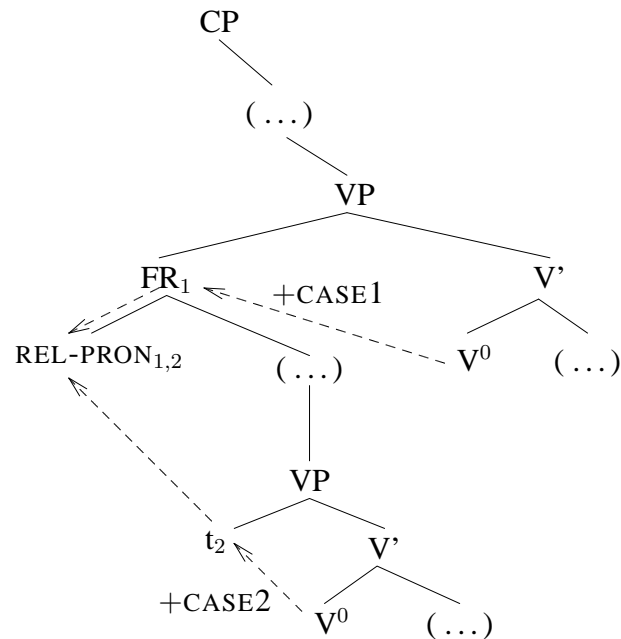
- (16) a. Ich möchte wissen, wer alles/\*immer kommt  
 I want-to know who-NOM all/\*ever comes
- b. Ich werde heiraten, wer \*alles/immer mich darum bittet  
 I will marry who-NOM \*all/ever me about-it asks

## 2.2 Variations of Non-Matching

The pronoun of the relative clause is sensitive to the case assigning properties of both the matrix verb and the relative clause internal verb. This can again be seen very clearly in Modern Greek (Alexiadou & Varlokosta 1995: 12f):

- (17) a. Agapo opjon/\*opjos me agapa  
 love-1Sg whoever-ACC/\*NOM me loves  
 'I love whoever loves me'
- b. Opjon/opjos piaso tha timorithi  
 whoever-ACC/NOM catch-1Sg FUT be-punished-3Pl  
 'Whoever I catch will be punished'

With the FR in postverbal position, the FR pronoun has to carry the matrix case, while both cases are possible when the FR is fronted. The relative pronoun of FR constructions is in a case conflict in postverbal position. The structural configuration of this conflict can be represented in the following way:

(18) **Case conflict**

CASE1 is the case assigned by the matrix verb to the FR and CASE2 is the case assigned by the verb inside the FR to the trace of the relative pronoun,  $t_2$ . Under the assumption that CASE1 percolates from the top node of the FR (which kind of category it actually is will be discussed below) to the FR pronoun, the pronoun is case marked twice. This is indicated by the numerical subscripts on the node REL-PRON. Examples like those in (17) show that the pronoun *can* realise either of the two cases. But that configurations like (18) need not necessarily lead to ungrammaticality, even if CASE1 and CASE2 differ, is already quite an unexpected fact: a single pronoun can carry only one case feature; the other case feature is not assigned, or at least not realised, and because of this, FR constructions should be defective. Obviously, they are not.

The grammar of Modern Greek handles this case conflict by suppressing the case assigned to the pronoun inside the FR for FRs in postverbal position.<sup>11</sup> This is the opposite of what happens in German, where the relative pronoun always has to carry the case assigned to the *wh*-pronoun by the FR internal verb. The phenomenon that relative pronouns realise a case from ‘outside’

of the relative clause is quite frequent in ancient languages like Gothic and Ancient Greek (cf. Harbert 1983). It has been termed ‘case attraction’.

Recall that German requires matching as soon as the matrix case assigned to the FR is oblique. One obvious explanation for this could be that only structural case may be ‘recoverable’ if ‘suppressed’, but not oblique case. What, then, happens in Modern Greek if the ‘suppressed’ case is an oblique one? Again, we observe something that differs from the usual pattern (cf. Alexiadou & Varlokosta 1995: 13):

- (19) Tha voithiso opjon tu dosis to onoma mu  
 FUT help-1Sg whoever-ACC cl-GEN give-2Sg the name my  
 \*opjou ‘whoever-GEN’  
 \*s’opjon ‘to whoever’  
 \*opjou tu ‘whoever-GEN him-GEN’  
 ‘I will help whoever you give (him) my name’

As usual, the pronoun carries the accusative assigned by the matrix verb, but in addition to that we have a pronominal clitic following the relative pronoun inside the FR that realises the genitive case assigned by the FR internal verb. The clitic can be seen as a resumptive element spelling out a trace of the relative pronoun in the sense of Pesetsky (1998).

Modern Greek has found a way to escape the case conflict by realising *both* case forms within the chain of the relative pronoun, thereby violating the restriction that a single chain should bear only one case feature.

A third type of non-matching language is Gothic, where, according to Harbert (1983), both attraction and non-attraction were possible ways of handling the case conflict. In this language, the relative pronoun systematically chooses the case form that is higher on the case hierarchy:

... the two types of free relative are in **complementary distribution**, the choice between them being determined by the relationship between the case appropriate to the matrix clause role of the construction and the case appropriate to the role of the missing argument in the lower clause. When the matrix case is to the right of the lower clause case on a hierarchy of the form Nom-Acc- $\left\{ \begin{smallmatrix} \text{Gen} \\ \text{Dat} \end{smallmatrix} \right\}$  it prevails [(20-a), attraction]. When it is to the left of the lower clause case the lower clause case prevails [(20-b), non-attraction]. ...  
 (Harbert 1983: 249)

- (20) ‘Optional’ attraction in Gothic (Harbert 1983: 248f):  
 a. jah þo-ei ist us Laudeikaion jus ussiggwaid  
 and Acc-Compl is from Laodicea you read

- ‘and read (the one) which is from Laodicea’ (Col. 4:16)
- b. þan-ei frijos siuks ist  
 Acc-Compl you-love sick is  
 ‘(The one) whom you love is sick’ (Joh. 11:3)

Any account of the syntax of FR constructions should be able to cover the typological fact that there are not just matching and non-matching languages, but also at least three different types of non-matching languages, as exemplified by German, Modern Greek and Gothic.

### 2.3 FRs as Bare CPs

Three different kinds of proposals for the structure of FR clauses can be distinguished:

- I. FRs have the structure of a DP or NP complemented by a CP or IP with the FR pronoun in  $D^0$  or  $N^0$ :  
 $[_{NP/DP} \text{FR-PRON } [_{CP/IP} \dots ]]$
- II. FRs have the structure of an empty DP or NP complemented by a CP with the FR pronoun in SpecCP:  
 $[_{NP/DP} \emptyset [_{CP} \text{FR-PRON } \dots ]]$
- III. FRs are CPs, with the FR pronoun in SpecCP:  
 $[_{CP} \text{FR-PRON } \dots ]$

The first proposal was made by Bresnan & Grimshaw (1978) and the second by Groos & van Riemsdijk (1981), the latter being a reply to the former. A variant of the second proposal that includes a treatment of case attraction was developed by Harbert (1983). The third analysis was proposed more recently by Rooryck (1994).

Rooryck shows that both DP–CP accounts face empirical problems. The structure under I. cannot deal very well with many of the extraposition properties of relative clauses in German and Dutch (this was first shown by Groos & van Riemsdijk), and the structure under II. wrongly predicts subjacency violations in cases of extraction out of the specifier of the CP. The usual syntactic tests show quite clearly that FRs behave like ordinary subordinate clauses (i.e. like CPs). The DP–CP proposals also require some construction specific stipulations and mechanisms in order to work.<sup>12</sup>

I will adopt several insights from the discussed approaches. These are basically the assumption that FRs are CPs (cf. Rooryck 1994), that case attraction

is a PF phenomenon (cf. Harbert 1983) and that the case hierarchy plays a crucial role in many languages (cf. Bresnan & Grimshaw 1978, Harbert 1983, Pittner 1991). But the basic account should be rephrasable with different syntactic analyses.

There are some further reasons, why I do not make use of one of the two proposals that claim that FRs are ‘headed’:<sup>13</sup>

- The ‘bare CP’ analysis is conceptually simpler, in that it only makes use of directly observable elements.
- If we assume that the FR pronoun is a pronoun of its own kind (cf. the evidence from Modern Greek, given in (14)), then it is possible to attribute most of the specific semantic properties of FRs to the pronoun itself, in a way analogous to relative pronouns and subordinate *wh*-clauses.
- Rooryck’s (1994) proposal that the C<sup>0</sup> head of the FR has an agreement function is sufficient to establish a configuration in which the FR pronoun carries a case feature that does not stem from its local domain, but from the matrix verb.

#### 2.4 The Case Hierarchy

Several observations about FRs in different languages can be explained with reference to a case hierarchy. Bresnan & Grimshaw (1978) already cite an unpublished manuscript by L. Carlson (1977, MIT) about the following Finnish data (cf. Bresnan & Grimshaw 1978: 373f):

- (21) a. Valitsen *mistä*                    *sinä pidät*  
           choose-I what-ELATIVE you like-you  
       b. \*Pidän *mitä*                    *sinä valitset*  
           like-I what-PARTITIVE you choose-you

Finnish FRs seem to resemble German ones in that the FR pronoun always takes the case assigned by the FR internal verb. Finnish can deal with some instances of case conflict: (21) shows that a matrix partitive may be suppressed if the embedded case is elative, but not vice versa. Bresnan & Grimshaw (1978: 374) cite Carlson as follows:

Carlson suggests that nominative (the case of subjects and objects of impersonal constructions), accusative, and partitive (the cases of objects of transitive verbs) are unmarked cases in Finnish; the case

of a free relative may disagree with that of its head only when the relative has unmarked case; and the head must agree in case with the subordinate verb that governs its trace.

Pittner (1991) claims that the following rule holds in German FR constructions:

Bei einem Kasuskonflikt zwischen dem vom Matrixverb geforderten Kasus K1 und dem vom Verb im freien Relativsatz geforderten Kasus K2 kann K1 unrealisiert bleiben, wenn K1 K2 auf folgender Hierarchie vorangeht:  
(KH) Nominativ < Akkusativ < Dativ/Präpositionalkasus <sup>14</sup>

I do not think that dative and PPs should be grouped together on the case hierarchy in general, but for German it does not seem to make an empirical difference.

Harbert (1983) proposed a similar case hierarchy for Gothic, as discussed in connection with the data in (20). Hierarchies of all kinds of features are quite common in optimality theoretic models. We could, e.g., develop a constraint family  $REALISE_{\langle case \rangle}$ , where ‘<case>’ stands for the different cases. The usual hierarchical ordering of these constraints in the OT model gives us the implementation of the case hierarchy:

$$REALISE_{PP} \gg REALISE_{DAT} \gg REALISE_{ACC} \gg REALISE_{NOM}$$

This hierarchy should, of course, be universally fixed and not freely rerankable.

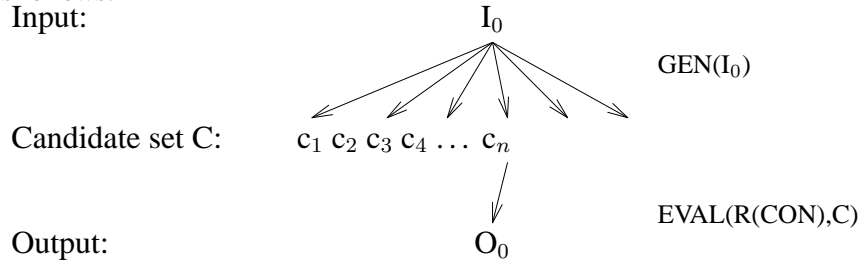
## 2.5 Case assignment at PF?

I will make use of Harbert’s (1983) intuition that case attraction is a PF-related phenomenon. In such cases, we obviously have a mismatch between the syntactic case feature of the FR pronoun (assigned by the FR internal verb) and its morpho-phonological case feature (‘assigned’ by the matrix verb). OT can deal with such rule violations. Whether such a candidate wins depends on the system of constraints and their ranking.

What is particularly interesting is that the formulation of the constraint makes reference to the notion of *correspondence*, which has become a fruitful topic of discussion in Optimality Theory. The correspondence here is that between a morpho-syntactic feature of a pronoun (at the relevant syntactic level of representation) and its corresponding morpho-phonological expression at the level of morpho-phonological representation, which, for ease of discussion, I will assume to be PF.

### 3 An Optimality Theoretic Analysis

The general architecture of optimality theoretic models can be schematised as follows:



I make the following assumptions about the components of this model:

- The standard proposal about the **INPUT** in OT syntax has been given by Grimshaw (1997a: 375f): “The *input* for a verbal extended projection is a lexical head plus its argument structure and an assignment of lexical heads to its arguments, plus a specification of the associated tense and aspect.” For the present discussion, it is important that the specific structure of the free relative clause is part of the input. I assume a version of the input that has been proposed by Keer & Baković (forthcoming) that also adds functional features to the elements in the input: “In addition to the lexical features, argument structure, tense and aspect of the Grimshavian input, we posit that there are functional features such as  $[\pm\text{COMP}]$  and  $[\pm\text{WH}]$ .” The FR pronoun and its formal features should also be present in the input. I assume that any functional features and projections might be included in the input. To be concrete: a free relative construction can already be distinguished from an ordinary headed relative clause construction at the input. This version of the input resembles a D- or S-structure much more than an unstructured set of lexical and functional items.
- The **OUTPUT** is a pair (LF, PF), as usual (not only) in the minimalist branch of generative syntax.
- **GEN** produces the candidate set on the basis of the input: “[**GEN**] ... generates all extended projections that conform to X-bar theory, that is, in which all projections are of the right basic structure. ... ” (Grimshaw 1997a: 376). I further assume that GEN can manipulate

the functional categories of the input. Contrary to Keer & Baković (forthcoming), I do not assume that GEN can perform manipulations on the values of features. I assume that GEN can only manipulate the distribution of features within the clause, and thereby add or erase functional projections. The motivation for this move will become clear in the next section.

- The Candidate set **C** is the set of possible output candidates, generated by GEN: (LF, PF) pairs that conform to universal well-formedness rules.
- **EVAL** is an evaluation algorithm based on the particular ranking **R** of the set of universal constraints **CON**. EVAL compares the candidates in **C** and chooses the best competitor as output.

### 3.1 Correspondence Theory

OT models are always theories about the relation (i.e. *correspondence*) between two different representations. These are mostly input and output. McCarthy & Prince (1995) a. o. show that in some cases it is also reasonable to assume correspondence between the outputs of two different competitions (output-output correspondence), and even further kinds of correspondences between different levels of representation. For our purposes, it is particularly interesting that the output of the OT syntax model in (21) is already a pair of two representations, LF and PF. The possibility of correspondence constraints between these two representations is straightforward and I will make use of it.

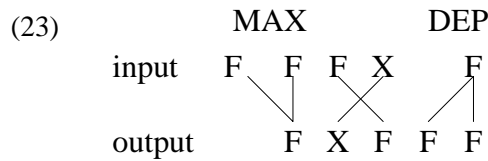
CON consists of two types of constraints: *markedness constraints* and *faithfulness constraints*. Markedness constraints allow the singling out of certain properties of (input-faithful) candidates as marked and thus the preference for candidates that differ from the input in this property. Faithfulness constraints allow the marking of a deviation from certain properties of the input in a candidate as disadvantageous compared to a faithful candidate. Very often the ranking of faithfulness and markedness constraints concerning a specific property decides whether the input-faithful or the input-deviant candidate wins.

Following McCarthy & Prince (1995), Grimshaw (1997b) lists the following two basic types of faithfulness constraints:

- (22) a. MAX: Every segment in the input has a correspondent in the output

- b. DEP: Every segment in the output has a correspondent in the input

The scheme in (23) illustrates the differences between these constraint families. A MAX constraint that applies to two elements in the input can be satisfied by a single element in the output. The opposite holds for DEP constraints. It is also less important whether segments are in the right order.



Thus, DEP and MAX constraints allow, say, ‘weak’ unfaithfulness. Consider the matching effect:

- (24) a. Ich helfe wem ich helfen will  
 I help who-DAT I help want
- b. Ich helfe einem, dem ich helfen will  
 I help one-DAT who-DAT I help want

Strictly speaking, we have two dative case features in (24–a), one assigned by the matrix verb, and the other assigned by the FR internal verb. But neither  $MAX_{DAT}$ , nor  $DEP_{DAT}$  are violated.  $DEP_{DAT}$  requires that for each dative feature in the output there is (at least) one in the input. This is the case; we have even more than one, but this is irrelevant.  $MAX_{DAT}$  requires that for each dative feature in the input there is one in the output. Again, this is the case – though it is the same dative feature of the output that corresponds to both dative features of the input.

This might help to explain the following problematic example discussed in Pittner (1995) and Leirbukt (1995):

- (25) a. Sagen Sie das bitte Frau Schwarzkopf, Herrn Müller, Herrn  
 tell you that please Mrs. S.-DAT Mr. M.-DAT Mr.  
 Schmidt und wen sie sonst noch treffen  
 S.-DAT and who-ACC you else yet meet  
 ‘Please tell that to Mrs. S., Mr. M., Mr. S. and whoever else you  
 might meet’
- b. \*Sagen Sie das bitte, wen Sie sonst noch treffen  
 tell you that please who-ACC you else yet meet

The obvious problem is the well-formedness of (25-a) in spite of the ill-formedness of (25-b). There is no violation of  $MAX_{DAT}$  or  $DEP_{DAT}$  in (25-a) if we assume that in a conjunction structure only the first conjunct is relevant for case checking issues. Evidence for this assumption might be given by the fact that a reversal of the two conjuncts leads to ill-formedness:

- (26) \*Sagen Sie das bitte, wen Sie treffen und Frau  
 tell you that please who-ACC you meet and Mrs.  
 Schwarzkopf  
 S.

The FR clause with an accusative pronoun, which normally is out when inserted for a dative marked complement, gets a ‘free ride’ in (25-a), so to speak: there is no case conflict, because the dative required by the matrix verb is realised by the DPs in the first conjunct. For a traditional account it is hard to explain why the accusative FR is possible in (25-a). But it might not be impossible.

### 3.2 Ungrammaticality

A problem that is never easy to solve in OT is absolute ungrammaticality. In an OT competition there will always be a winner. If all candidates in the candidate set for (27-b) are FR constructions, there should be an FR construction that wins and thus is well-formed.

- (27) a. Ich habe eingeladen, wem ich vertraue  
 I have invited who-DAT I trust  
 b. \*Ich vertraue, wen ich eingeladen habe  
 I trust, who-ACC I invited have

There are several ways to escape this problem. The way that I am choosing here is using not only FR constructions among the candidates, but also ordinary headed relative constructions. These are not input-faithful, but will sometimes win, because they do not violate some crucial constraints. That is to say, there is always a candidate like (28) among the candidates for a FR construction. And in this case, (28) should even turn out to be the optimal candidate.<sup>15</sup>

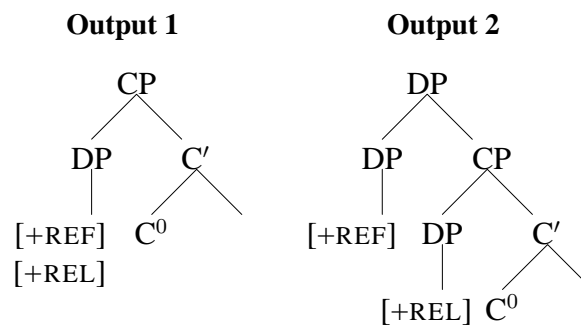
- (28) Ich vertraue einem, den ich eingeladen habe  
 I trust one-DAT who-ACC I invited have

It must be possible for GEN to generate an output like (28) from an input of the form of a FR construction. For this to be possible, I assume that GEN can perform manipulations on the functional features and categories. GEN cannot add or delete features, but it can *reorganise* them. Let us assume that the FR pronoun has two features A and B. Then in the free relative construction, these are both included in the FR pronoun, but in the case of the headed relative, they are distributed: A is in the head (i.e. “*einem*” in (28)), and B is in the relative pronoun. The semantic property that distinguishes an ordinary relative pronoun from an FR pronoun is *referentiality*: a simple restrictive relative clause cannot introduce a new discourse referent, but a free relative clause does.<sup>16</sup> So let us assume two features [ $\pm$ REF] for ‘referentiality’ and [ $\pm$ REL] for the characteristics of relative pronouns (these may be further analysable into other features, but this is a minor issue here):<sup>17</sup>

(29)

	[REF]	[REL]
pronoun	+	–
relative pronoun	–	+
FR pronoun	+	+

In the input of a FR construction, the two features are joined under one functional head. I assume that it is possible for GEN to split this feature bundle and distribute the features over several functional projections, and thereby introduce functional projections that were not present in the input.<sup>18</sup>

(30) **Input:** [+REF +REL]

The correspondence that is involved here is input-LF correspondence. We are comparing a structure that is given in the input with its output LF. The faithfulness is about the functional features and functional projections.

### 3.3 The Constraints

In (30), the output structure 2 differs in three respects from the input structure: there is one additional functional projection that was not in the input, there is an additional functional head  $D^0$ , and the features of the  $D^0$  in the specifier of the CP differ from its correspondent in the input structure, and vice versa. I want to summarise these cases as subcases of the same constraint, FAITHfunc. In addition to the mentioned input-LF faithfulness, FAITHfunc will also include instances of LF-PF correspondence, namely the occurrence of resumptive clitic pronouns in cases like (19), repeated here:

- (31)    Tha voithiso opjon            **tu**        dosis    to onoma mu  
           FUT help-1Sg whoever-ACC cl-GEN give-2Sg the name my  
   \*opjou            ‘whoever-GEN’  
   \*s’opjon        ‘to whoever’  
   \*opjou tu      ‘whoever-GEN him-GEN’  
           ‘I will help whoever you give (him) my name’

The requirement to be included in FAITHfunc is that an LF-chain of a functional category should have exactly one PF correspondent. In the case of resumptives, there are two PF elements corresponding to one LF-chain.<sup>19</sup>

- (32)    FAITHfunc: Each functional feature bundle in the input has a corresponding functional head with the same feature specification and vice versa; and a chain of a functional category has exactly one PF correspondent.

FAITHfunc is violated if

- A functional head in the input has no corresponding functional head with the same feature specification in the output LF (or vice versa)  
**or**
- More than one element of the output PF corresponds to a link of the LF-chain of the same functional category.

There are three mismatches between the input structure and the output LF 2 in (30), hence three violations of FAITHfunc:

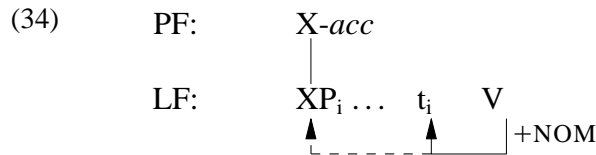
input	output 2/LF
[DP +REF, +REL]	∅
∅	[DP <sub>1</sub> +REF]
∅	[DP <sub>2</sub> +REL]

The FR structure with the additional resumptive pronoun has one FAITH-func violation, because the resumptive pronoun introduces a second PF correspondent of the same functional LF-chain.

The second constraint that I am assuming is on PF-LF correspondence and requires that the morpho-phonological case form of an element P of an output PF must correspond to the morpho-syntactic case feature of the LF-chain corresponding to P:

- (33) **MATCH:** The morpho-phonological case feature of a PF element X may not contradict the syntactic case feature of the chain of XP, the correspondent of X in the output LF.<sup>20</sup>

MATCH is violated in all instances of case attraction, as in Modern Greek and Gothic:



Take XP to be the FR pronoun. At LF, XP is the head of a chain assigned nominative by the FR-internal verb or IP (henceforth *r-case*), but at PF the morpho-phonological case affix of X, the correspondent of XP, corresponds to the accusative assigned by the matrix verb.<sup>21</sup>

The faithfulness constraints for the case features are likewise defined as correspondence rules between syntactic and morpho-phonological case features. The first constraint is violated by ordinary FR constructions:

- (35) **UNIcase:** ‘Uniqueness of case relations’. For each case required by each case assigner there is exactly one XP that stands in the appropriate structural position for case assignment and realises (morpho-phonologically) the required case feature. XPs may realise the case of at most one case assigner.

To include attraction as a mode of realising the case feature assigned by the matrix verb (henceforth ‘m-case’) in the FR pronoun in the SpecCP of the FR, it must be possible that the PF correspondent of the specifier of an AGR head can realise a case feature of that head.

- (36) A case feature is realised by XP iff
- a. One of the elements within XP’s chain is realised with the respective case morphology at PF.
  - b. The head of one of the elements within XP’s chain is an AGR-head and ‘realises’ the respective case morphology at PF via Spec-Head agreement on the PF correspondent of its specifier.

(37)

	m-case=DAT r-case=ACC	UNICase	MATCH	FAITHfunc
a. [CP <i>dat</i>		*	*	
b. [CP <i>acc</i>		*		
c. [CP <i>dat</i> ... <i>acc</i>			*	*
d. [DP <i>dat</i> [CP <i>acc</i>				***

The candidates in (37) are the candidates relevant in the competition.<sup>22</sup> (37–a) is an instance of case attraction, as exemplified by Gothic. It leaves one case unrealised, so there is one UNICase violation, and we have one MATCH violation, because of the attraction structure. Candidate (37–b) is a German-type FR clause with the *wh*-pronoun bearing r-case. There is just one UNICase violation. Candidate (37–c) has attraction and in addition a resumptive pronoun spelling out the trace, as exemplified by some Modern Greek FRs. We have one MATCH violation for attraction and one FAITHfunc violation for the clitic. Candidate (37–d) is the headed relative construction. It has three FAITHfunc violations for the change in the functional categories and their feature distribution.

We already see from this tableau that different rankings of the constraints will result in different winners. The case hierarchy will be implemented by a series of input-PF constraints, resembling MAX constraints:

- (38) REALCASE<sub>n</sub>: Each XP chain with a syntactic case feature [+CASE<sub>n</sub>] at the output LF has a morpho-phonological case feature of [+CASE<sub>n</sub>] on a corresponding element of XP at the output PF.

Again, REALCASE<sub>n</sub> can be fulfilled by the element in SpecXP if X has AGR properties, i.e., the FR pronoun can fulfill REALCASE<sub>n</sub> for m-case:

(39)

m-case=DAT r-case=ACC	REALdat	REALacc
a. [CP <i>dat</i> ]		*
b. [CP <i>acc</i> ]	*	
c. [CP <i>dat</i> ... <i>acc</i> ]		
d. [DP <i>dat</i> [CP <i>acc</i> ]		

Many possible candidates have no chance of ‘winning’ under any ranking. Some examples are given in (40):<sup>23</sup> candidate (40–d) is harmonically bounded by (40–c); candidates (40–f) and (40–g) are harmonically bounded by (40–e). Thus, (40–a,b,c,e) are the four relevant candidates.

(40)

m-case=NOM r-case=ACC	MAT	Uc	Ff	REALd	REALa	REALn
a. [CP <i>nom</i> ]	*	*			*	
b. [CP <i>acc</i> ]		*				*
c. [CP <i>nom</i> ... <i>acc</i> ]	*		*			
d. [CP <i>acc</i> ... <i>nom</i> ]	*	**	*			*
e. [DP <i>nom</i> [CP <i>acc</i> ]			***			
f. [DP <i>nom</i> [CP <i>nom</i> ... <i>acc</i> ]	*	*	****			
g. [DP <i>acc</i> [CP <i>nom</i> ]	**	****	***		*	*

Note that (40–a) can never win over (40–b), because REAL<sub>nom</sub>, which is violated by (40–b), must never be higher than REAL<sub>acc</sub>, which is violated by (40–a). Thus, a candidate of type (40–a) can only win if m-case is higher than r-case on the case hierarchy. This is exactly, what has been found in Gothic FRs.

#### 4 Analysis of German Free Relative Clauses

The constraint ranking that yields the pattern for ‘German A’ (cf. page 904) is given in (41); the constraint for the oblique cases dative and genitive is abbreviated with REAL<sub>obl</sub>:<sup>24</sup>

(41) MATCH REAL<sub>obl</sub> ≫ FAITH<sub>func</sub> ≫ UNICase REAL<sub>acc</sub> REAL<sub>nom</sub>

The top ranking of MATCH ensures that German FRs have no case attraction, and the ranking of FAITH<sub>func</sub> above UNICase ensures that German has FR

constructions under case conflict. That REALoblique is higher than FAITH-func has the effect that FRs that suppress oblique cases are ungrammatical (i.e., lose against the ‘headed’ relative construction). The following sections show this in a little more detail.

#### 4.1 Matching Free Relatives

Let us first take a look at a non-conflicting example:

- (42) *Wer das glaubt, ist ein Trumer*  
 Who-NOM this believes is a dreamer

m-case=NOM r-case=NOM	MAT REALo	Ff	Uc REALa REALn
☞ a. [CP <i>nom</i> ]			*
b. [CP <i>nom ... nom</i> ]		*!	
c. [DP <i>nom</i> [CP <i>nom</i> ]		*!***	

The same results can be repeated wherever m-case and r-case match, and if both are PPs with the same lexical preposition.

#### 4.2 Free Relatives with Case Conflict

An example that looks like matching is examples with the inanimate FR pronoun *was*, which realises both nominative and accusative. The PF form is abbreviated with ‘n/a’ in the candidate set.

- (43) *Was ich nicht wei, macht mich nicht hei*  
 what-ACC I not know makes me not hot  
 ‘What I don’t know doesn’t excite me’

m-case=NOM r-case=ACC	MAT REALo	Ff	Uc REALa REALn
☞ a. [CP <i>n/a</i> ]			*
b. [CP <i>n/a ... acc</i> ]		*!	
c. [DP <i>nom</i> [CP <i>acc</i> ]		*!***	

When the FR pronoun is animate, the PF forms of accusative and nominative differ:

- (44) *Wen ich traf, wurde eingeladen*  
 who-ACC I met was invited

	m-case=NOM r-case=ACC	MAT REALo	Ff	Uc REALa REALn
☞ a.	[CP acc			* *
b.	[CP nom	*!		* *
c.	[CP nom ... acc	*!	*	
d.	[DP nom [CP acc		*!*	

Nearly the same will happen if *r-case* is an oblique case. The only difference will be that candidate b. will have a violation of REALobl instead of REALacc. But the result will be the same, as expected. The examples with accusative as *m-case* are totally analogous, with the exception of the REALacc and REALnom violations, which are not relevant here. A possibly complicated case is the following example:

- (45) *Wessen Bücher mir gefallen, wurde eingeladen*  
 who-GEN books me-DAT please was invited

What is special here, is that the FR pronoun is not in the SpecCP of the FR, but in the Spec of a DP that itself occupies SpecCP. Presumably, it is impossible for the pronoun to undergo attraction in this case.<sup>25</sup> And even if it did, it is not the FR pronoun that would agree with the C<sup>0</sup>-AGR head of the FR, but the complex DP and thus the pronoun would be unable to fulfil REALcase<sub>n</sub> for *m-case*. The relevant example is put in brackets in (46). It is, however, clear that the expected candidate would win, no matter how the attraction candidate (46-b) were treated:<sup>26</sup>

- (46)

	[CP [DP GEN NP ] ... ]-NOM	MAT REALo	Ff	Uc REALa REALn
☞ a.	[CP gen NP			* *
(b.	[CP nom NP )	*!	(*)	* *
c.	[DP nom [CP gen NP		*!*	

The main reason for the possibility of non-matching when *m-case* is a structural case is that REALacc and REALnom are ranked below FAITHfunc. Things are different if *m-case* is oblique, because REALobl is ranked above FAITHfunc.

- (47) \*Ich helfe, wer mich fragt  
 I help who-NOM me asks

m-case=DAT r-case=NOM	MAT REALo	Ff	Uc REALa REALn
a. [CP <i>nom</i>	*!	*	*
b. [CP <i>dat</i>	*!		* *
c. [CP <i>dat ... nom</i>	*!	*	
☞ d. [DP <i>dat</i> [CP <i>nom</i>		***	

Again, the pattern can be repeated with all other combinations of oblique and structural cases.<sup>27</sup>

### 4.3 Typological Predictions

Besides the German pattern, the model predicts another 7 different possible grammars:<sup>28</sup>

- (48) a. UNICase REALobl REALacc REALnom  $\gg$  FAITHfunc  $\gg$  MATCH  
This is Modern Greek – under the assumption that in Greek the ‘resumptive’ pronouns for accusative and nominative are ‘spelled out’ by *pro* (Modern Greek is a *pro* drop language).<sup>29</sup> Here, the candidate with the resumptive pronoun wins in all instances of case conflict.
- b. FAITHfunc REALobl  $\gg$  UNICase REALacc  $\gg$  MATCH REALnom  
This is Gothic – a language in which the higher marked case is chosen, irrespective of whether it is *m-case* or *r-case*.
- c. UNICase MATCH REALobl REALacc REALnom  $\gg$  FAITHfunc  
This is a matching language like English. The ordinary headed relative construction always wins under case conflict.

The following grammars are predicted, but have not been found yet:

- (49) a. REALobl REALacc  $\gg$  FAITHfunc  $\gg$  UNICase MATCH REALnom  
In this language, nominative always loses, irrespective of whether it is *m-case* or *r-case*. In those cases where accusative and an oblique case come together, we get the FR construction with a resumptive pronoun.
- b. FAITHfunc REALobl  $\gg$  UNICase MATCH  $\gg$  REALacc REALnom  
This language has attraction if the *m-case* is oblique. In the other cases, the *r-case* is chosen on the FR pronoun.

- c. MATCH REALobl REALacc ≫ FAITHfunc ≫ REALnom UNICase  
This language only allows non-matching FRs if m-case is nominative. Grosu (1994) claims that this holds in Spanish and Romanian. There are, however, some empirical complications.<sup>30</sup>

The following grammar is predicted, but perhaps implausible, because at two instances the oblique case feature is suppressed:<sup>31</sup>

- (50) FAITHfunc MATCH ≫ UNICase REALobl REALacc REALnom

This language always lets r-case win, even if m-case is oblique.

#### 4.4 A Different German Dialect

The prediction of an implausible language might already be a good reason to look for further refinements of the model. Note also that thus far our model does not predict the German variant B discussed on page 904. This variant does not allow a free relative if m-case is accusative and r-case is nominative.<sup>32</sup>

However, this variant can be predicted with a different implementation of the case hierarchy. This implementation allows hierarchically higher cases to satisfy realisation requirements for hierarchically lower cases:

- (51) REALnom can be fulfilled by any morphological case feature  
REALacc can be fulfilled by any morphological case feature, except nominative  
REALobl can only be fulfilled by the proper oblique case feature (i.e., dative for dative, genitive for genitive, etc.)

With this we get both variants of German:

- (52) German A:  
✓*Er zerstört wer ihm begegnet*  
he destroys who-NOM him-DAT meets

m-case=ACC r-case=NOM	MAT REALo	Ff	Uc REALa REALn
☞ a. [CP nom]			* *
b. [CP acc]	*!		*
c. [CP acc ... nom]	*!	*	
d. [DP acc [CP nom]		*!*	

The crucial reranking from German A to German B is that REALacc goes above FAITHfunc and UNICase:

- (53) German B:  
 \*Er zerstört wer ihm begegnet  
 he destroys who-NOM him-DAT meets

m-case=ACC r-case=NOM	MAT	REALo	REALa	REALn	Ff	Uc
a. [CP nom			*!			*
b. [CP acc	*!					*
c. [CP acc ... nom	*!				*	
d. [DP acc [CP nom					***	

#### 4.5 Revised Typology

With the modification in (51) and two additional ones, we can further restrict the pattern. REALnom plays no role in the interaction of the constraints, so we can eliminate it – it is always fulfilled in the competitions under debate here. REALobl can be argued to be inviolable, and hence part of GEN<sup>33</sup> – thus, candidates that violate REALdat or REALgen will never be generated. So REALobl can also be removed. We then no longer need to postulate fixed a ranking of constraints, because REALacc is the only constraint of the case hierarchy that is left. The four constraints we now use are: REALacc (in the new version where REALacc can be fulfilled by any case form except nominative), UNICase, FAITHfunc and MATCH. This rules out the possibility of (50). We now get the prediction of six grammars, each of which is quite reasonable:

- (54) a. UNICase REALacc  $\gg$  FAITHfunc  $\gg$  MATCH  
 This is instantiated by Modern Greek (48-a).  
 b. FAITHfunc REALacc  $\gg$  UNICase MATCH  
 This is instantiated by Gothic (48-b).  
 c. UNICase MATCH REALacc  $\gg$  FAITHfunc  
 A language without FRs under case conflict (48-c).  
 d. FAITHfunc  $\gg$  UNICase MATCH  $\gg$  REALacc  
 Not found yet, but very close to Gothic, cf. (49-b).  
 e. MATCH  $\gg$  FAITHfunc  $\gg$  REALacc  $\gg$  UNICase  
 German, variant A.

- f. MATCH REALacc  $\gg$  FAITHfunc  $\gg$  UNIcase  
 German, variant B.

It is easy to see now how the two variants of German differ, namely, in the relative ranking of FAITHfunc and REALacc. For German A, it is better to leave accusative unrealised (and violate REALacc) than to rearrange the functional material of the FR (and violate FAITHfunc). The opposite holds for German B.<sup>34</sup>

## 5 Concluding Remarks

The main advantage of the proposed analysis is its ability to predict typological variation in a much better way than previous accounts – and it does so by making use of an even simpler and comparatively unproblematic syntactic analysis. The number of construction specific assumptions has been reduced, but the typological predictions of the present account look much more realistic. The system of constraints is able to filter out a set of candidates that includes only the types of FR constructions that we find universally. The constraints used are all defined as constraints on correspondences between different levels of representation, input–LF and PF–LF. The constraints conflict: a candidate that performs well on input–LF correspondence performs worse on PF–LF correspondence. Languages seem to differ in which correspondence they consider to be more important. The constraints are formulated in a general, non-construction-specific way. The system thus should be able to account for phenomena other than FR constructions. This opens further fields of research.

## Notes

I would like to thank the following colleagues for helpful comments and fruitful discussions: Artemis Alexiadou, Gisbert Fanselow, Hans-Martin Gärtner, Anastasia Giannakidou, Jane Grimshaw, Alex Grosu, Fabian Heck, Geraldine Legendre, Gereon Müller, Peter Öhl, Doug Saddy, Tanja Schmid, Sten Vikner. I'm further thankful to the audiences of presentations of parts of this paper at the University of Stuttgart on April 15, 1999, the GGS 1999 workshop in Stuttgart, May 15, 1999, at the University of Potsdam on July 16, 1999, at Rutgers University, New Brunswick, on September 10, 1999, and at Johns Hopkins University, Baltimore, on October 7, 1999. All remaining errors are mine. The work on this paper was fully supported by a grant

for the DFG research project “Optimalitätstheoretische Syntax des Deutschen” (MU 1444/2-1), University of Stuttgart.

- 1 The article by Groos & van Riemsdijk has been very influential and is still the source of the most-widely accepted syntactic analysis of FR constructions. But the paper unfortunately bears some misleading judgements of German FR constructions which have been taken over by many researchers. Van Riemsdijk still claims that German is a matching language, as can be seen in van Riemsdijk (1998). Although there might be some German speakers whose judgements are as described by Groos & van Riemsdijk, it seems that the majority of Germans judge differently.
- 2 For many speakers, examples with sentence-initial FRs are less acceptable than the examples in (54). I view this as an effect of parsing difficulties. Because German is a non-matching language, the hearer has several options for the grammatical function of a FR, in general. If the FR is clause-final, it is easy to detect its grammatical function (GF), because usually there is only one GF left that is assigned by the verb and not yet realised by some constituent. For a clause-initial FR, however, everything is open, and its GF can only be guessed at the point of its occurrence. So we expect that clauses with clause-initial FRs are parsed with a higher error rate than those with clause-final FRs. The same problem occurs with sentence-initial FRs assigned accusative by the matrix verb.
- 3 The brackets around the asterisk indicates the disagreement about the data between German native speakers.
- 4 This explanation has already been given by Groos & van Riemsdijk 1981.
- 5 The question arises as to whether such effects of homophony can also be found with lexical items other than pronouns. A case in point could be the following:

- (i) a. (?)Ich lade ein, wessen Eltern ich vertraue  
 I invite who-GEN parents-DAT I trust  
 \*Ich lade ein, wessen Geschwistern ich vertraue  
 I invite who-GEN siblings-DAT I trust

The surface form of *Eltern* is the same in all four morphological cases of German, while it is *Geschwistern* only in the dative, and *Geschwister* in nominative, accusative and genitive. This is crucial for the judgements in (i). While German native speakers may disagree on the grammaticality status of (i-a), they agree that (i-b) is significantly worse than (i-a). Whatever explanation might be found for this fact, it is obvious that the differing morphological paradigms for *Eltern* and *Geschwister* play a role.

- 6 I cannot make a statement about where these two variants originate. As far as I can see, it has nothing to do with different regions. I also cannot affirm that it is a matter of different generations or social class.
- 7 For a broad range of arguments that German dative is not a structural case, contrary to what has often been claimed, see Vogel & Steinbach (1998).

- 8 The FR pronoun always realises the FR internal case in the following examples.
- 9 I abbreviate the features as ‘*wh*’ and ‘REL’, without discussing the actual nature of these features. These labels should be seen as informal cover terms.
- 10 A quite extensive discussion of the different distributions of free relatives and embedded *wh*-clauses in English can be found in the first sections of Bresnan & Grimshaw 1978.
- 11 FRs in preverbal position should be analysed as instances of left dislocation, as Alexiadou & Varlokosta (1995) convincingly demonstrate.
- 12 The main empirical reason for the assumption of a DP–CP structure is the matching effect. We will see that it can also be derived in a ‘bare CP’ analysis.
- 13 The somewhat misleading term ‘head’ is used very often to refer to the ‘antecedent’ of restrictive relative clauses. I will avoid it as much as I can.
- 14 Translation: “In a case conflict between the case K1 required by the matrix verb and the case K2 required by the verb in the free relative clause, K1 can remain unrealised if K1 precedes K2 in the following case hierarchy:  
(CH) nominative < accusative < dative/prepositional case”
- 15 This strategy of accounting for ungrammaticality is quite frequent in optimality theory. It is called *neutralisation*. The winner of one competition is also the winner of another competition – in this case it would be one with the headed relative clause as input. And in this competition, (55) has an even better profile, because it presumably violates fewer constraints than with an FR construction in the input. For other applications of neutralisation in OT syntax, cf. Legendre et al. (1995, 1998) and Keer & Baković (forthcoming).
- 16 Wiltschko (1999) presents many pieces of evidence that FR pronouns are semantically indefinites.
- 17 Independent empirical motivation for this feature composition analysis can be seen in the design of the FR pronoun in Modern Greek; cf. section 2.1.
- 18 Note that this requires a theory that clarifies which features can be ‘projecting’ and which cannot. But this is not an extra complication. In the domain of verbs, e.g., there is an ongoing debate in generative syntax about which morpho-syntactic features of verbs are heads of their own projection, and which are not. INFL has been split into TENSE and AGR and the latter has become controversial; under debate are also ASPECT, NEGATION, VOICE a. o. I mention this to show that the proposed mechanism does not bring in extra complications compared to traditional approaches, at least in this respect.
- 19 This is reminiscent of the constraint ‘SILENT TRACE’ of Pesetsky (1998). FAITHfunc can be seen as composed of simpler constraints. It is, however, a *disjunction*, not a conjunction, we are dealing with here, because a single violation of one of the combined constraints suffices to get a violation of FAITHfunc. In order to distinguish matching languages from languages without FRs, we would have to split FAITHfunc. I avoid this here only for ease of presentation. See Vogel (in prep.)

- 20 It has become standard in minimalist syntax to assume that case features of DPs are no longer present at LF. However, what still is present is the trace in the case *position*, which means that we can always reconstruct a DP's case feature from its chain. This will suffice for the present purpose.
- 21 I do not want MATCH to be a constraint on PF-input correspondence, because in this case MATCH would also be violated by output 2 in (30). Both DP<sub>1</sub> and DP<sub>2</sub> have the same DP as the input. This DP is assigned *r-case*. But DP<sub>1</sub> realises *m-case*. Thus, DP<sub>1</sub> is unfaithful w.r.t. its case feature. On the other hand if we look at the LF, then DP<sub>1</sub> and DP<sub>2</sub> build chains of their own and each corresponds its own PF element. There is a one-to-one mapping between the case features. MATCH is obeyed. A violation of MATCH would have the effect that in (30) output 2 would be 'harmonically bounded' by output 1: both would have one violation of MATCH, but in addition output 1 would have one violation of FAITHfunc, while output 2 would have three. In the account being developed here, the two candidates behave alike w.r.t. all other constraints, so output 2 would always lose against output 1.
- 22 I abbreviate the structures by only indicating the syntactic category of the candidates and the overt case features that occur in them. Abstract case features are printed in capitals, overt (PF-) case features in italics.
- 23 A short glossary for the abbreviation of the constraints in the following tableaux: MAT = MATCH; Ff = FAITHfunc; Uc = UNIcease; REALo = REALobl; REALd = REALdat; REALa = REALacc; REALn = REALnom. These abbreviations are only introduced to keep the width of the tables small enough.
- 24 That there is no '»' between constraints (as, e.g., between MATCH and REALobl) only means that we have no evidence from the given data for the ranking of two constraints with respect to each other.
- 25 I know of no example of this kind from attraction languages. But even in German this construction poses additional complications, which I do not have an answer to yet. See footnote 5 for one example.
- 26 It is impossible to construe an example with a resumptive pronoun, because the chain of the FR pronoun has only one link.
- 27 The situation with matrix PPs will only be mentioned briefly. GEN may not erase lexical items from the input, so only those variants are possible outputs, where the preposition is preserved, which eliminates the candidate where the *wh*-pronoun realises *r-case*, and not the PP:

- (i) Ich schreibe \*wer / über einen, der mir gefällt  
 I write who-NOM / about one, who-NOM me-DAT pleases

m-case=PP r-case=NOM	MAT REALo	Ff	Uc REALa REALn
a. [CP P	*!		* *
b. [CP P ... nom	*!	*	
c. [PP P [CP nom		***	

- 28 The typological predictions of the proposed model have been calculated with the help of the constraint ranking software *OTSOF*T, developed by Bruce Hayes (Hayes 1998). Only FRs with case conflicts are taken into account here, so this typology does not differentiate between languages with only matching FRs and those without any FRs. The fully developed typology is presented in Vogel (in prep.).
- 29 See Alexiadou & Varlokosta (1995) for a discussion of Modern Greek FRs.
- 30 These complications have to do with the fact that in Spanish and Romanian animate direct objects are realised with an obligatory preposition, while inanimates are not. As a consequence of this, animate direct objects require matching, while inanimates do not. The latter behave like nominatives (they are morphologically indistinguishable from nominatives anyway). There are several possibilities to account for this in the present system. The above ranking is only one option, and it requires additional assumptions about inanimate direct objects. See Grosu (1994) for a detailed discussion of the data. I will present my account of this problem in Vogel (in prep.).
- 31 One could also state that this is the ranking for German A. The ‘implausible’ candidates occur in those cases where German A has no FRs. We might then assume that an FR that suppresses dative or genitive wins the competition, but is ungrammatical for independent reasons, e.g., uninterpretability because of the deletion of semantically necessary oblique case features.
- 32 The problem is that in order to rule out a configuration with m-case=ACC and r-case=NOM, we have to rank REALacc above FAITHfunc, but we then wrongly rule out FRs with the configuration [m-case=ACC r-case=DAT].
- 33 One could, for example, argue that these case forms are like lexical items. That dative case in German can have its own specific semantic contribution in a clause, has been shown by Wunderlich (1996), among others.
- 34 The version of German that was proposed by Groos & van Riemsdijk (1981) would be a matching language like (54-c).

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