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The matching effect in resumption: A local analysis based on Case attraction and top-down derivation

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Abstract In this paper we analyze a hitherto unstudied matching effect in resumptive relatives. In some languages where gaps and resumptives are in complementary distribution, the choice between the two strategies depends on the Case of the head noun: in Swiss German, the focus of our study, dative relativization requires resumptives; however, the resumptive is omitted if the head noun bears dative as well. This non-local dependency poses a serious challenge to local derivational bottom-up theories of syntax. We argue that a local solution is possible if the distribution of gaps and resumptives is reinterpreted in terms of Case attraction and the derivation unfolds top-down. Consequently, the relevant piece of information, the Case of the head noun, is available on the operator so that the choice between gaps and resumptives can be made without recourse to non-local devices. Gap relatives obtain in configurations where the Case attraction derivation converges while resumptives occur as a repair in derivations where Case attraction leaves a Case-probe unchecked. The matching effect falls out naturally as a subcase of Case attraction.

Keywords Relative clauses · Resumption · Case attraction · Locality · Top-down derivation · Matching · Hierarchy effects · Swiss German

1 Introduction

Languages that make grammatical use of resumptive pronouns in A′-dependencies can be divided into two groups with respect to the distribution of gaps and resump-

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tives: in the first group, gaps and resumptives can occur in identical environments, e.g. in the relativization of (matrix) direct objects in Irish, see McCloskey (1990:205) and Salzmann (2013) for a list of languages. This optionality has generally been captured by positing different numerations for the two strategies (usually capitalizing on the properties of the complementizer), see Shlonsky (1992:452f.), Suñer (1998:346ff.), McCloskey (2002:205), and Sichel (2014).

In this paper we focus on the second group of languages, where gaps and resumptives are in complementary distribution. Languages of this type are, among others, Welsh (Willis 2000), Breton (Guilliot 2006), and Swiss German (Weber 1987; Riemsdijk 1989, 2008). Our argument will be based on data from Swiss German, where relative clauses are introduced by an invariant complementizer *wo* (*won* before vowel-initial clitics); the operator is silent.[1] The local relativization of subjects and direct objects requires gaps while datives (indirect objects) and relations lower on the accessibility hierarchy (Keenan and Comrie 1977) require resumptives, see (1) (the Case-subscripts indicate the Case assigned to the head noun/to the operator). The resumptives are usually identical to clitic/weak personal pronouns and unless governed by prepositions are fronted to the Wackernagel position:[2,3]

(1) a. Ich suech$_{acc}$ de Bueb, wo **(*er)** immer z spaat chunt$_{nom}$.
I search.1S the.ACC boy C (he) always too late come.3S
'I'm looking for the boy who is always late.' SU

b. Ich hilf$_{dat}$ em Bueb, won i **(*en)** geschter gsee$_{acc}$ han.
I help.1S the.DAT boy C I (him) yesterday seen have.1S
'I help the boy who I saw yesterday.' DO

c. Ich suech$_{acc}$ de Bueb, wo mer ***(em)** es Buech ggëë$_{dat}$ händ.
I search.1S the.ACC boy C we (he.DAT) a book given have.1P
'I'm looking for the boy who we gave a book to.' IO

The distribution is usually accounted for as follows: resumptives for datives are either motivated by locality (they are PPs introduced by a silent preposition and thus islands) or by recoverability (oblique Cases being subject to special conditions on realization). Since none of this holds for subjects and direct objects, resumptives are taken to be unnecessary (for a recent overview of theories of resumption, see Rouveret 2011).

However, resumptives for subjects and direct objects are not ruled out throughout: as in many other languages, they are obligatory once the variable is located inside an island. The following examples illustrate resumption in CNPC and adjunct islands (islands will henceforth be indicated by means of angled brackets):[4]

[1] Examples without references were constructed by the second author, who is a native speaker of Zurich German.

[2] Dative is the only oblique Case in this variety of German, genitive has been lost. Other oblique relations involve prepositions which given that Swiss German prohibits preposition stranding require resumption as well.

[3] The following abbreviations are used in the glosses: 1/2/3 = person, ACC = accusative, AOR = aorist, C = complementizer, DAT = dative, F = feminine, FUT = future, GEN = genitive, IMP = imperative, M = masculine, NOM = nominative, P = plural, PRS = present, PFV = perfective, S = singular.

[4] In Swiss German, resumption in islands is fully grammatical (unlike intrusive resumption in English, cf. Chao and Sells 1983). The distribution of SU/DO-resumptives in Swiss German is not gradient but

(2) a. Das isch$_{nom}$ de Politiker, wo d ⟨ Behäuptig, dass ***(er)** d Susi
this be.3S the politician C the claim that he the Susi
küsst hät$_{nom}$ ⟩, nöd stimmt.
kissed have.3S not be.correct.3S
lit.: 'This is the politician that the claim that he kissed Susi is wrong.'

b. Das isch$_{nom}$ de Politiker, wo d ⟨ Behäuptig, dass ***(en)** d Susi
this be.3S the politician C the claim that him the Susi
küsst$_{acc}$ hät ⟩, nöd stimmt.
kissed have.3S not be.correct.3S
lit.: 'This is the politician that the claim that Susi kissed him is wrong.'

(3) a. Das isch$_{nom}$ de Politiker, won i uusgwandered bin, ⟨ wil
This be.3S the politician C I emigrated be.1S because
***(er)** d Susi küsst hät$_{nom}$ ⟩.
he the Susi kissed have.3S
lit.: 'This is the politician that I emigrated because he kissed Susi.'

b. Das isch$_{nom}$ de Politiker, won i uusgwandered bin, ⟨ wil
This be.3S the politician C I emigrated be.1S because
***(en)** d Susi küsst$_{acc}$ hät ⟩.
him the Susi kissed have.3P
lit.: 'This is the politician that I emigrated because Susi kissed him.'

The unavailability of the gap-strategy in islands can obviously be related to locality as movement out of islands is prohibited. However, given that resumptive derivations are in principle possible, the question arises how they can be blocked in the local relativization of subjects and direct objects. The problem is particularly pressing from the perspective of a local-derivational phase-based model, where the structure is built-up bottom-up and the accessible structure is restricted by the Phase Impenetrability Condition (PIC, Chomsky 2000, 2001): in the present case, the choice between gap and resumptive would have to be made at an early point of the derivation, i.e., when the verb merges with the subject/direct object. However, the necessary piece of information for the correct choice, viz. the presence/absence of islands higher up in the structure, is not yet available. Most approaches which have addressed the complementarity do not provide a local solution but resort to transderivational/translocal comparison: resumption is considered less economical than the gap-strategy, either because of Fewest Steps, see Aoun et al. (2001), Rouveret (2002:153f.), or because of the Avoid Pronoun Principle (Chomsky 1981), see Riemsdijk (1989), Pesetsky

categorical: they are ruled out in local relativization but required in all other contexts. This includes regular long-distance relativization across a finite clause-boundary, which functions as a barrier for relativization (while non-finite complementation requires gaps):

(i) Ich hilf$_{dat}$ em Bueb, won i gsäit han, dass ***(en)** d Susi geschter gsee$_{acc}$ hät.
I help.1S the.DAT boy C I said have.1s that him the Susi yesterday seen have.3S
'I help the boy who I said Susi saw yesterday.' embedded DO

See Salzmann (2006) and Riemsdijk (1989, 2008) for more examples and discussion.

(1989). There are two proposals which are not confronted with this problem, viz., Willis (2000) and Müller (2014): in these approaches resumptive derivations crash outside of islands. Resumptives are required for datives in local relativization because they are reanalyzed as PPs and hence islands. There is thus just one converging derivation per context so that the complementarity follows directly.

However, there is an additional, little known complexity in the distribution of gaps and resumptives: in some languages, resumption (in non-island contexts) is affected by matching, i.e. the resumptive is omitted if the head noun bears the same Case, compare (4-a) with (1-c); (4-b), from Hodler (1969:247), provides another example from a descriptive grammar (see also Dalcher 1963:127):

(4) a. Ich hilf$_{dat}$ em Bueb, wo mer **(*em)** es Buech ggëë$_{dat}$ händ.
I help.1S the.DAT boy C we he.DAT a book given have.1P
'I help the boy who we gave a book to.'

b. Lüte, won es **(*ene)** guet geit$_{dat}$, darf me nid ergrübled
people.DAT C it they.DAT good go.3S may.3S one not disturbing
Sachen uftische$_{dat}$.
things confront.with.3S
'One shouldn't confront people who are doing well with negative things.'

Even though the matching effect was already mentioned in traditional descriptions of Swiss dialects and has also been described for Hebrew (Cole 1976:581) and Croatian (Gračanin-Yuksek 2013),[5] its theoretical implications have not been addressed so far: matching in resumption is another challenge for local-derivational approaches because the choice between gap/resumptive depends on the Case of the head noun, a piece of information that is not available inside the relative clause (RC), where the choice would have to be made. Note that this problem arises in every theory of resumption (i.e. spell-out, e.g., Pesetsky 1998, base-generation, e.g., McCloskey 1990, and Big-DP approaches, e.g., Boeckx 2003) if the choice is to be made locally.

It is very difficult to model the influence of the Case of the head noun: under a spell-out approach, one has to postulate complex chains and formulate explicit conditions that regulate their realization (e.g., spell out datives at the bottom of the chain as resumptives unless the complex chain contains another dative Case). Such solutions are highly non-local and essentially reformulate the empirical observation. Similar problems arise in approaches where one can freely choose between gap/resumptive at the beginning of the derivation: once the head noun is encountered, one has to check whether the correct choice was made inside the RC. This not only requires complex chains and stipulated conditions of the above type but also backtracking. Alternatively, if both gap and resumptive derivations are generated, the choice must be rel-

[5] In Croatian, the matching effect with resumptives only occurs with direct objects but not with oblique relations. We have no account for this difference. Furthermore, according to Gračanin-Yuksek (2013:29, 39), there is a certain optionality in matching contexts. Hebrew and Swiss German also allow for deletion of preposition+resumptive if the head noun is governed by the same preposition. In what follows, we will abstract from this, not the least because PP-matching—as in free relatives—is subject to much stricter conditions; usually, matching is only felicitous if the predicates are identical.

egated to transderivational comparison. Ideally, only one derivation should converge per context. The two approaches which pursue this strategy, viz., Willis (2000) and Müller (2014), cannot account for the matching effect because this effect shows that *dative resumptives are unrelated to islandhood:* the island-status of datives should be independent of properties of the head noun. Other ways of enforcing the complementarity under bottom-up strike us as highly undesirable: under head-raising, where the head noun is merged with the operator, one could stipulate that dative operators are realized as zero in their θ-position if their complement bears dative as well. However, the reverse condition would be just as plausible, showing that such analyses fail to provide a linguistic rationale for the matching effect.

It is against this background that we would like to propose a new analysis which not only (a) provides a *local* solution to the challenges posed by the distribution of gaps and resumptives, but also (b) provides a syntactically plausible rationale for the matching effect: the matrix Case is recoverable from the relative operator and thus locally available inside the RC. This result can be achieved if (i) the distribution of gaps and resumptives is re-interpreted in terms of Case-attraction and (ii) the derivation unfolds top-down instead of bottom-up. Our approach will not involve any global computations; resumption is a local repair and there is just one converging derivation per context.

The paper is organized as follows: in Sect. 2 we describe the similarities between Case attraction and the distribution of gaps and resumptives. In Sect. 3, we present a top-down analysis of the phenomena under which the matching effect falls out directly. Section 4 shows the advantages of top-down over bottom-up derivation and discusses general implications for resumption. Section 5 concludes.

2 Case attraction

2.1 Similarities between Case attraction and the distribution of gaps and resumptives

At first sight, it may be surprising to relate the distribution of resumptives to Case attraction. But as we will now show, the constructions share two important properties. To see this, let us first have a look at Case attraction: in this construction, the relative pronoun (RelP) does not bear the Case governed by the relative clause internal Case-probe, but rather the Case assigned to the head noun of the RC. In the following examples the relative pronoun bears genitive, the Case of the head noun, although it should have been assigned accusative/nominative inside the RC:

(5) a. mne:moneúete$_{gen}$ toû lógou hoû
remember.2P.PRS.IMP the.GEN.S.M word.GEN.S.M which.GEN.S.M
egò: eîpon$_{acc}$ humîn
I.NOM.S say.1S.AOR you.DAT.P
'Remember that word which I said to you.'
New Testament Greek (Kirk 2012:202)

b. daz er [...] alles des verplac$_{gen}$ des im ze
that he all that.GEN abandoned.3S which.GEN he.DAT to
schaden mohte$_{nom}$ komen
damage might.3S come
'that he abandoned all that might cause damage to him'
Middle High German (Pittner 1995:198)

Apart from the attraction process itself, there are two further properties of the construction that any analysis has to take into account: (i) Case attraction is generally optional; (ii) attraction is only possible if the matrix Case is more oblique than (or, in our analysis below, as oblique as) the Case assigned in the RC, with obliqueness being measured according to the hierarchy in (6), see Grosu (1994:122) and Pittner (1995:200f.):[6]

(6) Gen ≻ Dat ≻ Acc ≻ Nom

The first similarity is that in both Case attraction and Swiss German relatives the form of an element inside the relative clause depends on the Case of the head noun: in attraction, the head noun determines the Case of the relative pronoun while in Swiss German relativization it influences the choice between gaps and resumptives, as shown by the matching effect. The other similarity becomes obvious once the following table is inspected (MC refers to matrix Case, RC refers to relative clause-internal Case; islands will be discussed in Sect. 4.2):

(7) Distribution of resumptives in Swiss German local relativization

MC-Case	RC-Case	result
Dat	Nom/Acc	gap
Dat Nom/Acc	Dat Nom/Acc	gap
Nom/Acc	Dat	resumptive

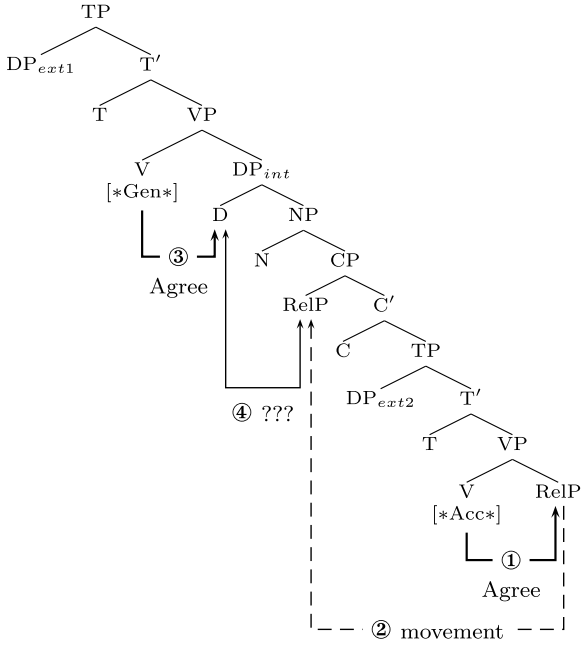
The distribution of gaps/resumptives is also subject to a hierarchy effect: gaps are only possible if the matrix Case is more oblique than or as oblique as the RC-Case (given the obliqueness hierarchy Dat ≻ unmarked, see 3.2.2 below). Thus, they have exactly the same distribution as Case attraction. Furthermore, resumptives occur when the MC-Case is less oblique than the RC-Case, viz., when Case attraction is blocked.

[6]For reasons of space, we will restrict ourselves to headed relative clauses. Attraction and matching are also found in free relative clauses, but seem to show somewhat different properties. We abstract away from more fine-grained cross-linguistic differences and various preferences that have been reported in the literature, e.g., that attraction in Ancient Greek is most frequent with accusatives. An interesting exception to the hierarchy generalization is Nez Perce, where nominative, accusative and ergative can be attracted to each other (Amy Rose Deal, p.c.).

2.2 Challenges for a derivation of Case attraction

Like the matching effect in resumption, Case attraction poses a challenge for a local-derivational bottom-up approach because the Case of the head noun is not available at the point where the Case of the RelP is normally determined inside the RC. A bottom-up derivation of examples such as (5-a) might look as in (8). Given standard assumptions, the relative pronoun should be assigned accusative by the verb inside the relative clause ①. The relative pronoun would subsequently move to the left periphery ②, and the external D would be assigned Case by the matrix Case-probe ③. However, since the relative pronoun surfaces with the MC-Case genitive, the external D and the relative pronoun must communicate somehow (via the head noun N) ④:[7]

(8) Case attraction bottom-up: MC=Gen; RC=Acc; RelP=Gen



This interaction between D/N and RelP seems to require one of the following strategies: (a) Case assignment in the RC can be suppressed so that the operator remains active for Agree with the head noun. (b) The relative pronoun is assigned the matrix Case in addition to the RC-internal Case (Case stacking), see Vogel (2001). To model Case attraction in headed relative clauses one can assume that the second

[7] For ease of representation all tree diagrams used in this paper will be strictly right-branching, even in OV languages. For reasons of space, the projection of the functional head v is omitted in most tree diagrams; as discussed in fn. 19 below, V is the assigner of accusative and dative Case.

Case that is assigned is realized (while in the absence of attraction the first one is realized).[8] (c) The Case value of the relative pronoun is overwritten, either in syntax, cf. Deal (to appear), or at PF, see Harbert (1983:270, 272), Bianchi (2000:68f.), Spyropoulos (2011). (d) Case values are generally assigned at PF: in Alexiadou and Varlokosta (2007), RelP receives matrix Case because at PF it is in the left periphery and hence closer to the matrix probe than to the RC-internal probe. In Assmann (2014), the external D and RelP are assigned Case independently in syntax; at PF, there is an additional Agree operation that checks whether their Case values are compatible.

It is clear that the phenomenon inevitably requires a relaxation of certain standard assumptions about Case assignment. Solutions (b)–(c) are in conflict with a strict version of the Activity Condition according to which a DP is only visible for Case-assignment if it has not been involved in an Agree operation valuing its Case feature (Chomsky 2000). Solutions (a) and (d) do not have to relax the Activity Condition; however, they need to assume that Case-Agree with the RC-internal probe must be prevented. Crucially, suppression (solution a) requires look-ahead in that it must be limited to attraction configurations (governed by the hierarchy in (6)) which, however, cannot be detected within the relative clause. Furthermore, it violates the Earliness Principle (Pesetsky 1989), which demands that an operation apply as soon as its context is met. In Alexiadou and Varlokosta's approach (solution d) it remains completely unclear what happens to the RC-internal Case-probe. Furthermore, in some languages, RC-internal secondary predicates related to the RelP bear the RC-internal Case. This is completely unexpected if the RelP is not assigned Case inside the RC at all.[9] Given that there is independent evidence that a strict version of the Activity Condition is not tenable, cf. Nevins (2004), we believe that a relaxation of the Activity Condition is the more straightforward strategy to cope with Case attraction. However, even those approaches that relax the Activity Condition are confronted with problems: all except Assmann (2014) fail to account for the hierarchy effect in (6). As for overwriting, it may create problems for recoverability (at least when dative is overwritten by genitive, a rare fact, but e.g. attested in New Testament Greek, see Harbert 1983:277, fn. 7). Furthermore, PF-approaches predict that attraction should be bled by syntactic movement operations that remove the RelP from the Case-assignment domain of the head noun, contrary to fact: as shown in (5-b), extraposition of the RC does not affect attraction. Given a PF-approach, one either has to stipulate that the PF-Agree operation applies to the pre-movement configuration (Assmann 2013) or that extraposition applies after PF-Agree. While our proposal below also involves a relaxation of the Activity Condition, it avoids the pitfalls of previous approaches.

[8] As shown in Plank (1995), Merchant (2006), and Assmann et al. (2014), languages use different strategies in the morphological realization of abstract Case stacking. The realization of the last Case is just one option.

[9] We thank an anonymous reviewer for pointing this out; for more discussion of secondary predicates, see Sect. 3.2.3 below.

3 A top-down analysis

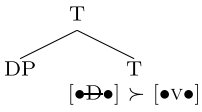
We will now provide a local analysis of the complementarity between gaps and resumptives. It is based on two ingredients, viz., Case attraction and top-down derivation. Case attraction makes the Case of the head noun available on the operator. Given top-down derivation, the operator moves to its θ-position, where the choice between gaps and resumptives can be made based on the Case information that the operator bears.

3.1 Assumptions for top-down derivation

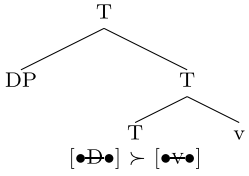
Adopting insights from previous work on top-down derivation (Richards 1999, 2002; Phillips 2003; Guilliot 2006; Bianchi and Chesi 2014), we make the following assumptions: (i) The structure is built up incrementally from top to bottom. (ii) Constituents are base-generated in their surface position. (iii) Constituents are moved downwards, in the case of arguments to discharge structure building-features associated with θ-roles; movement involves creation of copies. Additionally, (iv) the usual locality restrictions hold (leading to successive-cyclic movement via the edges of the phases vP and CP, see Sects. 4.1 and 4.2 for details). Finally, (v) the Case filter (Chomsky 1981) requires that the Case feature(s) of every DP be checked.

Importantly, while top-down derivation can be implemented in various ways (see the references above), we will adopt a version that basically only differs from the standard bottom-up model in the direction of the derivation. This means that syntactic operations (Agree, external and internal Merge) are feature-driven as usual; the structure unfolds incrementally by successive discharge of these features. To give a brief illustration of structure-building: in a declarative clause where T selects a specifier (subject DP) and a vP as its sister, T will bear two ordered structure-building features (rendered as bullets; for the notation, see Heck and Müller 2007): {[•D•] ≻ [•V•]}. In the first step, T merges with DP and discharges [•D•], see (9-a). Subsequently, T projects downwards and merges with v, discharging [•V•], see (9-b) (cf. Schneider 1999 for the assumption that the head of the complement is introduced before the specifier of the complement):

(9) a.



b.



As one can see, the structural relationships change during the derivation given cyclic structure-building (DP is the sister of T in (9-a) but becomes the specifier in (9-b); for arguments in favor of this, see Phillips 2003).

More important for the analysis are the following assumptions about Agree in Case-features (henceforth *Case-Agree*): (i) Agree involves checking, i.e. DPs start out with pre-specified Case values [uCase]. This is necessary to explain how an XP in the left periphery can bear Case (e.g., when it undergoes A′-movement): if the Case value were not determined until the XP reaches its Case-position, one would have to resort to non-local chains to ensure the correct Case on the top copy. (ii) The pre-specified Case feature of a DP [uCase] needs to be checked by a c-commanding probe bearing a corresponding [∗Case∗]-feature (probes are rendered as star-features, for the notation, see e.g. Sternefeld 2006).[10] Agree is defined as follows:

(10) *Definition of Agree (based on Chomsky 2000, 2001)*:
Agree between a probe P and a goal G applies if
   a. P c-commands G,
   b. P has an undischarged feature [∗F∗] and G has a corresponding pre-specified feature [uF],
   c. G is the closest goal for P.
   d. Result: [∗F∗] on P is discharged; [uF] on G is checked.

(iii) Probe features must be discharged as well. Crucially, there are two ways of achieving this, viz., checking and matching:

(11) *checking*:
Checking involves Agree between a DP with an *unchecked* Case feature [uCase] and a probe [∗Case∗]. It requires identity of features, i.e. it is only possible if the goal has the same features as the probe.

(12) *matching*:[11]
Matching involves Agree between a DP with a *checked* Case feature [uCase] (viz., DP has already been involved in Case-checking) and a probe [∗Case∗]. It does not require identity of features, viz. it is possible if the probe has a *subset* of the features of the goal (see below on Case decomposition for the relevance of the subset condition).

The possibility of matching allows a goal to satisfy more than one Case-probe; in the present context, RelP can thus enter Agree with both the Case-probe in the matrix clause (which leads to attraction) and the RC-internal Case-probe.

(iv) As for concord within DP, we assume that all heads above N have a [∗Case∗]-probe in addition to their inherent Case feature [uCase]; the two Case-features need to have the same values:[12]

[10] We would like to emphasize that, as in checking approaches in general, the pre-specified Case value can be chosen freely. If there is no corresponding probe feature, the derivation simply crashes.

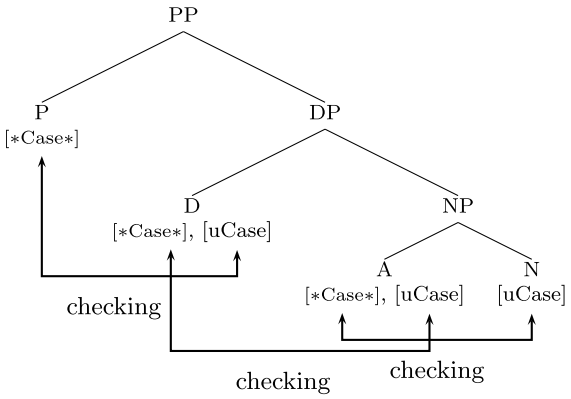
[11] For independent motivation for the concept of matching, see Anagnostopoulou (2005) and Richards (2008) on PCC-effects.

[12] The same holds for phi-features, which we omit here. This doubling of features is not a peculiarity of top-down derivation but a general property of checking approaches to concord within DP, see Georgi and Salzmann (2011:2083, fn. 25).

(13) $D_{[uCase],[*Case*]}$

This doubling of features is necessary to account for the fact that DP-internal heads above N can agree both with a higher and with a lower head. Within a DP (here selected by P), the following operations thus take place (we use a simplified DP-structure just consisting of D, A and N):

(14)



(v) To ensure communication between the matrix clause and the relative clause, we assume an additional Agree operation between the head noun and the relative pronoun/operator (see also Spyropoulos 2011). Such an Agree relationship may be needed anyway to account for agreement in number and gender as in the following example where the participle registers the phi-features of the head noun (via the operator):

(15) la chanson OP_i que j' ai écrit-e __i
the song.F.S Op C I have written-F.S
'the song I wrote' *French*

Hence, to account for Case attraction, we propose that N has a Case-probe-feature in addition to its inherent [uCase]-feature; this probe-feature will enter into Agree with the RelP (in what follows, we omit the phi-probe for ease of representation):[13]

(16) $N_{[uCase],[*Case*]}$

[13]The intuition that the head noun and the relative operator have to communicate somehow can be found in several places in the literature, but the precise properties of the relationship are hardly ever made explicit. Rather, the generalization is only rephrased in prose but not technically implemented. Representative examples are Harbert (1983:246) who proposes "that case is first assigned to NP [...] and is transmitted by attraction from that head to the relative pronoun in COMP, subject to a hierarchical restriction ..." and Gračanin-Yuksek (2013:43, fn. 18) according to whom "... attraction involves an operation in which the case features of the internal head are copied onto the external head" but admits that "the details of this process remain mysterious".

Recall that attraction is not available in all languages; even in those that have it, it is optional. Consequently, we have to parameterize the presence of the Case-probe on N:

(17) a. optional (languages with Case attraction)
b. prohibited (languages without Case attraction, e.g., Modern German)
c. obligatory (Swiss German, see Sect. 3.2.2 below)

While the first two options are obvious, we propose that the third logical possibility, the obligatoriness of the Case-probe on N and thus of Case attraction, is also attested. As we will show below, this derives the pattern of gaps and resumptives in Swiss German.

(vi) To implement the hierarchy effect in (6), we make the following assumptions about Case features: first, Cases are decomposed (see e.g. McFadden 2004 and references cited there): traditional Case-labels are replaced by bundles of (more abstract) privative Case-features. Second, the more marked/oblique a Case is, the more features it is composed of, see Béjar and Řezáč (2009) for person and Caha (2009) and Assmann (2013) for Case. The markedness/obliqueness hierarchy is as follows:

(18) Gen $\succ$ Dat $\succ$ Acc $\succ$ Nom

The individual Cases then receive the following abstract specifications:

(19) Case-decomposition

Nom	α			
Acc	α	β		
Dat	α	β	γ	
Gen	α	β	γ	δ

Importantly, this feature decomposition holds for both probes and goals. For ease of representation, we will use the traditional Case-labels in the rest of this article, but it should always be borne in mind that they actually refer to feature bundles.

Finally, we adopt the head-external analysis of relative clauses but assume that RCs are merged as complements of N.[14,15]

[14] As far as we can tell, our argument is independent of a particular theory of relative clauses. All of what follows is certainly compatible with the matching analysis, see e.g. Sauerland (1998) and Salzmann (2006). We refrain from illustrating our derivations by means of the head-raising analysis because it involves certain complications with respect to DP-internal concord, which we feel would detract from the central points we want to make.

[15] If the noun additionally takes arguments or modifiers, RCs are attached to a projection of N. Given Bare Phrase Structure, selectional and probe-features will be present on the relevant label so that they c-command the RC. We assume a general rule that optionally assigns to an N a structure-building feature for the relative clause and a probe feature for Case-Agree with the operator (a metarule in the sense of GPSG, see Gazdar et al. 1985). While agreement in phi-features between N and the operator could also result from anaphoric agreement, Case attraction has to be ensured by a grammatical operation.

3.2 Top-down derivations

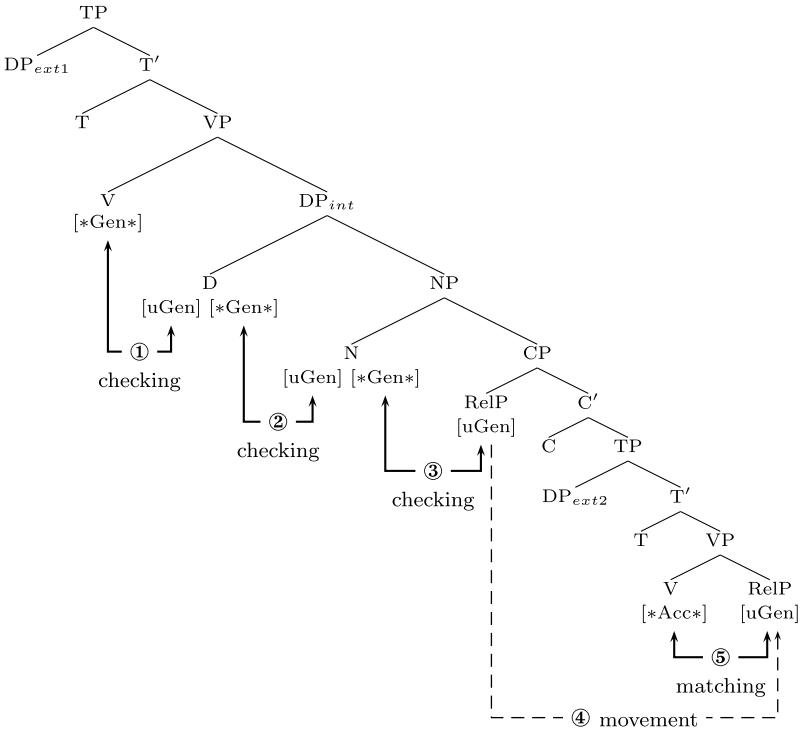
Given these assumptions, we will now provide a derivation for Case attraction before extending the analysis to Swiss German relative clauses.

3.2.1 Case attraction

Two components are at the heart of our analysis of Case attraction: first, the Agree relationship between the head noun N and the relative pronoun ensures that the matrix Case is passed down into the relative clause. Second, the possibility of Case-Agree under matching allows the relative pronoun to discharge a second Case-probe in addition to the probe on the head noun, viz., the RC-internal probe. The assumption that matching is only possible if the probe has a subset of the features of the goal derives the hierarchy effect which restricts Case attraction (recall (6)). That matching requires that the probe have a subset and not, for instance, a superset, is not a stipulation; rather it follows from the fact that this is the only way to discharge all Case-probe features.

We will now go through the three relevant scenarios: in the first scenario, the Case assigned by the matrix Case-probe is more oblique than that of the relative clause-internal one (genitive vs. accusative, allowing for attraction, see (20)). In the second scenario, both the matrix Case-probe and the RC-internal Case-probe assign the same Case (genitive in (21)). The third scenario is the reverse of the first: the relative clause-internal Case probe is more oblique than the one of the matrix clause, making attraction impossible. The derivation for the first scenario, cf. example (5-a), looks as in (20). First, the matrix verb checks Case with the external D ①. Then, D checks Case with N ② (DP-internal concord). Since the relative pronoun bears the same Case value as N, Case-checking is possible ③ (attraction). The relative pronoun then moves to its theta-position (with stopovers in intermediate phase edges not indicated in the following trees) ④. The crucial step is the last one: although the relative pronoun has already undergone Case-checking and bears a different Case than the relative clause-internal probe, the Case-probe can be discharged because its features constitute a subset of those of the relative pronoun ([α, β] vs. [α, β, γ, δ]), i.e. matching is successful ⑤, and the derivation converges. Hence, RelP bears matrix Case:

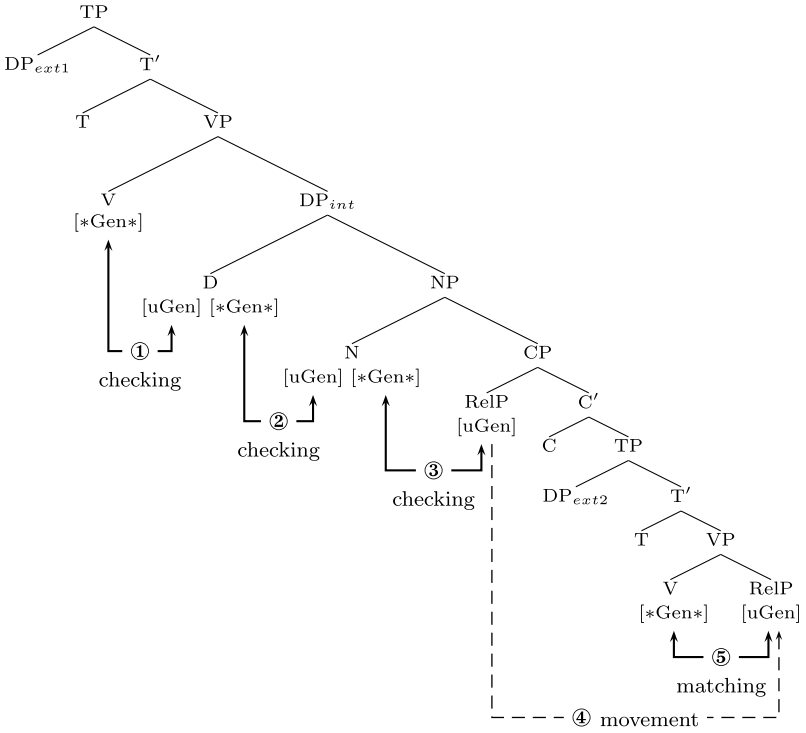
(20) Case attraction—top-down 1: MC=Gen; RC=Acc → RelP=Gen



If the relative pronoun were pre-specified for the RC-internal Case, i.e. for accusative, the derivation would crash because the Case-probe on N would fail to be checked (it would have a superset of the features of the operator). Hence, attraction must apply if there is a Case-probe on N.

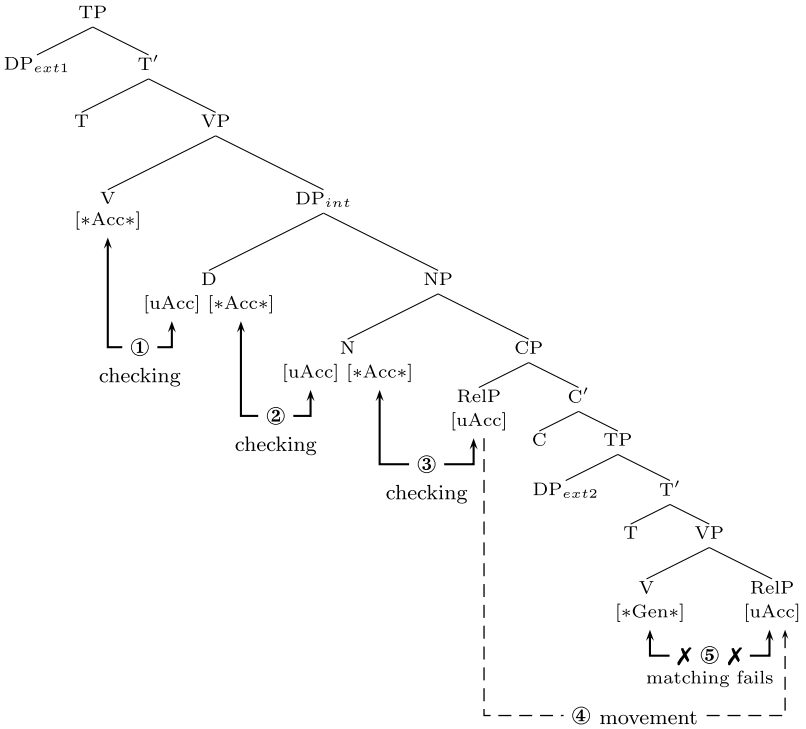
In the second scenario, both the MC- and the RC-Case-probe assign the same Case, viz., genitive. The derivation proceeds as in (21). First, the matrix Case-probe on V undergoes checking with the external D ①. Then, D checks Case with N ② (DP-internal concord). Thereafter, N checks Case with the relative pronoun ③ (attraction). The relative pronoun then moves to its theta-position ④. Although it has its Case feature already checked, it is still available for matching. Matching is felicitous because the relative clause-internal Case-probe has a subset of the features of the goal (identity of features also constitutes a subset). The Case features of the probe can thus be discharged and the derivation converges ⑤. The derivation of scenario two is thus essentially the same as in scenario one, the only difference being that matching involves a *proper* subset in scenario one:

(21) Case attraction—top-down 2: MC=Gen; RC=Gen → RelP=Gen



In the third scenario, the Case-probes differ again, but this time, the embedded Case probe (Gen) is more oblique than the one in the matrix clause (Acc). The derivation proceeds as in (22). First, the matrix verb checks Case with D ①. Then D checks Case with N ② (DP-internal concord). Thereafter, N checks Case with the relative pronoun ③ (attraction), which subsequently moves to its theta-position ④. However, discharge of the embedded Case probe under matching fails because it has a superset of the features of the relative pronoun ([α, β, γ, δ] vs. [α, β]). As a consequence, the derivation crashes:

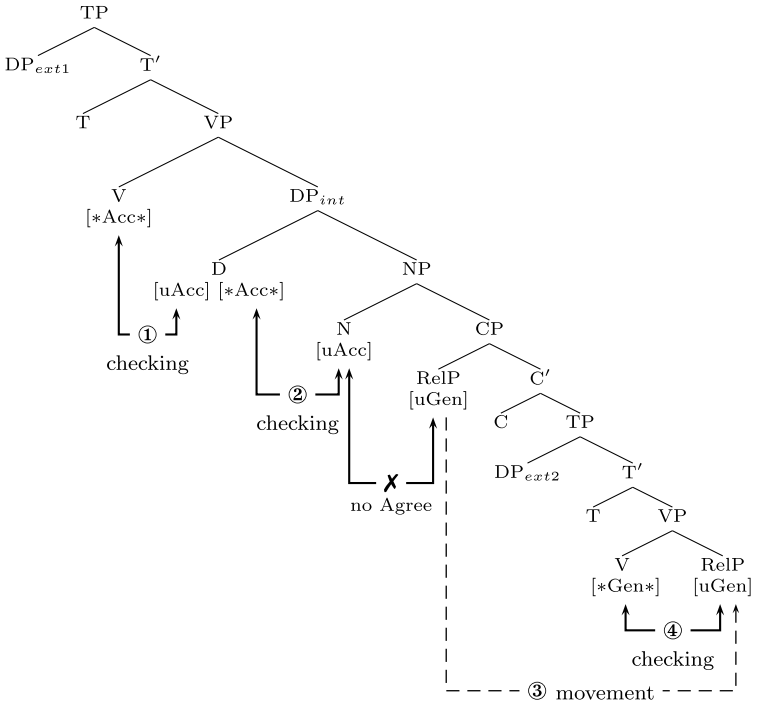
(22) Case attraction—top-down 3: MC=Acc; RC=Gen → crash



Case attraction (checking between N and RelP) is ruled out as a matter of principle if the matrix Case is less oblique than the RC-Case because this prevents matching inside the RC. A derivation with the RelP pre-specified for the RC-Case would also crash because checking between RelP and N would fail (due to non-identity of features).

The only grammatical solution in scenario 3 is the absence of attraction, which we model by the absence of the Case-probe on N. The derivation converges if the RelP is pre-specified for the RC-Case. The first steps are the same as in attraction: the matrix probe checks Case with D ① and D checks Case with N ②. But then, there is no Case-Agree between N and the relative pronoun. This allows the operator to have a Case different from the matrix Case probe. The relative pronoun then moves into its theta-position ③ where it undergoes Case-checking (not matching) with the embedded Case-probe ④:

(23) No Case-attraction—top-down 4: MC=Acc; RC=Gen → RelP=Gen



If in this scenario RelP were pre-specified for a different Case than the RC-internal Case-probe, Case-checking between them would fail and as a result the derivation would crash.

Absence of a Case-probe on N is needed in two further constellations (recall (17)): since attraction is generally optional in the languages where it is in principle available, there must also be a derivation without attraction even if the matrix Case is more oblique than the RC-Case. Finally, in languages like Modern German, which do not have any attraction at all, there is never a Case-probe on N.

To summarize the results so far: two factors make Case attraction possible: (a) N enters into an Agree relation with the relative pronoun. This implies that they have to be specified for the same Case given that checking requires identity of features. (b) Since discharge of probe-features is possible under matching, the derivation converges although the relative pronoun has already been involved in a checking operation with N and furthermore differs in Case-features from the RC-internal Case-probe. Since matching requires a subset relation, the hierarchy-effect in (6) is accounted for. Note that the possibility of discharge under matching is tightly constrained: it is only available if the goal-DP has already undergone Case-checking. Concerning the Case-probe on N, we have assumed that it is optional (in Case-attraction languages); given our assumptions, if it is present, there must be Case-attraction for the derivation to converge (RelP must be pre-specified for the

MC-Case); if it is absent, there cannot be attraction (RelP must be pre-specified for the RC-Case).[16]

3.2.2 Matching in resumption

Turning to matching in resumption, recall first the three scenarios we have to account for:

(24) Distribution of resumptives in Swiss German local relativization

MC-Case	RC-Case	result
Dat	Nom/Acc	gap
Dat Nom/Acc	Dat Nom/Acc	gap
Nom/Acc	Dat	resumptive

We propose to reinterpret these generalizations in terms of Case attraction even though there is no overt evidence for attraction since the relative operator (RelOP) in Swiss German is zero.[17] More precisely, the distribution in (24) follows under the assumption that Case-attraction, viz., the presence of a Case-probe on N, is obligatory. In the first scenario, the matrix Case is more oblique than the RC-Case, which is compatible with the hierarchy in (6): the embedded Case-probe is discharged under matching. In the third scenario, however, the reverse situation obtains and we argue that resumption is a means to rescue a derivation that is otherwise doomed to crash: the resumptive checks the embedded Case-probe which the relative operator cannot as it has fewer features than the probe. The second scenario, matching in resumption, is a subcase of attraction: discharge under matching is also possible if the Case features assigned in the MC and the RC are identical (both probes assign nominative, accusative or dative).

Note that nominative-accusative mismatches result in gaps in Swiss German (see (1-a)), even if they go against the hierarchy in (6), i.e. with the matrix Case being nominative and the embedded Case being accusative, as in (25):

(25) Das isch$_{nom}$ de Bueb, won i **(*en)** geschter gsee$_{acc}$ han.
this be.3S the.NOM boy C I (him) yesterday seen have.1S
'This is the boy who I saw yesterday.'

[16] Our system seems to encounter problems with inverse attraction (*attractio inversa*), where it appears that the embedded Case is imposed onto the head noun. However, there is good reason to believe that the construction involves a different structure (as pointed out, e.g., in Pittner 1995; Bianchi 2000; Riemsdijk 2006): in most examples of inverse attraction, there is a demonstrative/resumptive pronoun in the matrix clause (with matrix Case) resuming the head noun. This suggests that the construction rather represents a correlative or left-dislocation structure (for potential counter-examples see Grosu 1994:127 and Wood et al. to appear).

[17] See Gračanin-Yuksek (2013) for a related idea: she proposes that Croatian relative clauses involve inverse attraction (the Case-features of the internal head somehow percolate to the external head of the RC), but in fact she assumes an identity criterion that is more reminiscent of matching.

We propose that this is due to a slight difference in the Case hierarchy: nominative and accusative do not occupy different positions but rather represent the same type of Case, viz. unmarked Case:

(26) Dat ≻ unmarked (Nom, Acc)

More precisely, we assume that they have the same number of Case features (again, this holds for both probes and goals), and, given the hierarchy, a subset of the features of the dative (to allow for comparison with Case attraction, we will nevertheless use the labels Nom/Acc in our derivations). Independent motivation comes from Swiss German morphology: nominative and accusative are not morphologically distinguished except in personal pronouns (basically as in English). Apparent nominative-accusative mismatches thus actually represent instances of scenario 2, viz. matching (identity of the Cases in MC and RC).[18]

We are now ready to go through the three scenarios. The derivation for an example like (1-b), instantiating the first scenario, looks as in (27). In this scenario, the derivation proceeds exactly as in Case attraction, see (20): the matrix verb checks Case with D ①, D checks Case with N ②, and N checks Case with the operator ③. The operator subsequently moves to its theta-position ④, where it enters into an

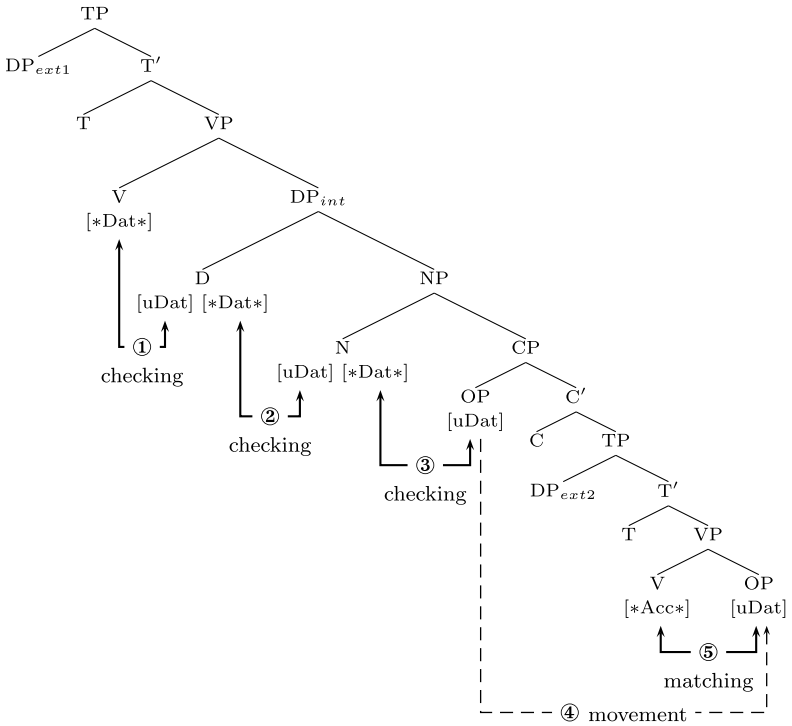
[18]The present case illustrates a morphology-syntax mismatch. In syntax, nominative and accusative behave the same (with respect to attraction), but morphologically they are distinguished; in Swiss German, the distinction is restricted to the personal pronoun paradigm. But in other languages like Modern Greek, where in free relatives nominative and accusative can be attracted to each other, the two Cases are morphologically differentiated both in pronominal and nominal paradigms. Given our syntactic approach to attraction, the two Cases must be represented by exactly the same set of privative Case features. To capture the morphological difference, we propose that exponents can be sensitive to the category of the head that checks Case on the DP, i.e. v/V vs. T (see Pesetsky and Torrego 2001). For concreteness' sake, we assume that DPs start out with an additional category feature [uF] that is checked against the categorial feature of the Case-checker. Vocabulary items can then refer to this feature. Note that this [uF] is not a proper Case-feature but a categorial feature that is checked as a by-product of Case-checking. Consequently, it does not count for the computation of subset relations and does not prevent matching. As pointed out to us by Klaus Abels, in Swiss German configurations with personal pronouns as heads, we predict gaps under nominative/accusative mismatches because the Cases are syntactically the same. This prediction is borne out:

(i) Er, wo __ /*en d Arbetskollege regelmässig schlönd$_{acc}$, bruucht$_{nom}$ dringend Hilf.
he C him the colleagues regularly beat up.3P need.3S urgently help
'He, who the colleagues beat up regularly, needs urgent help.'

Another morphology-syntax mismatch arises with syncretisms, which can resolve mismatches: for instance, German free relatives normally require identity between MC- and RC-Case; however, if the wh-pronoun *was* is used, which is syncretic for nominative and accusative, a Nom-Acc mismatch is tolerated. Syncretism effects have also been documented for Case attraction (Grosu 1994:126) and matching in resumption (see Salzmann 2006:353ff. for Swiss German and Gračanin-Yuksek 2013:29f. for Croatian). The obvious solution given our syntactic approach is that the features of the wh-phrase are modified during the derivation by means of Enrichment (see Müller 2007 for this concept). Concretely, a wh-phrase bearing nominative would be enriched with another Case feature (leading to the representation of the accusative) after Case-checking with N. Enrichment is restricted to certain morpho-syntactic contexts (it only applies to neuter wh-pronouns in German). This would basically be the analogue of the post-syntactic impoverishment rules adopted for the same purpose in Assmann (2014).

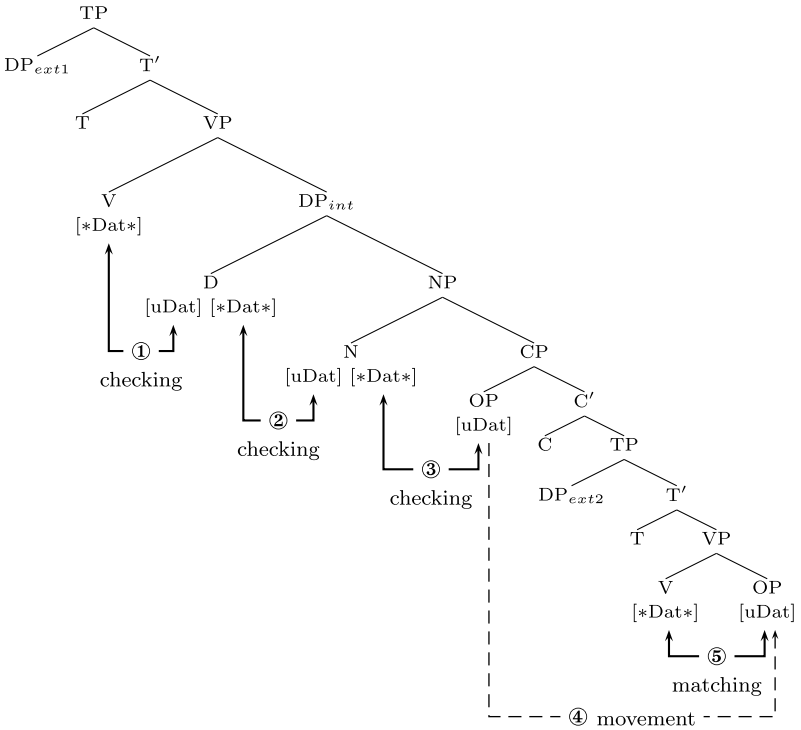
Agree relation with the embedded Case probe. Although the operator has already been involved in Case checking and bears a Case different from the embedded Case-probe, the derivation converges because discharge is possible under matching: the embedded Case-probe has a subset of the features of the goal ⑤. The result is a gap-relative:

(27) Resumption—top-down 1: MC=Dat; RC=Acc → gap



The second scenario, the matching in resumption configuration, is straightforward as it is essentially a variant of the first: the RC-probe can be discharged under matching. The derivation of an example like (4-a) proceeds as in (28) (compare (21)): as in previous derivations, the matrix verb checks Case with D ①, D checks Case with N ②, and N checks Case with the relative operator ③. The relative operator subsequently moves to its theta-position ④. Since it has the same features as the embedded Case-probe, discharge under matching is possible ⑤ and the derivation converges, resulting in a gap derivation. When unmarked Case is assigned both in the MC and in the RC (as in (1-a) and (25)), the same matching derivation obtains. Matching is thus simply a subcase of attraction under our analysis:

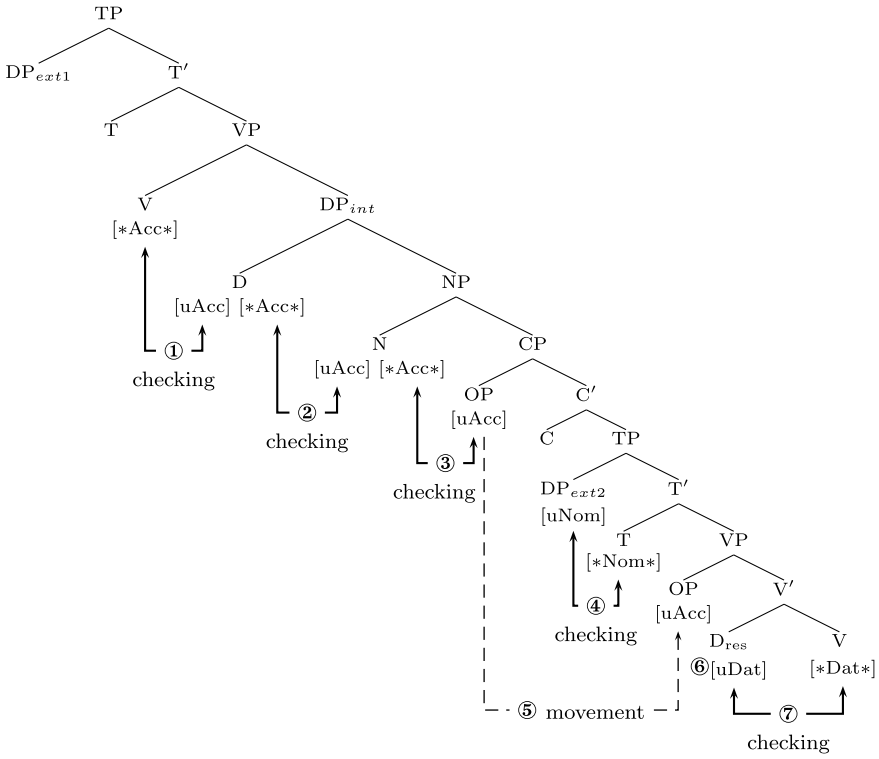
(28) Resumption—top-down 2: MC=Dat; RC=Dat → gap



Recall that matching in resumption presents a problem for all previous approaches to the gap-resumptive complementarity as it seems to require the inspection of large parts of structure that span several phase-boundaries. In our approach, however, the information about the Case of the head noun is locally available inside the RC through Case-attraction and downward movement of the operator. The matching effect thus falls out directly in our system; no construction-specific assumptions are necessary.

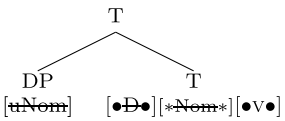
The third scenario corresponds to the configuration where Case attraction is blocked as the matrix Case is less oblique than the embedded Case, see (22). In the languages discussed in the previous subsection, a derivation with a Case-probe on N crashes; because of the optionality of the Case-probe on N, there is a converging non-attraction derivation for this scenario, see (23). In languages like Swiss German, however, where by assumption the Case-probe on N is obligatory, the non-attraction derivation is not a possibility. Instead, resumption provides a repair to rescue the attraction derivation. The derivation of an example like (1-c) proceeds as follows:

(29) Resumption—top-down 3: MC=Acc; RC=Dat → resumptive

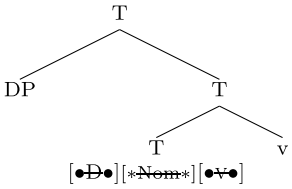


The first steps are again the same as in Case attraction: the matrix verb checks Case with D ①, D checks Case with N ②, and N checks Case with the relative operator ③. We now need to have a closer look at the derivation in the RC. We begin at the point when T and the subject have been merged. In this configuration, the subject checks T's [•D•]- and [∗Nom∗]-feature ④, see (30-a); note that Case-Agree is possible because they are sisters at this point of the derivation (not visible in the output representation in (29)). Then, T's selectional feature [•v•] is discharged as a consequence of which v is merged as a sister of T, see (30-b):

(30) a.



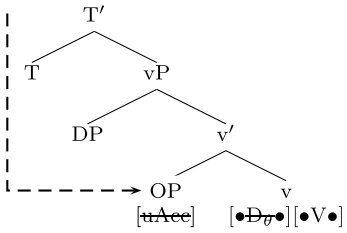
b.



Thereafter, v's structure building features are discharged one after the other. First, the subject, being closer than RelOP, is lowered and becomes a sister of v, checking

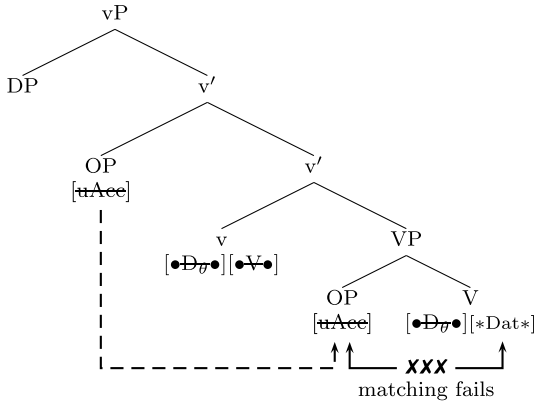
[•D$_\theta$•] (a structure-building feature associated with a θ-role). Then, assuming that vP and CP are phases, the relative operator makes an intermediate movement step (on the trigger for successive-cyclic movement, see Sect. 4.2) and becomes a sister of v, see (31):

(31)



There is no Case-checking at the level of vP as we assume that object Case is checked by V.[19] In the next step V is selected by v and triggers movement of RelOP into its theta-position, checking [•D$_\theta$•] ⑤:

(32)

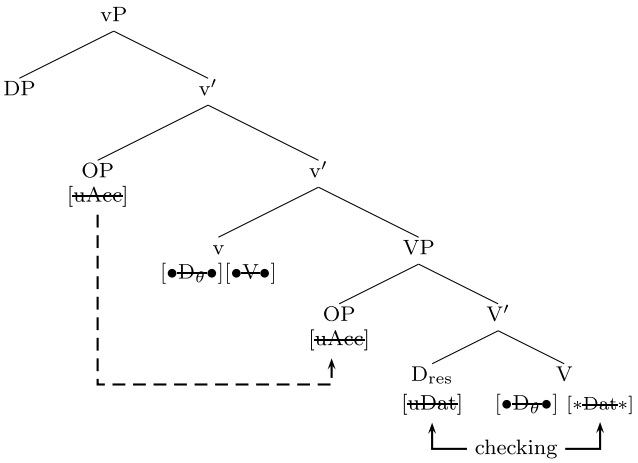


This is the configuration where the operator normally enters Case-Agree with the embedded probe. Crucially, in this scenario, however, the operator cannot undergo matching with the embedded probe as the probe does not have a subset of the operator's features. If nothing happens—as in Case attraction, cf. (22)—the derivation is doomed to crash. Languages with resumption, however, have a means to

[19]The assumption that object Case is not assigned by the head which projects the theta-position of the external argument but by a lower head (see e.g. Harley 2009 for this assumption) is necessary in our approach for the following reason: in a language like Swiss German where nominative and accusative are represented by the same set of features, the subject could discharge the v-Case under matching when it is moved to SpecvP. This would leave no Case-probe for the object (especially if introduced in VP), leading to a crash of the derivation. This problem does not arise if the object Case is checked by a lower head into whose projection the subject does not move. Nor does it arise in languages where the object Case contains a proper superset of the features of the nominative, as in the languages discussed in Sect. 3.2.1.

repair such derivations: a pronoun can be drawn from the lexicon and be merged as a last resort ⑥ to check the RC-internal Case-probe. The derivation converges if the pronoun is pre-specified for the same Case as the probe, viz., dative in our example ⑦:

(33)



It has to be ruled out that instead of inserting a resumptive, a D-element is merged from the numeration. We assume that this is blocked by the condition that D-elements from the numeration can only be externally merged if they check a structure-building feature. In the case at hand, this is not possible since the operator has already checked the [•D$_\theta$•] of V, cf. (33). Resumptives, however, are never part of the initial numeration (see Aoun et al. 2001) and hence are not subject to this condition. At the same time, since they do not come from the numeration, their insertion is usually blocked by inclusiveness. They can be inserted nevertheless if this is the only way to prevent unchecked features.[20,21]

In a final step, the operator binds the resumptive, ensuring agreement in phi-features. Note that the phi-features of the resumptive can in principle be chosen freely. But binding will only be successful if it bears the same phi-features as the operator. If binding fails due to feature mismatch, the structure is ruled out by the ban on vacuous quantification. This ban also explains why the repair must involve a pronoun (and not other conceivable repairs such as deletion of the RC-internal probe). Note that this

[20] One could imagine that the operator actually moves into the projection of the resumptive so that a Big-DP-structure arises, see Boeckx (2003). However, given that the analysis of resumption in islands in Sect. 4.2 below is incompatible with a Big-DP-structure (because the operator does not reach the theta-position), a uniform analysis requires the absence of a Big-DP structure here as well. Consequently, the operator stops in a position above its theta-position; the result is thus a hybrid movement/base-generation analysis. While this may seem strange at first sight, this is actually an instance of partial movement; similar assumptions can be found in Guilliot (2006:1905) and Sells (1984:330). For thematic licensing, see fn. 28.

[21] As discussed in Salzmann (2013) there is both dialectal and inter-speaker variation with respect to dative relativization. In some dialects/idiolects, gap relatives are available outside of the matching configuration. These gap relatives can be accounted for if there is no Case-Agree between N and the operator: rather, the operator can be specified for dative and check the embedded Case probe.

is a side-effect of the (partial) base-generation approach chosen here while under spell-out or Big-DP-approaches, it is not so obvious why the repair should involve a pronoun.[22]

Note that the representation in (33) does not account for the fact mentioned at the beginning that resumptives in Swiss German generally occur in the Wackernagel position, thus in a higher position than where we have introduced them. This is a necessary consequence of their treatment in terms of local repair. We assume, adopting insights by Richards (2006), that weak pronoun movement to the middle field takes place post-syntactically. The major argument for this view is the fact that what the fronted elements have in common is their prosodic deficiency (they cannot form a prosodic word on their own) while alternative characterizations in terms of information structure, Case etc. fail. Fronting occurs for the pronoun to be able to integrate prosodically into a host within the same phonological phrase. Assuming that phases constitute phonological phrases, the object pronouns, being enclitic, have to leave VP. See Weber (1987:155–162) for details about their morphonological properties.

Importantly, what we have just postulated covertly for Swiss German, namely that the operator bears MC-Case while the resumptive bears RC-Case, can be found overtly in free relative clauses in Modern Greek: in the following example the relative pronoun bears (via the silent external D) the Case of the matrix verb while the oblique Case of the RC-internal probe is checked by a resumptive clitic (Alexiadou and Varlokosta 2007:229):

(34) tha voithiso$_{acc}$ opjon tu dosis$_{gen}$ to onoma mu
FUT help.1S who.ACC 3S.M.GEN give.2S the name my
'I help whoever you give my name.' *Modern Greek*

To summarize matching in resumption: essentially, headed relative clauses in Swiss German involve obligatory Case attraction. In configurations where the matrix Case is more oblique than (scenario 1) or as oblique as (scenario 2) the RC-Case, the embedded Case probe can be discharged under matching, resulting in gaps; matching in resumption is thus a subcase of Case attraction. In scenario 3, discharge under matching is impossible and resumption functions as a last resort, guaranteeing the discharge of the embedded Case probe.[23]

[22] Since the link between operator and resumptive can span island boundaries and since, as we will show below, there is no movement into islands, binding cannot involve Agree; rather, as with variable binding, c-command is sufficient. Resumptives generally correspond to regular pronouns independently available in the language, cf. Asudeh (2005, 2012); they are usually drawn from the weakest paradigm (clitic/weak pronouns), a preference which can be related to economy, see e.g. Pesetsky (1998).

[23] As shown in Spyropoulos (2011), inherent accusatives in Modern Greek cannot be attracted even if the matrix Case is more oblique (genitive). This can be accounted for if inherent accusatives are PPs underlyingly and hence constitute islands (cf. Landau 2010). Consequently, the RelP cannot move into the PP and enter Case-Agree with P; instead, as correctly predicted under our approach, a resumptive is inserted as a repair. See Sect. 4.2 for details about island derivations. We thank an anonymous reviewer for raising this important issue.

3.2.3 Attraction and predicative modifiers

Postulating attraction in Swiss German relative clauses makes a prediction that at first sight does not seem to be borne out: given that RelOP bears the matrix Case, e.g., dative, one would expect secondary predicates related to the operator to agree with it in Case as is the general rule in the language. However, the secondary predicate bears the Case required by the embedded Case probe. In the following example corresponding to scenario 1, the secondary predicate bears unmarked Case although the relative operator bears dative according to our analysis:

(35) Ich hilf$_{dat}$ em Maa, wo s als {eerschte / *eerschtem}
I help.1S the.DAT man C they as first.S.NOM-ACC first.S.DAT
bringed$_{acc}$.
bring.3P
'I will help the man who they bring first.'

In scenario 3, the secondary predicate agrees with the resumptive in Case, not with the relative operator, which according to our analysis bears unmarked Case:

(36) Ich suech$_{acc}$ de Maa, wo s em als {*eerschte / eerschtem}
I search.1S the man C they he.DAT as first.S.NOM-ACC first.S.DAT
ghulffe$_{dat}$ händ.
helped have.3P
'I am looking for the man who they helped first.'

Interestingly, though, overt Case attraction in Modern Greek behaves the same (we are grateful to Marika Lekakou for providing the following examples, see also Spyropoulos 2011:35f.): predicative elements do not agree with the attracted relative pronoun but rather bear the Case of the embedded Case probe. The following examples illustrate this for scenarios 1 and 3 (*o idios*, literally 'same', is an intensifier akin to *himself*):

(37) a. tha dosume$_{gen}$ opju erthi$_{nom}$ o {idjos / *tu idju}
FUT give.1P who.GEN come.3S the same.NOM the same.GEN
ena vivlio
a book.ACC
'We will give a book to whoever comes in person (lit. himself).'

b. tha voithiso$_{acc}$ opjon tu dosis$_{gen}$ to onoma mu {*ton
FUT help.1S who.ACC 3S.M.GEN give.2S the name my the
idion / tu idiu}
same.ACC the same.GEN
'I will help whoever you give my name in person.'

This shows that the behavior of secondary predicates does not falsify our assumption that the operator in Swiss German bears matrix Case.

Note that in other languages such as Ancient Greek, the reverse pattern can be (optionally) found: the secondary predicate agrees with the RelP and thus the MC-Case, cf. Quicoli (1982:164ff.):

(38) emmenomen$_{dat}$ hois hōmologēsamen$_{acc}$ dikaiois
abide.by.1P which.PL.DAT agree.PFV.1P just.PL.DAT
ousi e ou?
being.PL.DAT or not
'Do we abide by those things which we consider just or not?'
Ancient Greek

This pattern follows straightforwardly under our account: we assume that the secondary predicate bears a Case-probe that is checked against the Case features of RelP; since it is introduced after the RelP, which bears the matrix Case, the predicate has to be specified for matrix Case as well. However, the pattern in scenario 1 in Swiss German and Modern Greek requires additional assumptions under our approach (scenario 3 is unproblematic since the predicate agrees with the closer resumptive rather than the relative pronoun): to account for the agreement in scenario 1, we propose that the predicative element checks its Case against the features of its subject that were *last* involved in Case-Agree, i.e. the features involved in matching with the RC-internal probe, hence a subset of the features of the RelP.

Note that the reverse situation obtains for bottom-up approaches: the Modern Greek and Swiss German pattern follows straightforwardly under overwriting/Case-stacking while the derivation of the Ancient Greek pattern in (38) is problematic: it is unclear how the matrix Case can end up on the predicative element as there will be phase-boundaries between the RelP and the predicate. Consequently, this variation remains a challenge irrespective of the direction of the derivation and requires special assumptions.[24]

4 Local modeling of the gap/resumptive complementarity

The previous section has shown that once the possibility of matching and a checking approach to Case-Agree are adopted, the attested patterns in Case attraction and resumption can be derived straightforwardly in a top-down-approach. We will now show that although Case attraction can be derived bottom-up as well with these modifications, the complementarity between gaps and resumptives only follows under top-down derivation.

[24]Our proposal that in Swiss German RelOP is Case-marked runs counter to the generalization established in Merchant (2004) according to which operators that bind resumptives (in islands) are always Case-invariant (often zero). Our approach predicts that operators that bind resumptives can bear Case. However, since operators that co-occur with resumptives are silent in most languages for independent reasons, the prediction is difficult to test.

4.1 Dative resumption

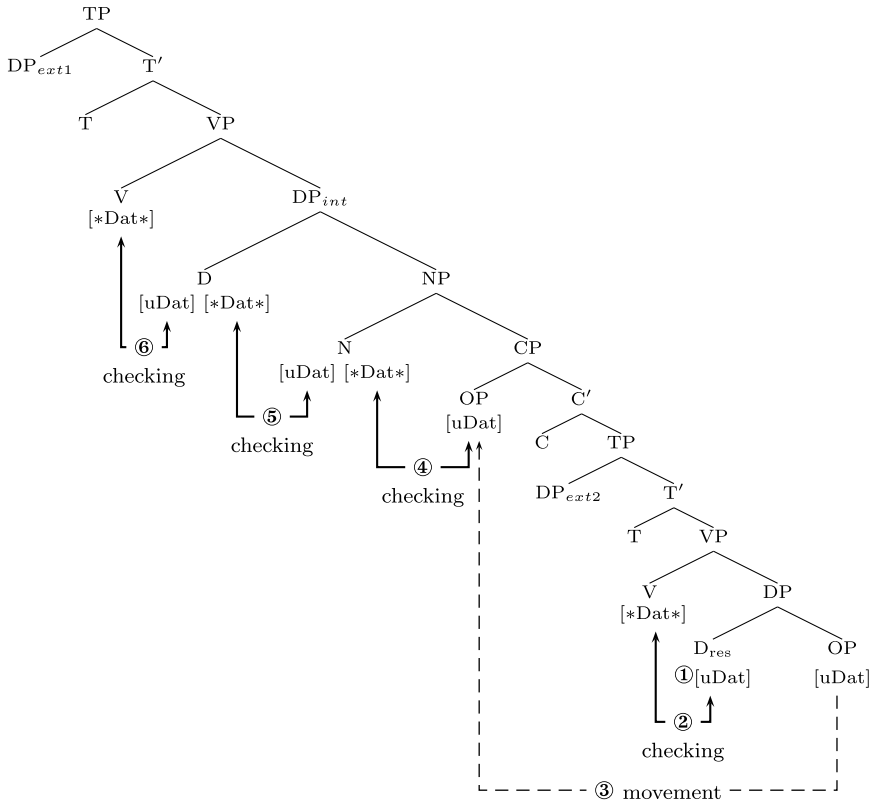
In a bottom-up approach, the conditions on checking and matching need to be reversed: matching requires identity of features while checking is possible if the probe has a subset of the Case-features of the goal. The attraction derivation (scenario 1) converges if RelP starts out with the MC-Case: RelP checks the RC-internal probe which bears a subset of RelP's features; subsequently, RelP, which still has unchecked Case-features, checks the Case-probe on N that bears the identical Case-feature set (which also constitutes a subset). This derivation avoids the criticism leveled against bottom-up approaches in Sect. 2.

Crucially, while Case attraction can be modeled bottom-up, this does not hold for the complementary distribution of gaps and resumptives. In a nutshell, the problem for a bottom-up derivation of resumption is the following: as pointed out in the introduction, the crucial information for the choice between gap and resumptive (the Case of the head noun) is not available at the point of the derivation when the decision would have to be made. Thus, resumption cannot be treated as a *local* repair. If it is modeled as a repair, the insertion of a resumptive will necessarily involve backtracking/be counter-cyclic, as e.g. in Aoun et al. (2001).[25] If instead resumptive derivations are freely available, i.e. if resumptives can be present from the beginning, they must be blocked in the relevant contexts. This will require comparison again, unless the resumptive derivation can be made to crash. However, as we will now show, it is not obvious how this can be done in the case at hand.

Let us focus again on the matching configuration, viz., scenario 2, under bottom-up with the new conditions on checking/matching. The gap derivation is straightforward: RelOP starts out with dative and undergoes checking with the RC-internal dative probe. Then, RelOP moves to the left periphery where it undergoes matching with the head noun bearing a dative probe we well. Matching is the only possibility because RelOP's Case features have already been checked. Crucially, however, a derivation that starts out with a resumptive converges as well, see (39):

[25] Note that this problem is even more serious if Case-Agree between the head noun and RelP is handled at PF (as in the PF-approaches to Case attraction discussed in Sect. 2) since the crucial information about the Case of the head noun becomes available even later.

(39) Resumption—bottom-up: MC=Dat; RC=Dat → *resumptive

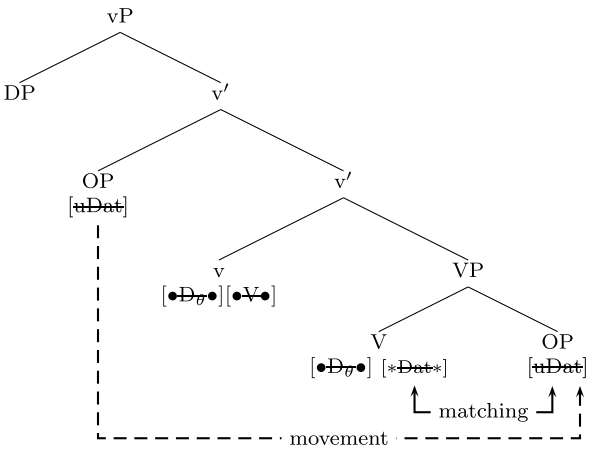


Suppose that we start out with a big-DP structure with the resumptive as its head and the operator as the complement (or specifier) ①. Since the resumptive is the head of the DP, it checks the embedded Case-probe ②. The operator, which has not been involved in Case-Agree, moves to the left periphery ③ and undergoes checking with N ④. Finally, N checks Case with D ⑤ and D with v ⑥. The same result obtains if instead of postulating a Big-DP, the operator is base-generated in SpecCP. Equivalent converging derivations with resumptives can be generated for subjects and direct objects in the matching configuration (scenario 2). Consequently, to rule out the resumptive derivation, the bottom-up approach has to resort to global comparison.

Crucially, top-down derivation is not confronted with this problem: the choice between gap and resumptive in the matching configuration can be made locally because the relevant information about the matrix Case is available on the relative operator due to early Case-attraction. To illustrate this, we take a closer look at the VP-cycle inside the RC (recall that under top-down, checking requires identity of features while matching requires a subset relation). The operator moves from its intermediate landing site in SpecvP into VP, where it checks V's [•D$_\theta$•]-feature; additionally, V's Case

probe can be discharged under matching. Since all features are discharged, the derivation converges, see (40).

(40)



Insertion of a resumptive instead of downward movement of the operator is blocked by inclusiveness because resumptives are a last resort: the system first exhausts the accessible elements in the workspace and in the numeration. Only if this is not sufficient to satisfy all features is the insertion of a resumptive possible.

In the non-matching scenario 3, where the matrix Case is less oblique than the RC-Case, things are different: no element in the workspace/numeration can check the RC-Case-probe so that the insertion of a resumptive is the only way to save the derivation, recall (32)–(33).

Crucially, the decision to insert a resumptive can be made locally by inspecting the minimal XP dominating the Case-probe and its sister, the moved operator. There is just one converging derivation in each configuration: if the MC-Case is less oblique than the RC-Case, the gap derivation simply crashes; if the MC-Case is more oblique than or as oblique as the RC-Case, the gap derivation converges while the resumptive derivation cannot even be generated since resumption is a last resort. No backtracking or transderivational Economy is needed since the information about the Case of the head noun is locally available on the operator. This is a significant improvement over previous accounts (see Sect. 1) and provides an important argument in favor of top-down derivation.

4.2 Resumption in islands

So far we have only addressed resumptives outside islands, viz., dative resumptives in local relativization. We now turn to resumption in islands, where resumptives are required across the board. The example (2-a) with subject relativization is repeated in (41):

(41) Das isch$_{nom}$ de Politiker, wo d ⟨ Behäuptig, dass ***(er)** d Susi küsst
this be.3S the politician C the claim that he the Susi kissed
hät$_{nom}$ ⟩, nöd stimmt.
have.3S not be.correct.3S
lit.: 'This is the politician that the claim that he kissed Susi is wrong.'

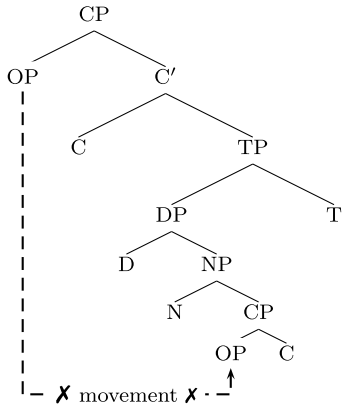
What is different in this case is that we assume that the operator is stuck above the island and thus cannot reach its theta-position: given the standard locality constraints on movement, the operator only moves as far as it can. Consequently, there is an argument missing for the predicates in the island. We propose that a resumptive is inserted as a repair to satisfy a [•D$_\theta$•]-feature. Technically, we assume a constraint that checks whether at a given point of the derivation (the phase level) there is a sufficient number of accessible arguments for the [•D$_\theta$•]-features in the numeration that are still to be discharged (we thus assume that arguments can check only one [•D$_\theta$•]-feature, hence, once a DP has reached its theta-position, it is frozen). Arguments are accessible if they are either (a) part of the numeration or (b) accessible in the derivation, i.e. located in positions from where successive-cyclic movement is possible, viz, phase edges. This idea essentially adapts the concept of Phase Balance by Heck and Müller (2000) from bottom-up- to top-down-movement. If an operator is stuck at an island boundary, it is no longer accessible for checking of [•D$_\theta$•]-features in the island. This imbalance triggers the insertion of a resumptive into the numeration. From this point on, the resumptive can be externally merged into the derivation. Since it is part of the numeration, it does not have to be merged immediately. This is a welcome result because resumptives generally occur in theta-positions and not in higher positions, e.g., just below the island. Balancing the number of arguments w.r.t. the number of [•D$_\theta$•]-features to be discharged in the course of the derivation is independently required: first, a constraint along these lines is necessary to put together initial numerations (otherwise, if numerations can be chosen completely freely, they will crash in most cases). Second, this is the obvious trigger for successive-cyclic movement under top-down derivation: argument XPs are kept accessible (through movement via phase edges) to eventually allow for the checking of D$_\theta$-features just like successive-cyclic movement allows a wh-phrase to remain accessible for the wh-feature of the topmost C-head under bottom-up.[26]

Suppose we try to relativize a subject inside an island as in (41): the operator will be merged in SpecCP of the relative clause. At a later point, the subject DP, including a CP-complement, is merged. This constitutes a CNPC-island (we will remain agnostic as to what causes the island). At the point where C is merged with N, Phase Balance applies and checks whether at the CP-phase-level there are as many accessible arguments as there are [•D$_\theta$•]-features still to be discharged. Ignoring the predi-

[26] We thus assume that numerations are *balanced from the start*. As a consequence, initial numerations where there is an argument missing will not be submitted to the derivation. Phase Balance then keeps checking the balance during the derivation. Crucially, derivations can become unbalanced, e.g., if an operator gets stuck outside of an island. Repair by resumption is thus strongly restricted.

cate ‘be correct’ and its argument, the sentential subject, there are two θ-roles to be discharged, viz., those of ‘kiss’. There is one accessible D-element in the numeration (‘the’ of ‘the Susi’). This implies that to balance the CP-phase, the operator would have to move to SpecCP (the sister of C at this point), but for reasons of locality, this is blocked:

(42)

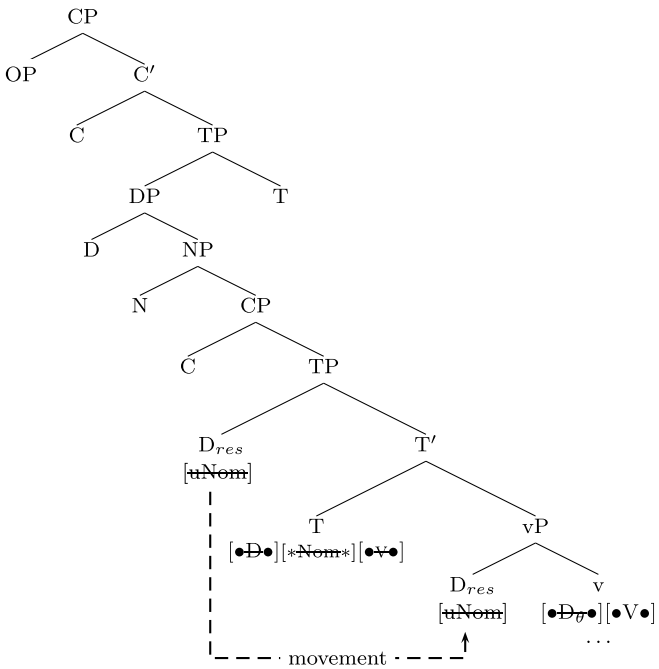


Since repair-driven movement of the operator is blocked, Phase Balance has to be satisfied differently: as a repair, a resumptive is added to the numeration. This resumptive will be merged when the EPP-feature of T is to be discharged. It also checks the [∗Nom∗]-feature of T and subsequently moves into vP and checks v’s [•D$_\theta$•]-feature, see (43):[27,28]

[27]In a language like Swiss German where nominative and accusative are not distinguished, one could in principle also merge the other, non-resumptive argument present in the numeration in SpecTP. The resumptive would then be merged as a direct object, leading to object relativization. In languages where the Cases are distinct, the Case values on the DPs determine where they can be merged as Case-*checking* requires identical features.

[28]Unlike in non-island contexts, it is the resumptive and not the operator that checks the D$_\theta$-feature in island-contexts. This implies that one of the two elements does not receive a theta-role in the syntax. We assume that this element is thematically-licensed through binding; recall that the operator binds the resumptive (which also ensures agreement in phi-features) so that the two share a theta-role. Note that this way of thematic licensing is an independent property of base-generation orthogonal to the bottom-up/top-down distinction. Our approach implies that thematic licensing does not involve checking of uninterpretable features on DPs; rather, thematic interpretation is the result of structural configurations.

(43)



Note that this implies that resumption inside islands does not involve movement, at least not all the way down to the theta-position. Independent evidence for this assumption comes from matching: if the indirect object is within an island, a resumptive is necessary even if the head noun bears dative as well (the same holds for matching in Croatian resumptive relatives, see Gračanin-Yuksek 2013:32f.):

(44) Ich han **em** **Bueb**, wo du kän Lehrer känsch, ⟨ won ***(em)**
I have.1S the.DAT boy C you no teacher know.2S C he.DAT
vil zuetrout$_{dat}$ ⟩, es Komplimänt gmacht$_{dat}$.
much consider.capable.3S a compliment made
lit.: 'I made the boy that I don't know a single teacher who considers him capable of much a compliment.' *Swiss German*

If there were movement into the island as assumed in movement-based approaches to resumption (see Salzmann 2013 for an overview of theories), the necessity of resumption would come as a surprise.

There are thus two factors that trigger resumption in our system: (i) They are inserted to satisfy a Case-probe that would otherwise go unchecked (dative resumptives in local relativization); (ii) they are inserted to provide a checker for a [•D_θ•]-feature (resumptives in islands). The fact that the matching effect is only at work in the first context shows that the two contexts need to be treated differently.[29]

[29]The proposal that resumption in island contexts largely involves base-generation while resumption in non-island contexts involves movement (cf. also Aoun et al. 2001 and Bianchi 2004) seems to predict

The following table summarizes the complete distributional pattern of gaps and resumptives in Swiss German relativization, including islands; recall that long-distance relativization patterns like island-configurations in requiring resumptives across the board because the finite clause-boundary constitutes an island for relativization. Consequently, there is also no matching effect in long relativization:

(45) Distribution of resumptives in Swiss German relativization

MC-Case	RC-Case	local relativization	islands/long rel.
Dat	Nom/Acc	gap	resumptive
Dat Nom/Acc	Dat Nom/Acc	gap	resumptive
Nom/Acc	Dat	resumptive	resumptive

4.3 General implications for resumption

The Case attraction approach to resumption under top-down derivation has two further interesting consequences: first, it provides a motivation for the unbalanced distribution of resumptives across Ā-constructions: resumptives are most frequent in relative clauses (and in constructions based on RCs such as clefts) but are somewhat rare in wh-movement, see Boeckx (2003). The reason for this is that in relativization the operator can undergo Case checking with the head noun so that it is Case-licensed even if it does not undergo Case-Agree with the RC-internal probe (which is discharged by the resumptive). In wh-movement, however, since there is no head noun, the operator can only check Case (and thus be licensed) with its predicate so that no Case-probe feature remains that would require the insertion of a resumptive. Conversely, if the resumptive checked the Case feature, the wh-phrase could not be Case-licensed. For languages that do have resumption outside of relativization, one can assume that they have additional means to license base-generated operators or that the resumptive has a different status (is part of clitic-doubling/is just an agreement element).

Second, resumption is related to Case- and D_θ-features in our approach, i.e., it is a repair that applies in order to discharge Case-probes/satisfy D_θ-features that would otherwise go unchecked. This accounts for the fact that one does not find adverbial resumptives cross-linguistically, see Boeckx (2003:37f.). Additionally, this fact suggests that adjuncts are not introduced by structure-building features (which might trigger the insertion of adverbial resumptives in island contexts).

reconstruction asymmetries. However, given the data in Guilliot and Malkawi (2006) and the proposal that reconstruction under resumption (in islands) can be modeled under the NP-ellipsis theory of resumption, movement vs. base-generation do not necessarily make different predictions with respect to reconstruction. One would probably expect the absence of reconstruction into intermediate positions in the island case (see also Rouveret 2008:186), but since these facts are extremely subtle and hard to substantiate empirically, we will not pursue this issue any further.

5 Conclusion

Languages where gaps and resumptives are in complementary distribution pose an interesting challenge to local derivational bottom-up theories of syntax: the choice between the two strategies has to be made at the point when the theta-position is projected into the structure. However, the factors which govern this choice (e.g. an island higher up in the structure) are not yet syntactically present. The hitherto unstudied matching effect discussed in this paper is particularly crucial: the choice between gap/resumptive in the relativization of indirect objects depends on the Case of the head noun and is thus unrelated to islandhood (which is usually used to motivate dative resumptives). All previous approaches have to resort to transderivational economy or at least inspection of large parts of structure spanning the standard phase-boundaries to deal with the complementarity.

We have argued that a local solution is possible under the following assumptions: first, the distribution of resumption is reinterpreted in terms of Case attraction. Second, the derivation unfolds top-down. As a consequence, the necessary information, the Case of the head noun, is locally available on the operator. Concretely, (i) there is Case-Agree between the head noun and the relative operator in SpecCP. This passes the matrix Case into the relative clause. (ii) Case probes can also be discharged under matching, viz., even if the goal DP has already been involved in Case-Agree. This slight modification of the Activity Condition allows the RelP/RelOP to agree with two Case probes. (iii) Case features are decomposed. Together with explicit restrictions on checking/matching, this derives the generalization that attraction is limited to configurations where the matrix Case is more oblique than the RC-Case.

With these assumptions, our approach provides a coherent explanation for the distribution of gaps and resumptives as well as the matching effect: given obligatory Case attraction, gaps result whenever the relative operator (bearing the matrix Case) can discharge the relative clause-internal probe. Since all features are checked once the operator reaches its theta-position, insertion of a resumptive, which is analyzed as a repair, is not a possibility. Because of Case decomposition and the subset condition on matching, gaps occur if the matrix Case is more oblique than or as oblique as the RC-Case. Crucially, this accounts for the absence of resumptives under matching, which is simply a subcase of Case attraction. Resumptives are inserted as a last resort when the operator (bearing the matrix Case) cannot discharge the RC-Case-probe, i.e. when it bears fewer Case features than the probe. Consequently, in our proposal there is just one converging derivation in each context so that recourse to non-local devices is not necessary.

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