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Ellipsis in the syntax–PF interface

A German determiner sharing case study

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1 The Data

- Structures in which a **determiner or quantifier** is **omitted** from the second conjunct in a **gapping** construction have been known as **determiner sharing** structures (DS) since McCawley (1993).
- possible in subject position (1-a), object position (1-b), matrix and embedded clauses (1-c)

(1) a. **Few** dogs eat Whiskas or ~~few~~ cats (*eat) Alpo. (Johnson 2000)

b. Er hat **jedem** Lehrer ein Buch gegeben und ~~jedem~~ Schüler ein Heft
he has every.DAT teacher.DAT a book given and every.DAT student.DAT a folder
~~gegeben.~~
given
"He has given every teacher a book and every student a folder."

c. dass **kein** Mädchen Geige (spielt) und (*dass) ~~kein~~ Junge Klavier (spielt)
that no girl violin plays and that no boy piano plays
"... that no girl plays the violin and no boy plays the piano"

- In this talk, I will focus on determiner sharing in subject position.

Generalizations:

1. **DS is dependent on Gapping** (McCawley (1993); Johnson (2000); Lin (2002) *et seq*). If the verb in the second (and following) conjuncts is not gapped, an interpretation of a shared quantifier is not available.

(2) **Alle** Mädchen spielen Klavier und ＿ Jungen spielen Geige.
all girls play piano and boys play violin
only interpretation: *"All girls play the piano and boys in general play the violin."*

2. **The shared DET must be initial in its conjunct**. Any material overtly intervening between the coordinator and the DET makes DS impossible.

(3) *?[Ein Teleskop] haben **viele** Kollegen Peter geschenkt und **[einen Römertopf]**
a telescope.ACC have many colleagues.NOM P given and a clay.pot
~~haben viele~~ Freunde ~~Peter geschenkt~~
have many friends.NOM P given
intended: *"Many colleagues have given a telescope to Peter and many friends have given him a clay pot."*

3. **Not all DETs may be shared**. There is a lot of cross- and intra-linguistic variation. The only cross-linguistically robust generalization[1] seems to be that (bare) **cardinal numbers** and the **indefinite article** may never be shared.

(4)   a.   possible in German DS: *alle* 'all', *einige* 'some', *wenige* 'few', *viele* 'many', *kein* 'no', definite article, ordinal numbers, etc.
      b.   impossible in German DS: indefinite article, cardinal numbers, possessive pronouns, demonstratives

4. **DS can never skip elements**. A prenominal modifier can only be deleted a) if it is the first one (generalization 2) or b) if it's left/higher neighbor has been deleted.

(5)   **Jeder zweite** Schüler leidet unter Stress und **jeder** ~~zweite~~ Lehrer unter Lärm.
      every second student suffers under stress and every second teacher under noise
      "Every other student suffers from stress and every other teacher suffers from noise."
      "Every other student suffers from stress and every teacher suffers from noise."

2   PF vs. syntax proper: Which module produces DS?

- What makes this a difficult question is that (linearly) **leftmost** also means (structurally) **higher**. It is not immediately clear if the rules of DS refer to linear or hierarchical order.
- Initially, a linear/PF analysis seems to be simplest:
  - The dependency on gapping could be captured straightforwardly by extrinsic ordering between modules: a syntactic ellipsis process (gapping) **feeds** a PF ellipsis operation (determiner sharing)
  - **basic idea of PF analysis**: Gapping obligatorily involves a small conjuncts, (6). The left edge of the second vP-conjunct is a marked position: only prosodically strong elements can surface there. Weak elements such as DETs are deleted.

    (6) $[\ldots \text{subject}_1 \ldots [_{vP} \ldots t_{subj1} \ldots] \text{ and } [_{vP} \ldots \text{subject}_2 \ldots]]$

- However, as we will see in this section, the evidence points more towards a more intricate **syntactic** analysis.

2.1   Arguments for a PF-analysis

1. The deleted material in DS doesn't have to form a **syntactic constituent**, (7). Syntactic rules cannot straightforwardly refer to non-constituents.

(7)   **Jede** alte Katze mag ein warmes Bett und ~~jede~~   ~~alte~~ Schildkröte ~~mag~~ einen Platz in der Sonne.
      every old cat   likes a warm   bed and every old turtle   likes a   place in the sun

2. DS doesn't obey **syntactic constraints** on movement.
   - One popular analysis of ellipsis is the so called **move-and-delete** approach (exemplified in (8) with non-constituent ellipsis by Sailor & Thoms (2014)):
   ⇒ evacuation movement + subsequent deletion of the evacuated constituent.

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[1]Based on a small sample of 5 languages: German, English (Lin 2000; Johnson 2000; McAdams 2012), Spanish (Arregi & Centeno 2005), Korean(Kim 2011; Citko 2006, Hyunjung Lee, p.c.), and Dutch dialects (Ackema & Szendrői 2002).

(8)   Mary talks to Beth on Friday and ~~Mary talks to~~ Charles on Tuesday.

FocP
- FocP
  - Mary talks to Beth on Friday   and   FocP
    - Charles_i
    - on Tuesday_k
      - Foc^0 vP
        - Mary talks to t_i t_k
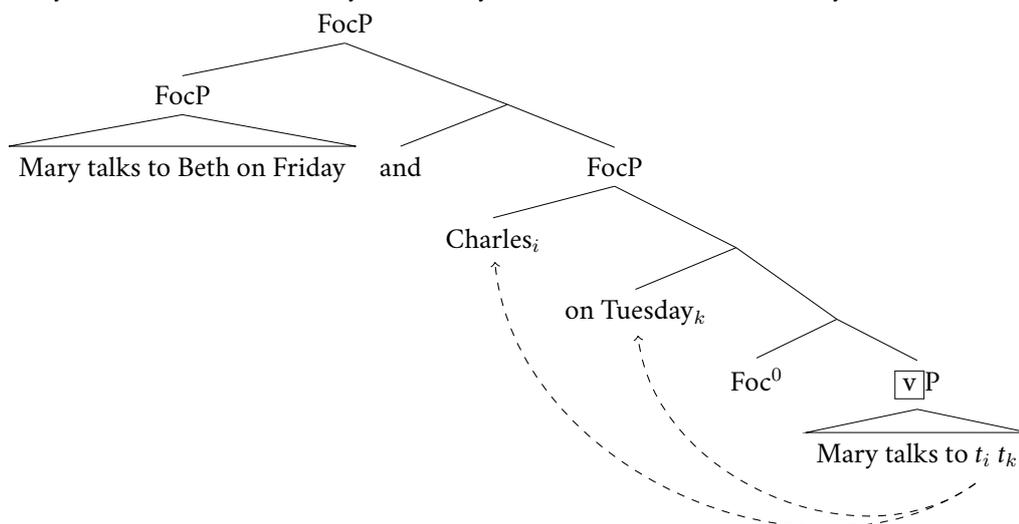
- Evidence for this move-and-delete approach comes from (9), where NCE is ungrammatical if one of the remnants is contained in an island (like a possessive DP).

  (9)   a.   [John wrote everyone's favorite song about football in 2001] and [~~John wrote~~ everyone's favorite song about basketball in 2012].
        b. *?John wrote everyone's favorite song about football in 2001 and []about basketball in 2012.   (Sailor and Thoms 2014:363)

⇒ DS is **not sensitive to island violations**. Even if the remnant is embedded in a subject island, ellipsis in the second conjunct is grammatical, (10).

  (10)   **Solche** Katzen gehen baden   und ~~solche~~ Hunde ~~gehen~~ auf die Jagd.
         such   cats   go   bathing and such   dogs   go   on the hunt

⇒ This suggests that no movement is involved in the derivation of DS.
- This also means that, if move-and-delete is the right analysis for gapping, it is not the right analysis for DS. Thus, DS-constructions are not non-constituent-ellipses, but involve **two distinct ellipsis processes**: gapping and DS.

3. If the **left edge** of the conjunct is **occupied** by a prosodically heavy constituent (like an XP, not a weak element like a DET), DS becomes impossible, (11) (see also generalization 2).

  (11)   *[Die Pizza]   haben **wenige** Jungs   bestellt, und [die Pasta],   ~~wenige~~ Mädchen.
         the pizza.ACC have few   boys.NOM ordered and the pasta.ACC few   girls.NOM
         intended: *"Few boys have ordered pizza and few girls have ordered pasta."*

2.2   Arguments for a syntactic analysis

1. Evidence *against* a PF-analysis: it makes the wrong prediction in cases like (12), where **adjuncts** are involved:

  (12)   *[**Jeden** Morgen] putzen sie   die Küche   und [~~jeden~~ Abend]   das Bad.
         every   morning clean   they the kitchen and every   evening the bathroom
         intended: *"They clean the kitchen every morning and they clean the bathroom every evening."*

- In an analysis where a phonologically weak element is deleted at the left edge of a certain prosodic unit, grammatical function should not play a role. However, if that weak element is part of an adjunct, deletion is impossible.
2. There is evidence that conjuncts in German are larger than vPs. Gapping in German is standardly

analyzed as involving *large conjuncts*/ high coordination.

(13) *No wide scope of negation* (Repp (2009))

?*Max hat den Kuchenteller **nicht** abgewaschen und Paul die Salatschüssel.
Max   has the cake.plate   NEG   washed   and Paul the salad.bowl

(14) *No cross-conjunct binding*

?*Jede₁ Studentin wählt SPD und ihr₁ Betreuer ~~wählt~~ CDU.
every student   votes SPD and her advisor   votes CDU

(15) *YES object fronting*

Ich weiß nicht [**was**   Peter Ute   zum Geburtstag schenkt] und [*(**was**)   sie
I   know NEG what.ACC P.NOM U.DAT to   birthday   give   and what.ACC she.NOM
ihm   ~~zum Geburtstag schenkt~~]
him.DAT to   birthday   give

Detour: Gapping

- analyses of gapping in German: Winkler (2005); Reich (2007); Repp (2009); Forman-Gejrot (2016) a.o.
- I follow Aelbrecht (2010) in assuming that gapping is syntactically licensed.
- In contrast to DS (as discussed in 2.1), Gapping *is* sensitive to the restrictions of movement, see e.g. Neijt (1979); Yoshida (2005) .
- Preview of the analysis: It is triggered by an **[E]-feature** (Merchant 2001, 2004; Aelbrecht 2010) on Fin^0, inducing the deletion of Fin^0's complement (with preceding evacuation movement).

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3. The ellipsis mechanism in DS exhibits the **same properties as Agree**. More specifically, the relationship between verbal gapping and DS is sensitive to the restrictions of Agree. This suggests that DS is syntactically licensed via Agree with the gapping-inducing head (Fin).

   - **Phase** condition: The elided determiner and the gapped verb have to be **phase mates**. Assuming that gapping licenses DS, gapping in the matrix clause cannot license DS in the embedded clause because of the intervening phase boundary.

     (16)   [CP Kein Mädchen sollte   Klavier spielen,] findet SIE, und [CP *(kein) Junge sollte   Geige
            no   girl   should piano play   thinks she and   no   boy   should violin
            spielen], ~~findet~~ ER.
            play   thinks he

   - **C-command** condition: The operation that produces DS obeys **c-command**. Gapping in an embedded sentence should be too low to license DS in the matrix clause.

     (17)   *[CP **Jede** Professorin glaubt   dass die Regierung   die Wirtschaft   beeinflusst]
            every professor   believes that the government.NOM the economy.ACC influences
            und [CP ~~jede~~ Studentin denkt (*dass) der Markt   die Regierung   ~~beeinflusst~~]
            and   every student   thinks that   the market.NOM the government.ACC influences
            intended: *"Every professor believes that the government influences the economy and every student believes that the market influences the government."*

   - This is tricky to test. (17) also involves a phase boundary. Unfortunately, gapping can independently only apply to finite verbs, and embedding of finite verbs always involves a phase boundary.
   - **Intervention** condition: The IO c-commands the DO, intervening in the relation between the gapping-triggering Fin^0 and the DS-exhibiting DO.

     (18)   *Ich habe meiner Mutter **jede** Blume gezeigt und meinem Vater ~~jede~~ Krähe.
   I   have my.DAT mother every flower shown and my.DAT father every crow

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2.3 Interim summary

- The properties of DS-constructions, which initially look like restrictions on the linear structure and the overt realization, actually make reference to the **hierarchical structure**.

3 Analysis

- In a nutshell: DS is a type of [E]-deletion (Merchant 2001, 2004), licensed by Agree with gapping-[E] (Aelbrecht 2010).
  - A syntactic head carries a feature [E] that, under Agree with a higher, licensing head, instructs post-syntax to leave that head's complement unpronounced, (19).
  - Axiom: [E] is phase-bound, i.e., it can only target elements within the same phase as its host head

(19) *Ellipsis and licensing*
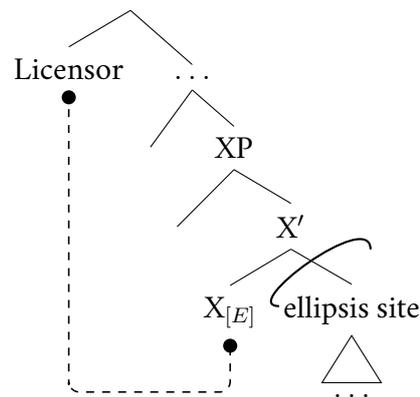
- [E] is classically used in analyses of sluicing, fragment answers (Merchant 2004).
- I propose that there is a **different kind of [E]** at work in determiner sharing structures.
- DS-[E] differs from sluicing/fragment-[E] :
  - Sluicing-[E] triggers non-pronunciation of the element that is *closest* in its host's c-command domain, i.e., the host's complement
  - DS-[E] is the complete opposite: it triggers non-pronunciation of the element that c-commands the host (N^0) and is *furthest* away (Spec,DP, D^0, ...) inside the same phase
  - In this sense, DS shows an **anti-locality** effect.
- DS-[E] is defined in (20) (in a notation that combines Merchant's and Aelbrecht's). It is hosted on N^0, has to be licensed by Agreeing with Fin^0, and instructs PF to leave a [–c-command, –local] element unpronounced.
- [E]-features are generally optional.

(20) *DS-[E]*
  a. CAT: [E]
  b. INF: $[u\text{Fin}]$
  c. SEL: $[u\text{N*}]$
  d. PHON: $\varphi_{X_{[-\text{c-com},-\text{loc}]}} \rightarrow \emptyset/E$

(21) *Step 1: Determiner sharing*
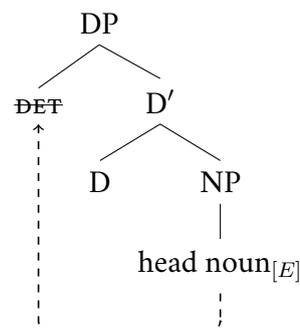
- DS must be licensed by gapping (generalization 1)
- DS-[E] acts as a derivational time bomb: if it can't agree with an [E] on Fin, the structure becomes ungrammatical
- Gapping = deletion of CP[2]
- remnants evacuate the ellipsis site and move to Top/Foc projections, (22)

(22) *Step 2: Licensing of DS by gapping-[E]*
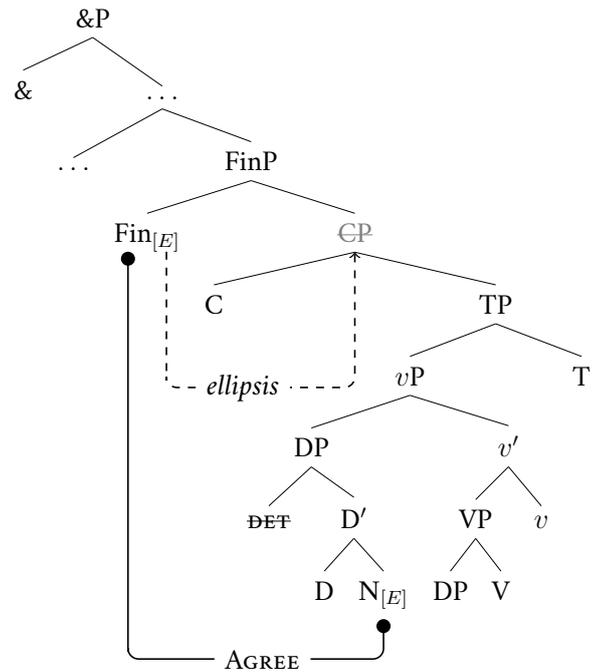
(23) *Step 3: Gapping and evacuation movement of the remnants*
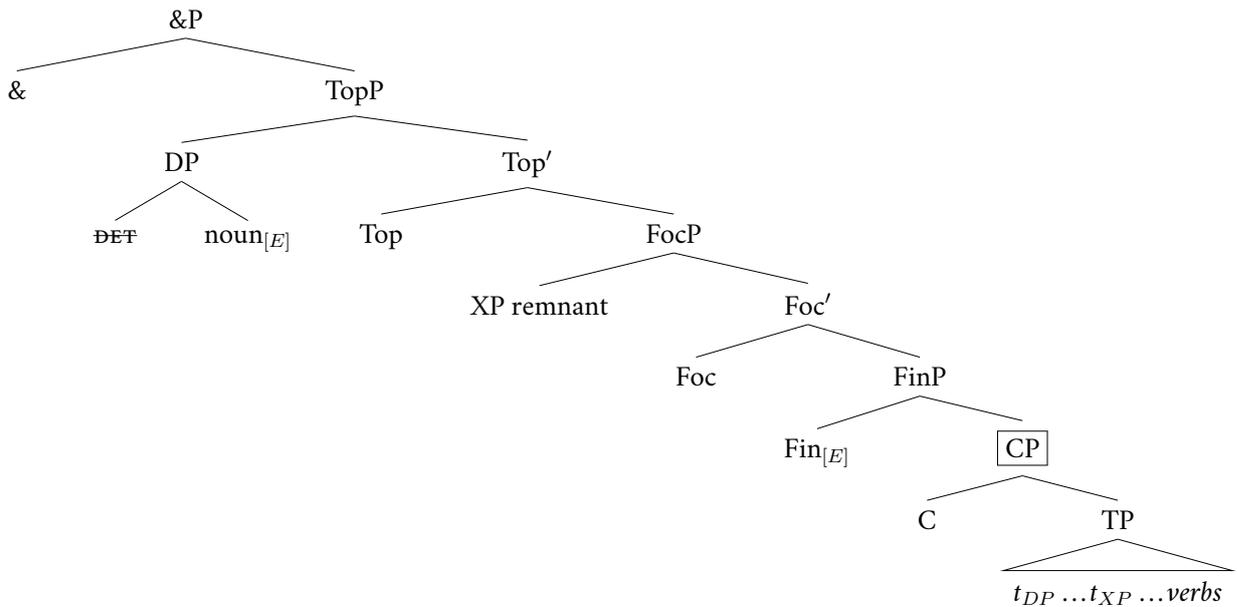
3.1 Accounting for the properties of DS

Gen1 The dependency on gapping (ex. 1, 2): [E]-licensing by Agree with gapping-[E]

Gen2 Conjunct initiality (ex. 3, 11): The requirement to be conjunct-initial should be reduced to Minimality. Other DPs/XPs are defective interveners in the Agree relation between [E] on Fin^0 and [E] on N^0.

Gen3 impossible DETs (ex. 4a): Numerals and indefinite articles are considered to be *lower* nominal projections (e.g. Julien 2002). They might be so low that they are not anti-local enough.

Gen4 No skipping (ex. 5): Also a Minimality effect. [E] can re-apply and successively delete all c-commanding, anti-local elements. A potential elidee cannot be skipped.

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[2]Gapping-[E] also needs to be licensed by a c-commanding head, e.g. &.

4 Implications and extensions

- German DS shows a curious behavior with cardinal numbers. On their own, they can never be shared, (24-a). However, as part of a complex modifier, they can be, (24-b).

(24) a. *Zwölf Mädchen machen Tee und ~~zwölf~~ Jungen ~~machen~~ Kaffee.
twelve girls   make   tea and twelve boys   make   coffee
b. Alle 12 Mädchen machen Tee und ~~alle 12~~ Jungen ~~machen~~ Kaffee.
all   12 girls   make   tea and all   12 boys   make   coffee

- This suggests that ellipsis is subject to the **Principle of Minimal Compliance** (Richards 1998, 2001; Preminger 2019), (25).

(25) *Principle of Minimal Compliance* (Preminger 2019)
Once a probe P has successfully targeted a goal G, any other goal G' that meets the same featural search criterion, and is dominated or c-commanded by G (= dominated by the mother of G), is accessible to subsequent probing by P irrespective of locality conditions.

- Low, local elements can only be elided after deletion of higher, non-local elements.
- Thus, in (24), [E] can target *"zwölf"* in a second round of application, even though that element is usually too low.

5 Conclusion

- Determiner sharing is a niche phenomenon but can potentially give us insights into the core assumptions of the analysis of ellipses.
- Interaction between different processes: syntactic licensing
- Instance of Minimal Compliance in ellipsis

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Appendix

- Lin (2002) observed that, in English, there is a difference in the gapping requirement of DS depending of the locus of DS: subject-DS only requires gapping of a finite verb or an auxiliary, while a non-finite verb in a complex predicate can surface overtly, (26-a). This is not true for object-DS, (26-b).

(26)   a.   Most girls have played the violin and __ boys (*have) studied the piano.
       b.   He has given too many magazines to Jessica and (*handed) __ books to Joanne.

- It seems that German differs from English in that it allows a non-finite verb to surface even in object-DS, (27).

(27)   Er hat jedem Lehrer Bücher gegeben und __ Schüler Magazine ausgehändigt.
       he has every teacher books given   and   student magazines handed
       "He has given books to every teacher and handed magazines to every student."

- Initially, this looks like a prediction made by the post-syntactic analysis: English is a V–O language, while German has O–V word order. If the DET has to be the first element in its conjunct, a verb would intervene in English, but not in German.
- However, this argument only holds under the assumption that coordinations are of the same size in both languages, for which there is no evidence (see discussion around 2.2.2).

More on Minimal Compliance

- The other possible pattern is that in a second round of application, [E] checks only DPs with the feature [-loc], i.e. phrases that are in the c-command domain of the [E]-carrying N, but are not local.
- PPs may be such elements (phase barriers).
- Observe the contrast in (28). In (28-a), no deletion of a determiner occured and the reading *"movies about linguists"* is not available, thus it cannot be present in the structure. (28-b) involves DS and makes the reading available.

(28)   a.   [DP **Viele** Bücher [PP über Linguisten]] hab ich gelesen und [DP viele Filme] gesehen.
             many books   about linguists   have I   read   and   many movies watched
             "I have read many books about linguists and have seen many movies (#about linguists)."
       b.   [DP **Viele** Bücher [PP über Linguisten]] hab ich gelesen und [DP ~~viele~~ Filme   ~~über~~
             many books   about linguists   have I   read   and   many movies about
             ~~Linguisten~~] gesehen.
             linguists   watched
             "I have read many books about linguists and have seen many movies about linguists."