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On Variation in and across languages:
Case Matching Effects with Free Relatives and Parasitic Gaps in German and Polish

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1 Introduction

Most studies on variation are concerned with variation between different languages or dialects. However, there might also be variation between different constructions within one language.

The following study deals with case matching effects as they occur with free relatives and parasitic gaps. Interestingly, Polish is the mirror image of German: In German case mismatches are allowed with free relatives but not with parasitic gaps, in Polish case mismatches are allowed with parasitic gaps but not with free relatives.

(1) *Free relatives*
I'll buy what you are selling.

(2) *Parasitic gaps*
Which article did you file without reading?

(3) *Case mismatches*

	German	*Polish*
Free relatives	✓	*
Parasitic gaps	*	✓

The cross-linguistic variation shows that each construction can in principle be subject to a matching condition. Thus, an analysis is required that allows case matching in both constructions, but can still account for the distribution of case matching effects as shown in (3).

Claim:
The variation between Polish and German as well as the variation between the two constructions can be accounted for without parametrizing principles of narrow syntax. Instead, the variation is attributable to differences in the features of lexical items. Thus, the analysis is in line with basic tenets of the Minimalist Program.

2 Data

2.1 German (Pittner (1995); Vogel (2001); Fanselow (1993); Kathol (2001))

(4) *Parasitic gaps*

Matr/PG	Acc	Dat	Gen
Acc	✓	*	*
Dat	*	✓	✓(syn)
Gen	*	✓(syn)	✓

(5) *Free relatives*

Matr/FR	Acc	Dat	Gen
Acc	✓	✓(dat)	✓(gen)
Dat	*	✓	✓(gen)
Gen	✓(acc)	✓(dat)	✓

(6) *Parasitic gaps: strict case matching*

a. weil Hans die$_{acc}$ Frau [ohne anzusehen$_{acc}$] geküsst$_{acc}$ hat
because Hans the woman without to.look.at kissed has
"because Hans has kissed the woman without looking at her"

b. weil Hans der$_{dat}$ Frau [anstatt zu helfen$_{dat}$] schadete$_{dat}$
because Hans the woman instead.of to help hurt
"because Hans hurt the woman instead of helping her"

c. weil Hans *der$_{dat}$/*die$_{acc}$ Frau [anstatt zu helfen$_{dat}$] behinderte$_{acc}$
because Hans the woman instead.of to help hampered
"because Hans hampered the woman instead of helping her"

d. weil Hans *der$_{dat}$/*die$_{acc}$ Frau [anstatt zu behindern$_{acc}$] half$_{dat}$
because Hans the woman instead.of to hamper helped
"because Hans hampered the woman instead of helping her"

e. weil Hans der$_{gen/dat}$ Verstorbenen [anstatt ein Gedicht zu widmen$_{dat}$] in einer Gradrede gedachte$_{gen}$
because Hans the dead.one instead.of a poem to dedicate in a eulogy commemorate
"because Hans commemorated the dead one in a eulogy instead of dedicating a poem ot her"

(7) *Free relatives: absence of case matching (with case restrictions)*

a. Hans mag$_{acc}$ [wen$_{acc}$ (auch immer) Maria hasst$_{acc}$].
Hans likes who ever Maria hates
"Hans likes whoever Maria hates."

b. Hans hilft$_{dat}$ [wem$_{dat}$ (auch immer) er vertraut$_{dat}$].
Hans helps who ever he trusts
"Hans helps whoever he trusts."

c. Hans mag$_{acc}$ [*wen$_{acc}$/wem$_{dat}$ (auch immer) Maria vertraut$_{dat}$].
Hans likes who ever Maria trusts
"Hans likes whoever Maria trusts."

d. Hans vertraut$_{dat}$ [*wen$_{acc}$/*wem$_{dat}$ (auch immer) Maria mag$_{acc}$].
Hans trusts who ever Maria likes
"Hans trusts whoever Maria likes."

2.2 Polish (Citko (2013))

(8) *Parasitic gaps*

Matr/PG	Acc	Dat	Gen
Acc	✓	✓(acc)	✓(acc)
Dat	✓(dat)	✓	✓(syn)
Gen	✓(gen)	✓(syn)	✓

(9) *Free relatives*

Matr/FR	Acc	Dat	Gen
Acc	✓	*	✓(syn)
Dat	*	✓	*
Gen	✓(syn)	*	✓

(10) *Parasitic gaps: absence of strict case matching*

a. To jest dziewczyna, którą$_{acc}$ Jan tolerował$_{acc}$ [zanim polubił$_{acc}$].
this is girl which Jan tolerated before liked
"This is the girl Jan tolerated before he grew to like."

b. To jest dziewczyna, której$_{dat}$ Jan towarzyszył$_{dat}$ [zanim zaczął pomagać$_{dat}$].
this is girl which Jan accompanied before started help
"This is the girl who Jan kept company before he started to help."

c. To jest dziewczyna, <u>którą$_{acc}$/ *której$_{dat}$</u> Jan lubił$_{acc}$ [zanim zaczął pomagać$_{dat}$].
this is girl which Jan liked before started help
"This is the girl Jan liked before he started to help."

d. To jest dziewczyna, <u>której$_{dat}$/*którą$_{acc}$</u> Jan ufał$_{dat}$ [zanim polubił$_{acc}$].
this is girl which Jan trusted before liked
'This is the girl Jan trusted before he got to like.'

(11) *Free relatives: strict case matching*

a. Jan lubi$_{acc}$ [<u>kogokolwiek$_{acc}$</u> Maria lubi$_{acc}$].
Jan likes whoever Maria likes
"Jan likes whoever Maria likes."

b. Jan pomaga$_{dat}$ [<u>komukolwiek$_{dat}$</u> ufa$_{dat}$].
Jan helps whomever trusts
"Jan helps whomever he trusts."

c. Jan lubi$_{acc}$ [<u>*kogokolwiek$_{acc}$/*komukolwiek$_{dat}$</u> dokucza$_{dat}$].
Jan likes whoever teases
"Jan likes whoever he teases."

d. Jan ufa$_{dat}$ [<u>*komukolwiek$_{dat}$/*kogokolwiek$_{acc}$</u> wpuścił$_{acc}$ do domu].
Jan trusts whoever let to home
"Jan trusts whoever he let into the house."

e. Jan unika$_{gen}$ [<u>kogokolwiek$_{gen/acc}$</u> wczoraj obraził$_{acc}$].
Jan avoids whoever yesterday offended
"Jan avoided whoever he offended yesterday."

Observations:

- German and Polish are mirror images of each other: FR that lack case matching effects in German, show them in Polish, while PGs that allow case mismatches in Polish show strict matching in German.
- Free relatives and parasitic gaps are mirror images of each: if one of the two configurations show case matching effects, the other does not.
- Syncretic forms can repair violations of the case matching condition. Thus, what seems to count for matching are not the abstract Case features but the morphological form.
- *Consequence:* Under the assumption that the morphological form does not count for narrow syntax, the case matching condition cannot be a principle of narrow syntax (see Trommer (2002) for the same conclusion).

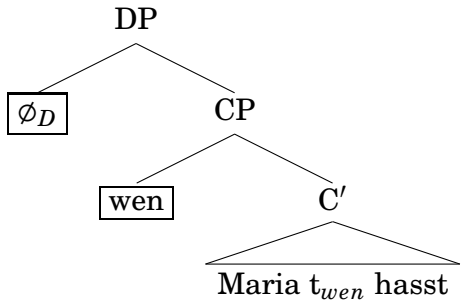
3 Analysis

3.1 Assumptions

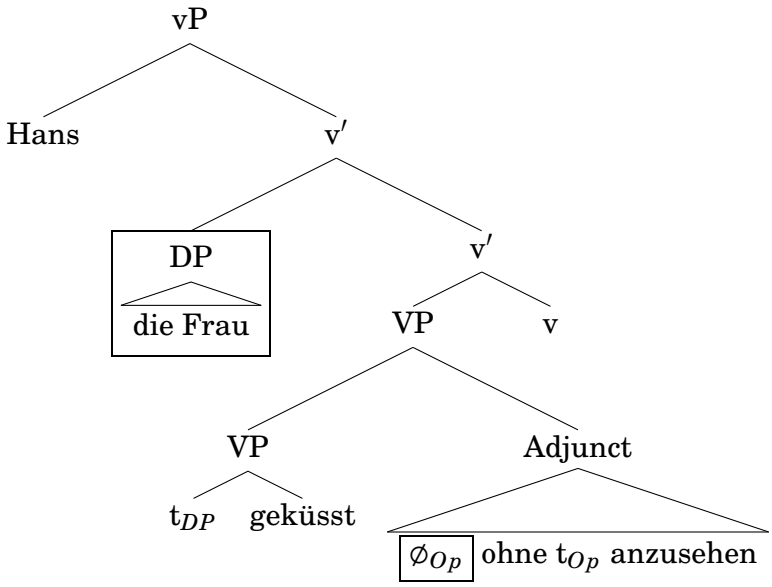
Structure:
Standard structures for free relatives and parasitic gaps: In both cases there is not one item that occupies two case positions, but there is one overt item α and one covert item $\emptyset$ (see Groos and Riemsdijk (1981) among others for FRs, Chomsky (1986) among others for PGs). For concreteness, $\emptyset$ in FR structures is an empty D head, while PG configurations involve an empty operator.

(12) *Structures*

a. *Free relatives*



b. *Parasitic gaps*



Case agreement between α and $\emptyset$:

- The overt item α and $\emptyset$ have a special syntactic bond that can be formalized as an agreement relation (cf. Assmann (2012) for PGs, Grosu (2003); Assmann (2013); Grewendorf and Groat (2013) among others for FRs). Among other features, the agreement relation also affects the case features of the two items.
- Importantly, agreement between α and $\emptyset$ is asymmetric: One of the two acts as the probe.
- Otherwise, case agreement between the overt and the covert item works just like case assignment.

Case assignment

- Case assignment is copying of case features from a case assigning head onto a head that probes for case features. Due to the special agreement relation between α and $\emptyset$ in PG and FR constructions, case features on α and $\emptyset$ can in principle probe twice (once for the case assigning head and once for $\emptyset$ or α respectively).
- All case assignment (and maybe all agreement) is postsyntactic.
  Note: The fact, that the success of case agreement depends on the morphological form and not the abstract Case features strongly suggests that at least part of the case dependency must be post-syntactic.
- Case assignment is only successful if the case feature value of probe and goal do not conflict. By assumption, a conflict cannot arise if one of the two features is still unvalued.
- *Order:* Case probes that are lower in the structure receive their case features first, that is, case feature valuation proceeds bottom-up. If a category probes twice for case features, which happens in FR and PG constructions due to the additional relation (see above), the order is free.
- *Directionality:* There is upward as well as downward agreement for case features (see Zeijlstra (2012) for upward Agree). The only configurational restriction is that the probe and goal are in a c-command relation with the probe c-commanding the goal or vice versa.
  Note: Alternatively, it can be assumed that the case probe always c-commands the goal. Then,

following Bošković (2009), there must be a distinction between the head that triggers agreement and the head that receives values (see also Assmann and Heck (submitted)).

Variation:
Following the Borer-Chomsky-Conjecture (Borer (1984); Chomsky (1995); Baker (2008)), the differences between Polish and German regarding case matching only concern lexical items: Concretely, Polish and German differ in whether the overt element α or the covert element $\emptyset$ triggers case agreement in FRs and PGs.

- In German, case agreement is triggered by α: α[$*$case:_$*$].
- In Polish, case agreement is triggered by $\emptyset$: α[$*$case:_$*$].

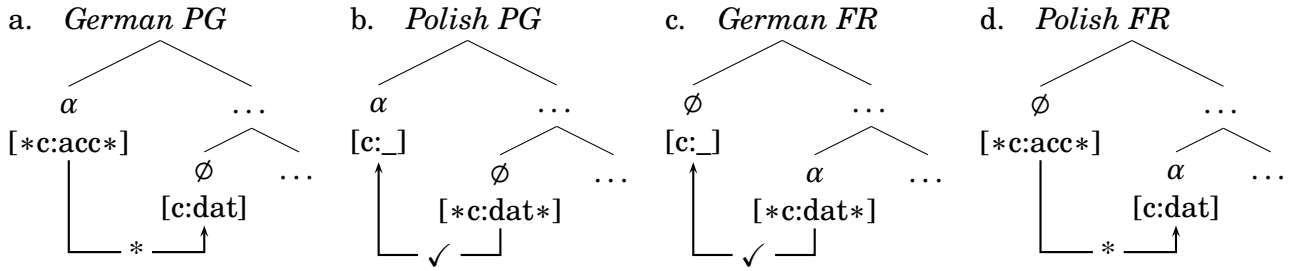
Note:
The double-probe property is depicted by two symbols: "_" stands for "I need a value", while "$*$ $*$" stands for "I want to probe a second time" (see Sternefeld (2006) for the notation $*$ $*$). Thus sometimes case features need to be valued and additionally checked.

This leads to the four possible configurations shown in (14). Each configuration corresponds to one of the four patterns in (3) repeated as (13). (The configurations show the case features at the time when the case feature on $\alpha/\emptyset$ probes a second time.)

(13) *Case mismatches*

	German	*Polish*
Free relatives	✓	*
Parasitic gaps	*	✓

(14)



Idea in a nutshell:

- If the lower of the two elements is the probe, upward case agreement will always result in empty valuation because the higher goal has not received its case features yet. Consequently, the case feature value of the higher goal will not count for matching and mismatches are allowed.
- If the higher of the two elements is the probe, the lower element has already received its case feature value. In this case, both the case feature value of the higher probe and the lower goal will count for matching and strict case matching is required.

3.2 Derivations

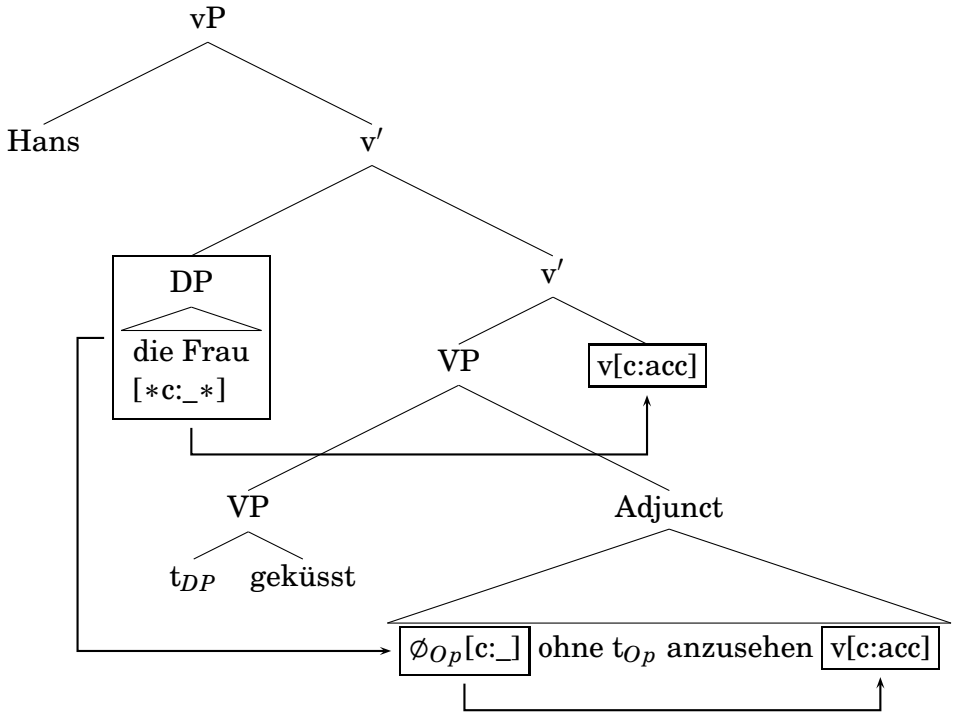
Note:
By assumption, dative case is assigned by an empty applicative head Appl. Alternatively, dative can be assigned by an empty preposition or some other functional head. Nothing hinges on that.

3.2.1 German: probe on α

Parasitic gaps: matching case

(15) weil Hans $\underline{\text{die}_{acc}}$ Frau [ohne anzusehen$_{acc}$] küsste$_{acc}$
because Hans the woman without to.look.at kissed

(16) *Structure*



Due to the bottom-up property of post-syntactic feature valuation, case feature valuation on ∅ must precede valuation of the case features on *die Frau*.

(16) i. ∅[c:_] ⟶ v[c:acc]: ∅[c:acc]

Next, the case feature of α is valued. Since the case feature on α is a double probe, there are two possible orders of case assignment. Both result in case matching.

(16) ii. α[∗c:_∗] ⟶ v[c:acc]: α[∗c:acc∗] ii. α[∗c:_∗] ⟶ ∅[c:acc]: α[∗c:acc∗]
iii. α[∗c:acc∗] ⟶ ∅[c:acc]: α[c:acc] iii. α[∗c:acc∗] ⟶ v[c:acc]: α[c:acc]

Parasitic gaps: no matching case

(17) weil Hans $\underline{\text{*der}_{dat}/\text{*die}_{acc}}$ $\underline{\text{Frau}}$ [anstatt zu helfen$_{dat}$] behinderte$_{acc}$
because Hans the woman instead.of to help hampered

The syntactic derivation of (17) works as in (16). The difference lies in the cases being assigned. In the derivation of (17), ∅ receives dative case in the embedded clause. Case feature valuation of *die Frau* fails because a case conflict on α will arise.

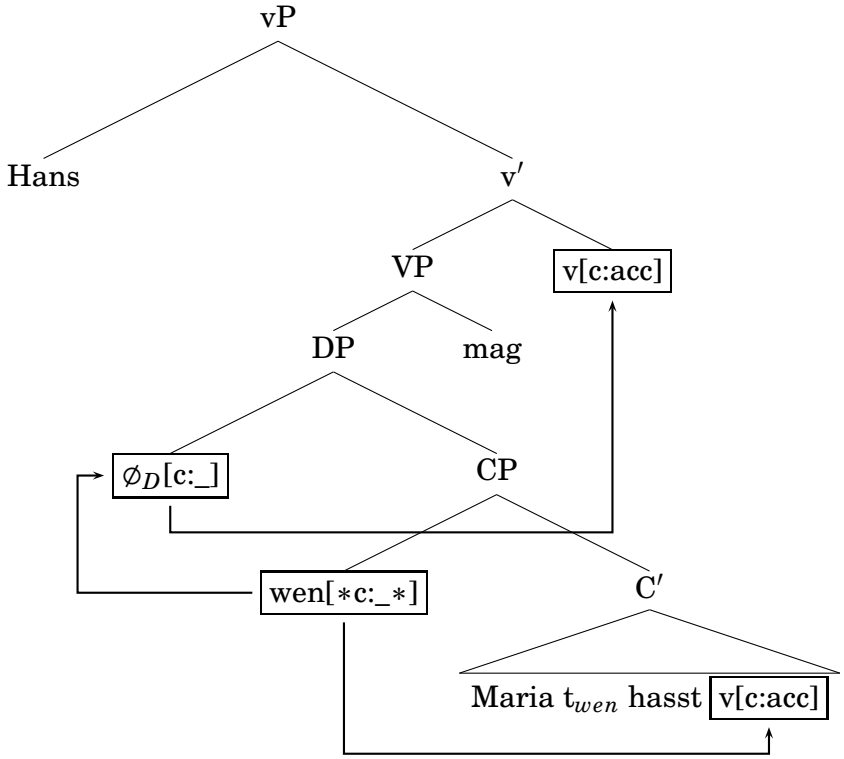
(17)

i.	∅[c:_] ⟶ Appl[c:dat]: ∅[c:dat]	i.	∅[c:_] ⟶ Appl[c:dat]: ∅[c:dat]
ii.	α[∗c:_∗] ⟶ v[c:acc]: α[∗c:acc∗]	ii.	α[∗c:_∗] ⟶ ∅[c:dat]: α[∗c:dat∗]
iii.	α[∗c:acc∗] ⟶ ∅[c:dat]: ↯	iii.	α[∗c:dat∗] ⟶ v[c:acc]: ↯

Free relatives: matching case

(18) Hans mag$_{acc}$, wen$_{acc}$ Maria hasst$_{acc}$.
Hans likes who Maria hates
"Hans likes who Maria hates."

(19) *Structure*



This time, the case feature of the overt item *wen* must be valued first because it is lower in the structure. Since the case feature is a double probe, two orders are possible.

(19)

i.	α[∗c:_∗] ⟶ v[c:acc]: α[∗c:acc∗]	i.	α[∗c:_∗] ⟶ ∅[c:_]: α[c:_]
ii.	α[∗c:acc∗] ⟶ ∅[c:_]: α[c:acc]	ii.	α[c:_] ⟶ v[c:acc]: α[c:acc]

After *wen* has received its case feature value, the case feature on ∅ can be valued.

(19) iii. ∅[c:_] ⟶ v[c:acc]: ∅[c:acc]

Free relatives: no matching case

(20) Hans mag$_{acc}$, *wen$_{acc}$/wem$_{dat}$ Maria vertraut$_{dat}$.
Hans likes who Maria trusts

The syntactic derivation of (20) is similar to (19), but this time the wh-phrase receives dative case in the embedded clause. But since the probe of the additional agreement relation between the wh-phrase and the empty D head is lower than the goal, no case conflict will arise.

(20)

i.	α[∗c:_∗] ⟶ Appl[c:dat]: α[∗c:dat∗]	i.	α[∗c:_∗] ⟶ ∅[c:_]: α[c:_]
ii.	α[∗c:dat∗] ⟶ ∅[c:_]: α[c:dat]	ii.	α[c:_] ⟶ Appl[c:dat]: α[c:dat]
iii.	∅[c:_] ⟶ v[c:acc]: ∅[c:acc]	iii.	∅[c:_] ⟶ v[c:acc]: ∅[c:acc]

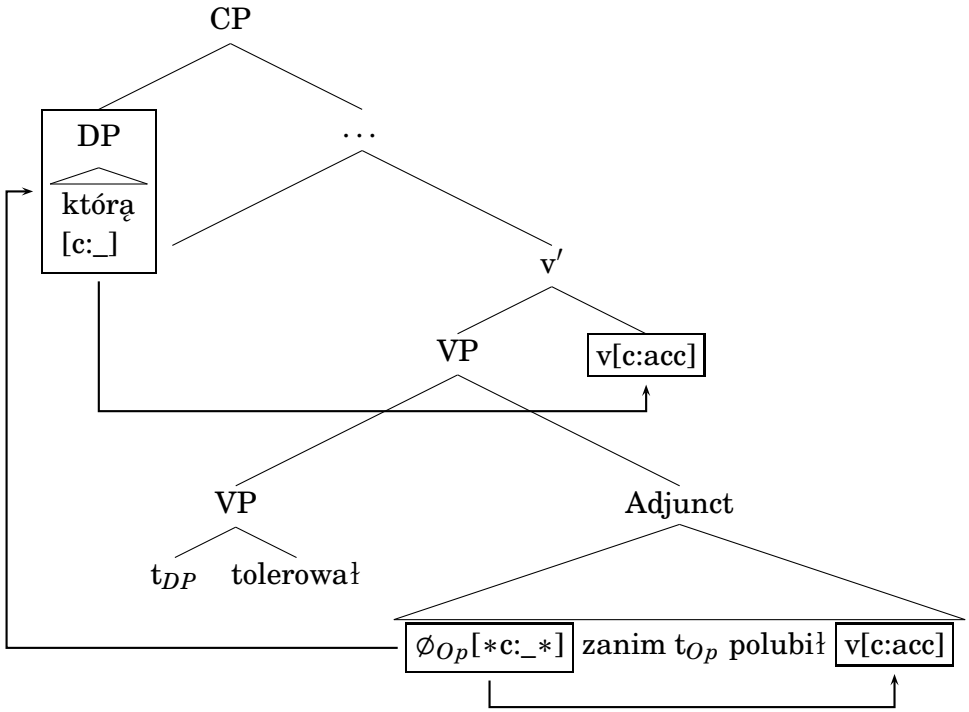
3.2.2 Polish: Probe on ∅

Parasitic gaps: matching case

(21) To jest dziewczyna, <u>którą$_{acc}$</u> Jan tolerował$_{acc}$ zanim polubił$_{acc}$.
this is girl which Jan tolerated before liked.

The syntactic derivation of parasitic gaps in Polish is basically the same as in German. The crucial difference between Polish and German is that ∅ bears the case feature that probes twice. Thus, we have upward agreement in PGs in Polish and no case conflict will arise (similar to free relatives in German).

(22) *Structure*



(22)

i.	∅[∗c:_∗] ⟶ v[c:acc]: ∅[∗c:acc∗]		i.	∅[∗c:_∗] ⟶ α[c:_]: ∅[c:_]	
ii.	∅[∗c:acc∗] ⟶ α[c:_]: ∅[c:acc]		ii.	∅[c:_] ⟶ v[c:acc]: ∅[c:acc]	
iii.	α[c:_] ⟶ v[c:acc]: α[c:acc]		iii.	α[c:_] ⟶ v[c:acc]: α[c:acc]	

Parasitic gaps: no matching case

(23) To jest dziewczyna, <u>którą$_{acc}$/ *której$_{dat}$</u> Jan lubił$_{acc}$ zanim zaczął pomagać$_{dat}$.
this is girl which Jan liked before started help.

The order of case feature valuation is similar to FRs in German. Because the probe of the α-∅ agreement relation is lower than the goal, upward agreement will result in empty valuation. Consequently, no mismatch can arise.

(23)

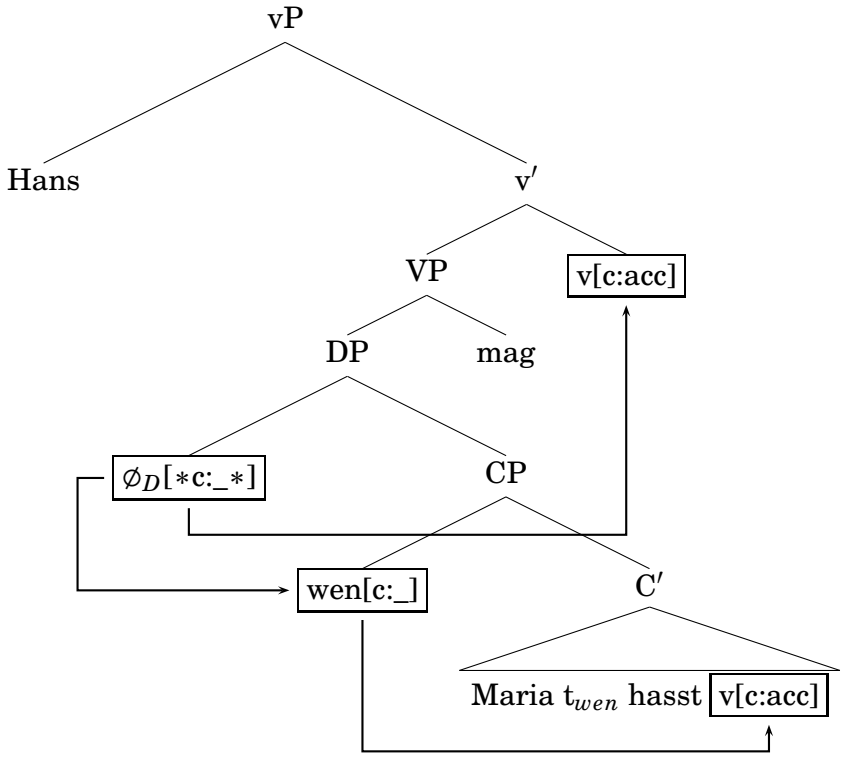
i.	∅[∗c:_∗] ⟶ Appl[c:dat]: ∅[∗c:dat∗]		i.	∅[∗c:_∗] ⟶ α[c:_]: ∅[c:_]	
ii.	∅[∗c:dat∗] ⟶ α[c:_]: ∅[c:dat]		ii.	∅[c:_] ⟶ Appl[c:dat]: ∅[c:dat]	
iii.	α[c:_] ⟶ v[c:acc]: α[c:acc]		iii.	α[c:_] ⟶ v[c:acc]: α[c:acc]	

Free relatives: matching case

(24) Jan lubi$_{acc}$ kogokolwiek$_{acc}$ Maria lubi$_{acc}$.
Jan likes whoever Maria likes

In contrast to German FRs, the probe of the additional case agreement relation is higher than the goal. Thus, both the case value of α and the case value of $\emptyset$ will have to match.

(25) *Structure*



(25)				
	i.	α[c:_] ⟶ v[c:acc]: α[c:acc]	i.	α[c:_] ⟶ v[c:acc]: α[c:acc]
	ii.	$\emptyset$[∗c:_∗] ⟶ α[c:acc]: $\emptyset$[∗c:acc∗]	ii.	$\emptyset$[∗c:_∗] ⟶ v[c:acc]: $\emptyset$[∗c:acc∗]
	iii.	$\emptyset$[∗c:acc∗] ⟶ v[c:acc]: $\emptyset$[c:acc]	iii.	$\emptyset$[∗c:acc∗] ⟶ α[c:acc]: $\emptyset$[c:acc]

Free relatives: no matching case

(26) Jan lubi$_{acc}$ *kogokolwiek$_{acc}$/?*komukolwiek$_{dat}$ dokucza$_{dat}$.
Jan likes whoever teases

The derivation is the same as in (26). This time however, the wh-phrase receives dative case in the embedded clause. This will lead to a case conflict on the double probe $\emptyset$.

(26)				
	i.	α[c:_] ⟶ Appl[c:dat]: α[c:dat]	i.	α[c:_] ⟶ Appl[c:dat]: α[c:dat]
	ii.	$\emptyset$[∗c:_∗] ⟶ α[c:dat]: $\emptyset$[∗c:dat∗]	ii.	$\emptyset$[∗c:_∗] ⟶ v[c:acc]: $\emptyset$[∗c:acc∗]
	iii.	$\emptyset$[∗c:dat∗] ⟶ v[c:acc]: ↯	iii.	$\emptyset$[∗c:acc∗] ⟶ α[c:dat]: ↯

3.3 Opacity

Question:
Some of the derivations above are opaque. At the surface (after step iii.), both α and $\emptyset$ bear case feature values. But only in some of the derivations, conflicting case values on α and $\emptyset$ cause a violation

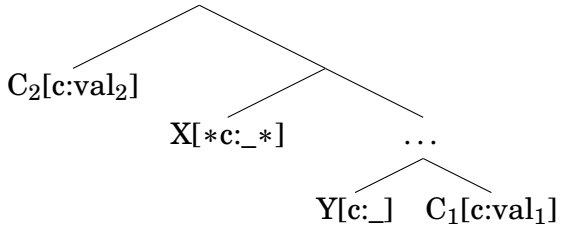
of case matching. Why?

Answer:

- In all derivations there are three case assigment relations that are important:
  1. between the lower element Y and a case assigning head C_1
  2. between the higher element X and another case assigning head C_2
  3. between X and Y
- Case matching arises if the first two case assignment relations result in feature valuation. Then the third case assignment relation will be case feature checking and the two values must be identical. Thus, case feature valuation can bleed final case checking.
- Due to the bottom-up derivation of case feature valuation, Y will receive its case feature value first. If Y is the probe in the case agreement relation between X and Y, we have upward agreement, which will always result in empty feature valuation, thus no final case feature checking, i.e., no case matching, arises. Consequently, there is no bleeding relation. We have counter-bleeding.

Bleeding:

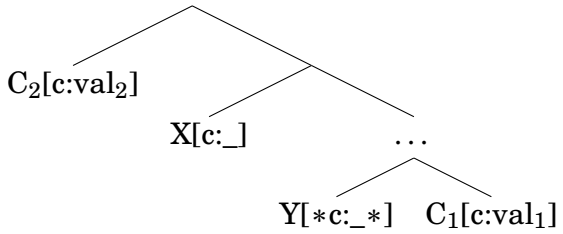
(27)



1. $Y[c:\_] \longrightarrow Y[c:val_1]$
2. $X[*c:\_*] \longrightarrow X[*c:val_2*]$
3. $X[*c:val_2*] \longrightarrow X[c:val_2]$ (*matching required*)

Counter-Bleeding:

(28)



1. $Y[*c:\_*] \longrightarrow Y[*c:val_1*]$
2. $\underline{Y[*c:val_1*] \longrightarrow Y[c:val_1]}$ (*empty valuation*)
3. $X[c:\_] \longrightarrow X[c:val_2]$ (*no matching required*)

Summary:
Upward agreement leads to counter-bleeding! (cf. Georgi (2014))

4 Empirical Questions

4.1 More patterns

Not every speaker of Polish or German allows non-syncretic case mismatches in parasitic gap constructions (Bondaruk (1996)) or free relatives respectively (Riemsdijk (2006)).

Such varieties can be derived under the assumption that the agreement relation between α and $\emptyset$ is symmetric: both α and $\emptyset$ are probes. Intuitively, the strict varieties have both the Polish and the German property.

(29) Hans mag$_{acc}$, *wen$_{acc}$/(*)wem$_{dat}$ Maria vertraut$_{dat}$.
Hans likes who Maria trusts

(30) *Speakers that allow mismatches*

i.	α[∗c:_∗] ⟶ Appl[c:dat]: α[∗c:dat∗]	i.	α[∗c:_∗] ⟶ ∅[c:_]: α[c:_]
ii.	α[∗c:dat∗] ⟶ ∅[c:_]: α[c:dat]	ii.	α[c:_] ⟶ Appl[c:dat]: α[c:dat]
iii.	∅[c:_] ⟶ v[c:acc]: ∅[c:acc]	iii.	∅[c:_] ⟶ v[c:acc]: ∅[c:acc]

(31) *Speakers that don't allow mismatches*

i.	α[∗c:_∗] ⟶ Appl[c:dat]: α[∗c:dat∗]	i.	α[∗c:_∗] ⟶ ∅[∗c:_∗]: α[c:_]
ii.	α[∗c:dat∗] ⟶ ∅[∗c:_∗]: α[c:dat]	ii.	α[c:_] ⟶ Appl[c:dat]: α[c:dat]
iii.	∅[∗c:_∗] ⟶ v[c:acc]: ∅[∗c:acc∗]	iii.	∅[∗c:_∗] ⟶ α[c:dat]: ∅[∗c:dat∗]
iv.	∅[∗c:acc∗] ⟶ α[c:dat]: ↯	iv.	∅[∗c:dat∗] ⟶ v[c:acc]: ↯

(32) To jest dziewczyna, <u>którą$_{acc}$/ *której$_{dat}$</u> Jan lubił$_{acc}$ zanim zaczął pomagać$_{dat}$.
this is girl which Jan liked before started help.

(33) *Speakers that allow mismatch*

i.	∅[∗c:_∗] ⟶ Appl[c:dat]: ∅[∗c:dat∗]	i.	∅[∗c:_∗] ⟶ α[c:_]: ∅[c:_]
ii.	∅[∗c:dat∗] ⟶ α[c:_]: ∅[c:dat]	ii.	∅[c:_] ⟶ Appl[c:dat]: ∅[c:dat]
iii.	α[c:_] ⟶ v[c:acc]: α[c:acc]	iii.	α[c:_] ⟶ v[c:acc]: α[c:acc]

(34) *Speakers that don't allow mismatch*

i.	∅[∗c:_∗] ⟶ Appl[c:dat]: ∅[∗c:dat∗]	i.	∅[∗c:_∗] ⟶ α[∗c:_∗]: ∅[c:_]
ii.	∅[∗c:dat∗] ⟶ α[∗c:_∗]: ∅[c:dat]	ii.	∅[c:_] ⟶ Appl[c:dat]: ∅[c:dat]
iii.	α[∗c:_∗] ⟶ v[c:acc]: α[∗c:acc∗]	iii.	α[∗c:_∗] ⟶ ∅[c:dat]: α[∗c:dat∗]
iv.	α[∗c:acc∗] ⟶ ∅[c:dat]: ↯	iv.	α[∗c:dat∗] ⟶ v[c:acc]: ↯

Assuming that the agreement relation between α and ∅ is an essential property of FR and PG constructions, no language can be derived in which both constructions allow case mismatches.
In fact, such a distribution of case matching effects has not been reported in the literature.

4.2 Syncretisms

In all the data above, syncretic forms could remedy a violation of case matching. Thus, it seems that it is the morphological form and not the abstract case feature that is crucial for the matching effects.

Assumptions:
Syncretic forms result from special morphological rules. For the sake of concreteness, I assume that syncretisms are due to language-specific *feature changing syncretism rules* (cf. Noyer (1992, 129)). Alternatively, impoverishment rules can be used.

(35) a. To jest dziewczyna, <u>której$_{gen/dat}$</u> Jan się bał$_{gen}$ zanim zaczął pomagać$_{dat}$.
this is girl which Jan REFL fear before started help.
'This is the girl Jan was afraid of before he started to help.'
b. Jan lubi$_{acc}$ <u>kogokolwiek$_{acc/gen}$</u> Maria nienawidzi$_{gen}$.
Jan likes whoever Maria hates
'Jan likes whoever Maria hates.'

(36) *Syncretism rules in Polish*
a. [acc] → [gen]/[anim]
b. [dat] → [gen]/[rel], [fem]

Furthermore the condition under which agreement fails must be refined: agreement can apply always and potentially add additional values to features. Only if a mismatch on the probe cannot be circum-

vented by a syncretism rule, the derivation fails. That is, the syncretism rules apply early before the final case assignment operation applies (cf. Trommer (2002); Keine (2010)).

(37) *Derivation of (35-b)*

i.	α[c:_] ⟶ Appl[c:gen]: α[c:gen]	i.	α[c:_] ⟶ Appl[c:gen]: α[c:gen]
ii.	$\emptyset$[∗c:_∗] ⟶ α[c:gen]: $\emptyset$[∗c:gen∗]	ii.	$\emptyset$[∗c:_∗] ⟶ v[c:acc]: $\emptyset$[∗c:acc∗] *[acc] → [gen]/[anim]: $\emptyset$[∗c:gen∗]*
iii.	$\emptyset$[∗c:gen∗] ⟶ v[c:acc]: $\emptyset$[∗c:gen,acc∗] *[acc] → [gen]/[anim]: $\emptyset$[∗c:gen,gen∗]* = $\emptyset$[∗c:gen∗]	iii.	$\emptyset$[∗c:gen∗] ⟶ α[c:gen]: $\emptyset$[c:gen]

Note:
By assumption, $\emptyset$ and α agree in other features such as animacy as well. Therefore, the context for feature changing is also given on $\emptyset$.

4.3 Case Hierarchy Effects in German

Not all case mismatches in German free relatives are tolerable. As has been observed in the literature, the pattern seems to involve the case hierarchy in (38) (Pittner (1991, 1995); Vogel (2001); Grosu (2003)). The condition is given in (39).

(38) *Case Hierarchy*
Nom > Acc > Dat/Gen

(39) *Matching Condition*
If the case assigned by the matrix clause is higher on the case hierarchy than the case assigned within the FR, the wh-phrase may bear the case of the FR, violating matching.

(40) a. Hans mag$_{acc}$, *wen$_{acc}$/wem$_{dat}$ Maria vertraut$_{dat}$.
Hans likes who Maria trusts
b. Hans vertraut$_{dat}$, *wen$_{acc}$/*wem$_{dat}$ Maria mag$_{acc}$.
Hans likes who Maria trusts

The case hierarchy effects do not follow from the present analysis without further ado. In order to solve the problem, the following assumptions can be added:

- In Assmann (2013) the problem was solved by decomposing case features so that the hierarchy is implemented as a subset relation, e.g. as in (41) (cf. Caha (2009)).

  (41) *Case Hierarchy*
  {nom} ⊂ {nom,acc} ⊂ {nom, acc, dat}/{nom, acc, gen}

- Furthermore, the symmetry of case assignment relations must be subject to parametrization: In German the relation α – $\emptyset$ is symmetric and the relation DP – case assigner is asymmetric, while in Polish it is reversed.
  Note: This gives rise to more patterns: languages with strict case matching in both constructions always have symmetric relations, while languages for which lack symmetric relations entirely should allow case mismatches without case hierarchy effects.

- Case assignment between a case assigning head and a DP fails if both probe and goal bear case features and if a case feature on the goal does not find a match on the probe (goal ⊆ probe).

- Case assignment between α and $\emptyset$, i.e. between two DPs, fails if both bear cases and the cases are not identical (goal = probe).

- The order of operations must be more restricted. A double probe first receives the case features of the closest goal.

German

(42) *FR: ∅[acc], α[dat]*

ii. α[∗c:_∗] ⟶ ∅[∗c:_∗]: α[c:_]
ii. α[c:_] ⟶ Appl[c:{dat,acc,nom}]: α[c:{dat,acc,nom}]
---
iii. ∅[∗c:_∗] ⟶ α[c:{dat,acc,nom}]: ∅[∗c:{dat,acc,nom}∗]
iv. ∅[∗c:{dat,acc,nom}∗] ⟶ v[c:{acc,nom}]: ∅[c:{dat,acc,nom}] (v ⊆ ∅)

Importantly, the closest goal of the probe on ∅ is α. Thus, agreement between ∅ and α must precede agreement between ∅ and matrix v. The configuration is successful.

(43) *FR: ∅[dat], α[acc]*

i. α[∗c:_∗] ⟶ ∅[∗c:_∗]: α[c:_]
ii. α[c:_] ⟶ v[c:{acc,nom}]: α[c:{acc,nom}]
---
iii. ∅[∗c:_∗] ⟶ α[c:{acc,nom}]: ∅[∗c:{acc,nom}∗]
iv. ∅[∗c:{acc,nom}∗] ⟶ Appl[c:{dat,acc,nom}]: ↯ (Appl $\not\subseteq$ ∅)

(44) *PG: ∅[dat], α[acc]*

i. ∅[∗c:_∗] ⟶ Appl[c:{dat,acc,nom}]: ∅[∗c:{dat,acc,nom}∗]
ii. ∅[∗c:{dat,acc,nom}∗] ⟶ α[∗c:_∗]: ∅[c:{dat,acc,nom}]
---
iii. α[∗c:_∗] ⟶ v[c:{acc,nom}]: α[∗c:{acc,nom}∗]
iv. α[∗c:{acc,nom}∗] ⟶ ∅[c:{dat,acc,nom}]: ↯ ($\alpha \neq \emptyset$)

(45) *PG: ∅[acc], α[dat]*

i. ∅[∗c:_∗] ⟶ v[c:{acc,nom}]: ∅[∗c:{acc,nom}∗]
ii. ∅[∗c:{acc,nom}∗] ⟶ α[∗c:_∗]: ∅[c:{acc,nom}]
---
iii. α[∗c:_∗] ⟶ Appl[c:{dat,acc,nom}]: α[∗c:{dat,acc,nom}∗]
iv. α[∗c:{dat,acc,nom}∗] ⟶ ∅[c:{acc,nom}]: ↯ ($\alpha \neq \emptyset$)

By assumption, the dative assigning head Appl is merged outside VP (cf. McFadden (2004)). Then Appl is (just like v) closer to α than ∅.

Polish

(46) *FRs: α[dat], ∅[acc]*

i. Appl[∗c:{dat,acc,nom}∗] ⟶ α[∗c:_∗]: Appl[c:{dat,acc,nom}]
---
ii. α[c:_] ⟶ Appl[c:{dat,acc,nom}]: α[c:{dat,acc,nom}]
---
iii. ∅[∗c:_∗] ⟶ α[c:{dat,acc,nom}]: ∅[∗c:{dat,acc,nom}∗]
iv. ∅[∗c:{dat,acc,nom}∗] ⟶ v[c:{acc,nom}]: ∅[c:{dat,acc,nom}]
---
v. v[∗c:{acc,nom}∗] ⟶ ∅[c:dat,acc,nom]: ↯ (∅ $\not\subseteq$ v)

(47) *FRs: α[acc], ∅[dat]*

i. v[∗c:{acc,nom}∗] ⟶ α[∗c:_∗]: v[c:{acc,nom}]
---
ii. α[c:_] ⟶ v[c:{acc,nom}]: α[c:{acc,nom}]
---
iii. ∅[∗c:_∗] ⟶ α[c:{acc,nom}]: ∅[∗c:{acc,nom}∗]
iv. ∅[∗c:{acc,nom}∗] ⟶ Appl[c:{dat,acc,nom}]: ↯ (Appl $\not\subseteq$ ∅)

(48) *PGs: ∅[dat], α[acc]*

i.	Appl[∗c:{dat,acc,nom}∗] ⟶ ∅[∗c:_∗]: Appl[c:{dat,acc,nom}]
ii.	∅[∗c:_∗] ⟶ Appl[c:{dat,acc,nom}]: ∅[∗c:{dat,acc,nom}∗]
iii.	∅[∗c:{dat,acc,nom}∗] ⟶ α[∗c:_∗]: ∅[c:{dat,acc,nom}]
iv.	v[∗c:{acc,nom}∗] ⟶ α[c:_]: v[c:{acc,nom}]
v.	α[c:_] ⟶ v[c:{acc,nom}]: α[c:{acc,nom}]

(49) *PGs: ∅[acc], α[dat]*

i.	v[∗c:{acc,nom}∗] ⟶ ∅[∗c:_∗]: v[c:{acc,nom}]
ii.	∅[∗c:_∗] ⟶ v[c:{acc,nom}]: ∅[∗c:{acc,nom}∗]
iii.	∅[∗c:{acc,nom}∗] ⟶ α[∗c:_∗]: ∅[c:{acc,nom}]
iv.	Appl[∗c:{dat,acc,nom}∗] ⟶ α[c:_]: Appl[c:{dat,acc,nom}]
v.	α[c:_] ⟶ Appl[c:{dat,acc,nom}]: α[c:{dat,acc,nom}]

5 Alternatives

Question:
Are there any alternatives to the present account?

The number of possibilities to analyse structures, where one item seems to be a dependent of two verbs, is limited. In principle there are three strategies:

1. *Agreement approaches (the present account):*
   Postulate an extra empty category and let the empty and the overt category communicate in some way – usually, some form of agreement (Chomsky (1982); Engdahl (1983); Chomsky (1986); Cinque (1990); Nissenbaum (2000); Kuroda (1968); Bresnan and Grimshaw (1978); Groos and Riemsdijk (1981); Hirschbühler and Rivero (1981); Harbert (1983); Suñer (1984); Grosu and Landman (1998); Grosu (2003); Caponigro (2002); Gračanin-Yuksek (2008)).

2. *Identity approaches:*
   Let the overt category be the only category and model the additional syntactic dependendency differently (multidominance accounts à la Riemsdijk (2006); Kasai (2008); Citko (2005, 2013) or movement accounts (Huybregts and van Riemsdijk (1985); Bennis and Hoekstra (1985); Williams (1990); Nunes (2004); Rooryck (1994); Caponigro (2003); Donati and Cecchetto (2011); Ott (2011))).

3. *Reanalysis:*
   Treat FRs and PGs differently in different languages. In some languages, FRs/PGs involve empty categories and in some, they don't.

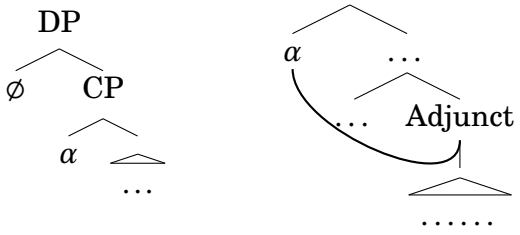
Question:
The present analysis of case matching effects is an example for how agreement approaches can deal with the pattern discussed in section 2. What about the alternatives?

5.1 Reanalysis

Strict matching is due to identity: there is only one element that has to satisfy the case requirements of two verbs. The absence of matching effects arises if a second, empty, category is involved.

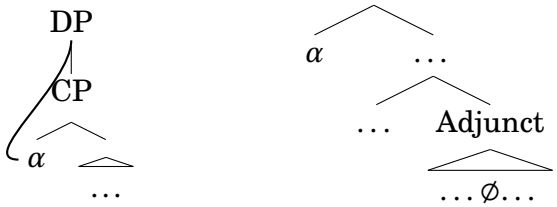
(50) *German*

a. *Free Relatives* b. *Parasitic Gaps*



(51) *Polish*

a. *Free Relatives* b. *Parasitic Gaps*



The solution is very simple but requires additional evidence that the two constructions really have different derivations in different languages.

As for Polish and German, there are no major differences concerning parasitic gaps (see Bondaruk (1996) on PGs in Polish) and free relatives:

(52) *Parasitic Gaps*

	German	*Polish*
island sensitivity	✓	✓
categorial restrictions	✓	✓
ban against licensing in-situ	✓	?
ban on A-movement licensing	✓	✓
tensed environments	*	✓

(53) *Free Relatives*

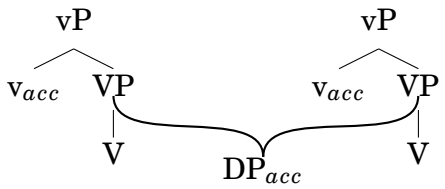
	German	*Polish*
lack of overt nominal head	✓	✓
wh-phrase instead of relative pronoun	✓	✓
clause with gap	✓	✓
replacebable with truth-conditionally equivalent DP or PP	✓	✓

5.2 Citko (2013)

In Citko (2013), an analysis of variation is presented that builds on multidominance. However, only one part of the variation, namely the variation within one language, can be derived.

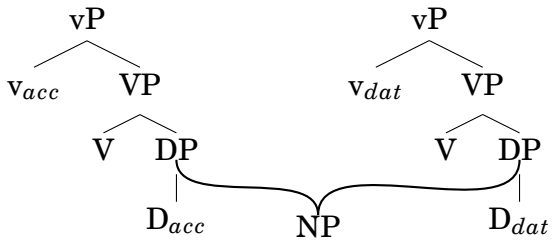
Strict matching occurs when a DP is subject to multidominance: The case feature that is located on D is shared between two verbs. Thus, it has to match the requirements of both verbs.

(54)



Mismatching is due to multidominance of an NP. The NP is dominated by two DPs with one case feature each. Consequently, the two case features can receive two different values and the absence of matching effects is predicted.

(55)



In Polish parasitic gaps structures, only an NP is shared between two clauses, while in free relative contexts, the entire DP with only one case feature is shared.

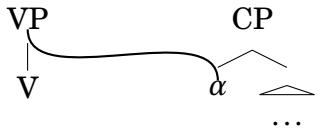
The analysis faces problems with cross-linguistic variation: German PGs and FRs must be different from Polish PGs and FRs: In German, PGs requires sharing of a DP and FRs require sharing of an NP. This resembles a reanalysis strategy which cannot be maintained due to lack of independent evidence.

A further problem concerns case concord inside the DP. Morphologically, case is also realized on nouns. Thus, NPs must also bear a case feature. If the NP is shared between two D heads with conflicting case features, the single case feature on the NP cannot meet the requirements of both D heads, that is, the violation of matching is expected to occur on the NP level.

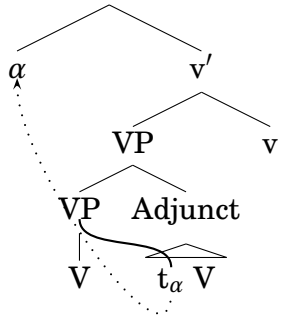
5.3 Identity: Multidominance

In both FRs and PGs, the overt category is shared between two verbs. Thus it is dependent on the case requirements of both verbs.

(56) *Free Relatives*



(57) *Parasitic Gaps*

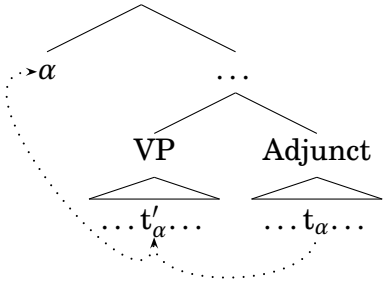


Grafting approaches have a problem explaining variation. The cross-linguistic variation can be handled by assuming that in one language a matching condition holds while in the other language, there is no matching condition. However, since abstractly, FRs and PGs have the same derivation, both construction in one language are predicted to either show case matching effects or not. The only way out would be that the matching condition is construction-specific which predicts that there should be languages which do not show matching effects in any of the two constructions, contrary to what is reported in the literature.

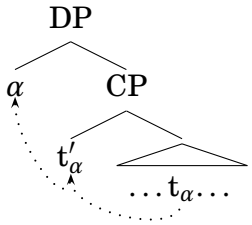
5.4 Identity: movement

The overt category is merged in the embedded clause, where it receives case. It then moves to the respective argument position in the superordinate clause, before it reaches its target position. In the higher clause the case features received in the embedded have to match the new case requirements.

(58) *Parasitic Gaps*



(59) *Free Relatives*



The account faces the same problems as the multidominance account when it comes to the matching effects because the abstract derivation of the two constructions is the same.

6 Conclusion

The pattern:
Polish and German are mirror images of each other when it comes to case matching effects with free relatives and parasitic gaps: Polish free relatives and German parasitic gaps require strict matching, while German free relatives and Polish parasitic gaps allow case mismatches.

Analysis:
The present account essentially builds on the order of post-syntactic agreement operations and the free directionality of agreement. Both in FRs and PGs, there is an overt item α and a covert item $\emptyset$ which have to agree in case features additionally to their normal case agreement relation with case assigning heads. If agreement between α and $\emptyset$ is upward agreement, it applies early and will not have an effect on other case assignment relations. If it applies late, it can potentially bleed other case assignment relations.

Conclusion:

- It was shown that this intricate pattern of case matching effects can be analyzed without parametrizing principles of narrow syntax. All variation was attributable to differences between the features of lexical items and post-syntactic morphological operations. This kind of variation is in line with the basic tenet of minimalism to keep syntax parameter-free.
- The analysis is an argument for a derivational view on post-syntactic operations since certain output representations are opaque. The opacity was resolved by making use of ordering of operations.

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