On the distribution of reflexes of successive cyclicity

Coppe van Urk, Queen Mary University of London
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This talk examines two questions about successive cyclicity:

1. Are all expected reflexes of successive cyclicity attested?

2. Are reflexes of successive cyclicity equally distributed across syntactic domains (e.g. CP, vP, DP, PP)?

Table 1. Reflexes of successive cyclicity at CP and vP.

		CP	vP
	Effect on intermediate head		
1.	Extraction marking	Irish, Dinka, . . .	Defaka, Malay, . . .
2.	φ-agreement	Dinka, Kinande, Wolof, . . .	Kiribati, Passamaquoddy, . . .
3.	V2	German, Dinka	Dinka
4.	Inversion	Belfast English, Spanish, . . .	Mòcheno
	PF presence of copy		
4.	Stranding	West Ulster English, Polish	West Ulster English, Dutch, Polish
5.	Multiple copy spell-out	German, Frisian, Seereer, . . .	Dinka
6.	*Wh*-trapping/clausal pied-piping	Basque, Quechua	Trinidadian English, Ewe
	LF presence of copy		
7.	Parasitic gaps	(English? Bavarian?)	English, . . .
8.	Scope trapping	English, . . .	English, . . .

From the resulting survey, presented in Table 1, a **consistent picture emerges**:

▷ We can create a **predictable taxonomy of successive cyclicity effects**. The reflexes we find are those we expect if long-distance dependencies involve successive steps of **feature-driven** movement that leaves **copies** (Chomsky 1995; McCloskey 2002; Abels 2012).

▷ There is **symmetry** between the CP and vP in phasehood (contra, for instance, Rackowski and Richards 2005, Den Dikken 2009, 2010, and Keine 2016).

▷ However, there is **an asymmetry between CP/vP and PP/DP** (see also Bošković 2014). Most of the effects in Table 1 lack counterparts in the PP/DP domain. On this basis, I suggest that PP/DP **may lack intermediate movement**.

1 Three views of successive cyclicity

Across languages, long-distance dependencies display **successive cyclicity effects**, but how these are implemented varies across approaches and frameworks. I will distinguish **three views of successive cyclicity**, according to assumptions about the intermediate position IntP:
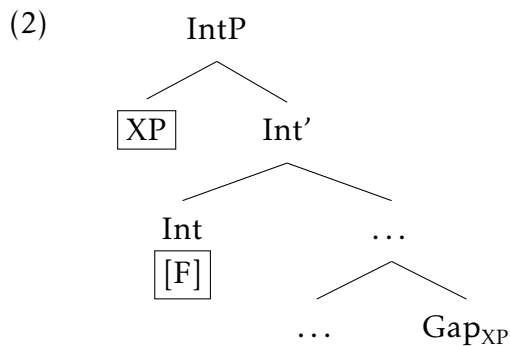
1. **Feature percolation:**

   In HPSG/LFG, successive cyclicity reflects a mechanism of **feature percolation** (e.g. Pollard and Sag 1994; Dalrymple 2001). See also Neeleman and Van de Koot (2010).
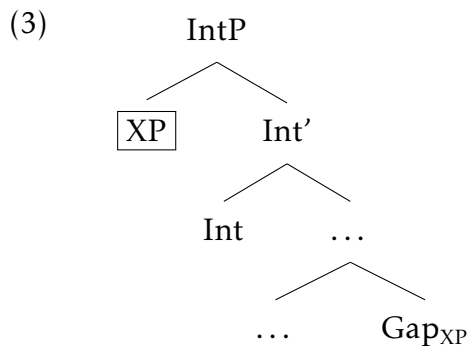
   (1)

   ```
            IntP
            [F]
           /    \
        Int      ...
                /    \
             ...      Gap
   ```
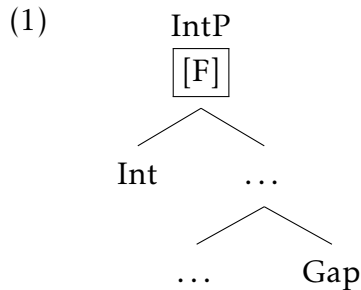
2. **Feature-driven intermediate movement:**

   Chomsky (1995) proposes that successive cyclicity reflects intermediate movement, driven by **feature checking** (see also McCloskey 2002; Abels 2012; Georgi 2014):

   (2)

   ```
            IntP
           /    \
        XP       Int'
                /    \
             Int      ...
             [F]     /    \
                  ...      Gap_XP
   ```

3. **Featureless intermediate movement:**

   A prominent alternative is that intermediate movement is driven by **a featureless mechanism** (e.g. Heck and Müller 2000, 2003; Bošković 2002, 2007; Chomsky 2013):

   (3)

   ```
            IntP
           /    \
        XP       Int'
                /    \
             Int      ...
                     /    \
                  ...      Gap_XP
   ```

We can categorize these approaches according to their predictions about the **types of reflexes of successive cyclicity** (= the boxed elements in 1–3).

Table 2. Expectations about reflexes of successive cyclicity.

	Effect on intermediate head	PF/LF presence of copy
Feature percolation	yes	no
Feature-driven movement	yes	yes
Featureless movement	no*	yes

*__Caveat:__ As Preminger (2011) points out, a featureless movement view might expect to occasionally encounter morphological effects on intermediate heads, because the copy could function as an **allomorphy trigger**.


Main message:
I will argue that the attested reflexes of successive cyclicity suggest a **featural component** and the **presence of copies**, lending support to feature-driven intermediate movement.

Outline of the talk:

 ▷ Section 2 surveys evidence for a **featural component** in intermediate movement
 ▷ Section 3 and 4 present evidence for **copies**. Throughout sections 2 through 4, I emphasize the symmetry of CP and *v*P.
 ▷ Section 5 examines successive cyclicity effects in PPs and DPs, and argues for a **qualitative asymmetry** in the types of effect that are found

2 Effects on the intermediate head

I distinguish **three types** of effects visible on the intermediate head:

(4)
Effects on intermediate head

Morphological form   Satisfaction of other features   Lexical choice
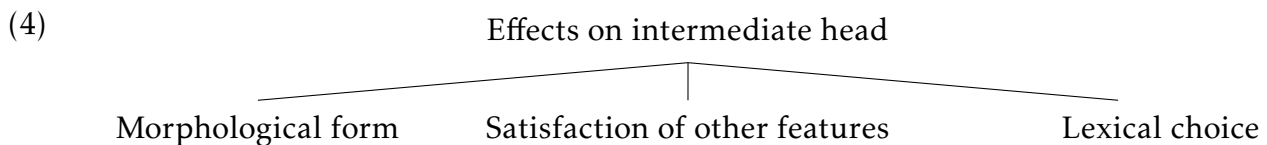
I show that these are attested at CP and *v*P and that they imply a **featural component** to successive cyclicity.

2.1 Morphological form

The simplest way in which the presence of a feature can affect an intermediate head is through the morphological realization of the **checking/valuation of the feature F**. This results in **extraction marking**, morphemes that appear only in the context of movement.

2.1.1 Extraction marking at CP edge

There are many examples of extraction marking at the CP edge:

▷ **Irish complementizers.**
  Irish complementizers provide a well-known example (e.g. McCloskey 1979, 2001, 2002):

(5)   *Two different complementizers in Irish:*

    a. Creidim   [_CP_ **gu**-r   inis sé bréag].
        believe.1sg   c.dcl-past tell he lie
        'I believe that he told a lie.'

    b. an fhilíocht [_CP_ **a**   chum   sí ___]
        the poetry   c.ext composed she
        'the poetry that she composed'
        (McCloskey 2002:185–186)

(6)   *Extraction complementizer appears in intermediate clauses:*

    an t-ainm [_CP_ **a**   hinnseadh dúinn [_CP_ **a**   bhí ___ ar an áit]]
    the name   c.ext was-told   to-us   c.ext was   on the place
    'the name that we were told was on the place'
    (McCloskey 2002:185)

▷ Other languages with such patterns include at least Chamorro (Chung 1982), Seereer (Baier 2014), Kîîtharaka (Abels and Muriungi 2008), Wolof (Torrence 2005), and Dinka (Van Urk 2015).

2.1.2 Extraction marking at vP edge

Extraction marking is found at the *v*P edge as well:

▷ **An extraction morpheme in Defaka.**
  Bennett et al. (2012) describe a ***v*P-level extraction morpheme** in Defaka (Ijoid). In Defaka, the morpheme *kè* appears on all verbs crossed by movement:

(7)   *Defaka -kè appears on all intermediate verbs:*

    a. Bruce ndò Bòmá jírí-**kè**   [_CP_ ___ á ésé-mà]
        Bruce foc Boma know-ext   her see-nfut
        'It is Bruce that Boma knows saw her.'

    b. áyá jíkà   ndò Bòmá ì bíè-**kè**   [_CP_ ì ísò ___ sónó-mà-**kè**]
        new house foc Boma I ask-ext   I iso   buy-nfut-ext
        'It is a new house that Boma asked me if I'm going to buy.'

This morpheme is *v*P-internal, because it is not triggered by a local subject (8a–c):

(8)   *Defaka -kè appears with non-subject extraction:*

    a. ì kò   Bòmá ésé-kà-rè
        I foc.sbj Boma see-fut-neg
        'It is me that will not see Boma.'

    b.   tárì ndo Àmànyà ómgbìnyà sónò àmà-**kè** ___ kíˈá   ˈté?
        who FOC Amaya shirt   buy give-EXT   market P
        'Who did Amaya buy a shirt for at the market?'

    c.   [PP ándù kìkìà] ndò à   èbèrè rì bòi-mà-**kè**
           canoe under FOC the dog   RE hide-NFUT-EXT
        'It is under the canoe that the dog is hiding.'
        (Defaka; Bennett et al. 2012:294,296)

▷ *MeN-deletion in Malay/Indonesian.*
A similar pattern at the *v*P edge is voice marking in Malay/Indonesian languages (e.g. Saddy 1991, 1992; Cole and Hermon 1998; Sato 2012). In these languages, extraction across a verb triggers obligatory deletion of the transitivity prefix *meN-*:

(9)   *MeN- cannot appear on intermediate verbs:*

    siapa Bill **(*mem)**-beritahu ibunya   [CP yang ___ **(men)**-yintai Fatimah]?
    who Bill **(*meN)**-tell   mother.his   that   **(meN)**-love Fatimah
    'Who does Bill tell his mother that loves Fatimah?'
    (Malay; Cole and Hermon 1998:232)

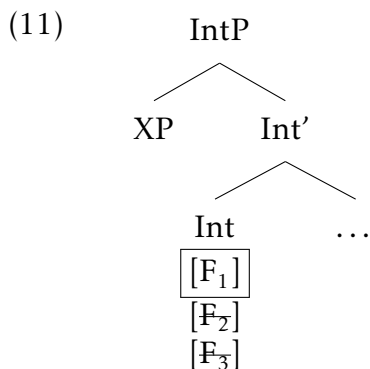As with Defaka, subjects do not trigger *meN*-deletion:

(10)   *No MeN- deletion with movement of subjects:*

    a.   siapa **(mem)**-beli   buku itu?
        who **(meN)**-bought book that
        'Who bought that book?'

    b.   apa   Ali **(*mem)**-beri pada Fatimah?
        what Ali **(*meN)**-gave to   Fatimah
        'What did Ali give to Fatimah?'
        (Malay; Cole and Hermon 1998:231)

Similar *v*P-level effects may be found in Tagalog (Rackowski and Richards 2005) and Asante Twi (Korsah and Murphy 2016).

2.2   Satisfaction of other features: φ-agreement and V2

Another way in which successive-cyclic movement affects intermediate heads is through the **satisfaction of independent features** on the intermediate head:

(11)   IntP

$$
\begin{array}{c}
\text{IntP} \\
\diagup \quad \diagdown \\
\text{XP} \quad \text{Int}' \\
\diagup \quad \diagdown \\
\text{Int} \quad \ldots \\
\boxed{[\text{F}_1]} \\
[\text{F}_2] \\
[\text{F}_3]
\end{array}
$$

I suggest that these additional features may be checked through **Parasitic Agree**, versions of which can be found in work on a variety of phenomena (e.g. Chomsky 2001; Bruening 2002; Kotek 2014; Deal 2014; Van Urk 2015).

(12)   **Parasitic Agree:**
        If a Probe on a certain head H has found a goal G, other probes on H can also enter into Agree/Attract relations with G.

If Agree may sometimes be parasitic, we expect feature-driven intermediate movement to be able to satisfy unrelated features.[1]

2.2.1   φ-agreement at the CP edge

The first parasitic agreement effect I discuss is the observation that intermediate movement can be accompanied by φ-agreement with the intermediate head in some languages.

▷ **φ-agreement at CP in Dinka.**
In Dinka, intermediate movement to the CP edge results in φ-agreement. In (13a–b), relativization or topicalization of a plural DP is signalled by a **plural agreement prefix** at intermediate clause boundaries:[2]

(13)   *Intermediate movement triggers φ-agreement:*
        a.   Yè **kˆɔɔc-kó**   [$_{CP}$ *Op* ė̩-$\boxed{\textbf{kè}}$-yá   ké tàak   [$_{CP}$ è̩ ___
             be **people.cs1-which**   PST-PL-HAB.2SG 3PL think.NF   C
             ė̩-$\boxed{\textbf{kè}}$-cí̩i   Áyèn   ké gâam gàlàm]]?
             PST-PL-PRF.OV Ayen.GEN 3PL give.NF pen
             'Which people did (s)he think that Ayen had given a pen to?'
        b.   **Wɔ̂ɔk** yí̩i   Bôl   ké luêeel [$_{CP}$ è̩ ___ ė̩-$\boxed{\textbf{kè}}$-lέɛt   Áyèn   ké].
             we   HAB.OV Bol.GEN 3PL say.NF   C   PST-PL-insult.OV Ayen.GEN 3PL
             'Us, Bol says Ayen was insulting.'

See Van Urk (2015) for an account of this as a parasitic agreement effect.

▷ **Noun class agreement in Kinande.**
A similar agreement pattern is found in some Bantu languages (Schneider-Zioga 2007). In Kinande, long-distance movement is accompanied by agreement in noun class with the moving phrase at every clause edge (14).

(14)   *Noun class agreement at the CP edge in Kinande:*
        ekihi $\boxed{\textbf{kyo}}$ Kambale a-asi   [$_{CP}$ nga $\boxed{\textbf{kyo}}$ Yosefu a-kalengekanaya [$_{CP}$ nga
        7.what 7.FOC Kambale AGR-know   C   **7.FOC** Joseph AGR-thinks   C
        $\boxed{\textbf{kyo}}$ Mary a-kahuka]]
        7.FOC Mary AGR-cooks
        'What did Kambale know that Joseph thinks that Mary is cooking (for dinner)?'
        (Kinande; Schneider-Zioga 2007:422)

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[1]Variation in this domain can be achieved by ordering the activation of features (see Kotek 2014, for instance).
[2]See Van Urk (2015) for a detailed analysis of Dinka clause structure that places this agreement at C.

▷ Another pattern of φ-agreement at C is described by Torrence (2005) in Wolof.

2.2.2 φ-agreement at the vP edge

We can find similar cases at the verb phrase level:

▷ **Participial endings in Passamaquoddy.**
As Bruening (2001) shows, Ā-movement in Passamaquoddy can trigger **agreeing endings on participial verbs** that lie on the path of the dependency:

(15) *Passamaquoddy verbs may agree with Ā-moving phrases:*

  a. **Wen-ik** kisitahatom-on-ik   [_CP_ keti-naci-wikuwamkom-oc-ik]?
     who-3PL decide.IO-2CONJ-**PART.3PL**   IC.FUT-go.do-visit.AO-2CONJ-**PART.3PL**
     'Who all did you decide to go visit?'
  b. Wot **nit pahtoliyas** [_CP_ Mali elitahasi-c-il   [_CP_ eli wen
     this **that priest**   Mary IC.think-3CONJ-**PART.OBV**   C someone
     kisi-komutonom-ac-il]]
     PERF-rob.AO-3CONJ-**PART.OBV**
     'This is the priest that Mary thinks someone robbed.'
     (Passamaquoddy; Bruening 2006:34)

Bruening (2001:209) analyzes this as parasitic agreement as a result of movement to *v*P.

▷ **Object agreement in Kiribati.**
Sabel (2013) shows that long-distance movement in Kiribati and Fijian affects object agreement on the verbs on the path of movement:

(16) *Object agreement in Kiribati tracks intermediate movement:*

  a. Ti ata-i-a   [_CP_ bwa e   tangir-i-ia Meeiri ao Tien Rui].
     1PL know-TR-**3SG**   that 3SG loves-TR-**3PL** Meeri and Tien Rui

     'We know that Rui loves Meeri and Tien.'
  b. **Meeiri ao Tien** aika ti   ata-i-ia   [_CP_ bwa e   tangir-i-ia ___ Rui].
     Meeri and Tien FM 1PL know-TR-**3PL**   that 3SG loves-TR-**3PL**   Rui
     'It is Meeri and Tien that we know that Rui loves.'

▷ **Object agreement in Hungarian.**
Movement in Hungarian may also have repercussions for object agreement (e.g. Den Dikken 2010). In (17), we see that long Ā-movement may be accompanied by changes in agreement on intermediate verbs as well as accusative case on the moving phrase.

(17) *Long movement in Hungarian may trigger changes in case and agreement:*

  Téged   mondta-lak [_CP_ hogy szeretné-lek   [_CP_ hogy elnök   **leygél**]].
  you.ACC said-**1SG→2**   that would.like-**1SG→2**   that president **be.2SG**

  'It is you that I said that I would like to be president.'
  (Hungarian; Den Dikken 2010:13)

See Den Dikken 2010 for extensive discussion of this and related patterns.

2.2.3 V2 at the CP edge

Another requirement of an intermediate head that can be satisfied by intermediate movement is **the V2 property**, which can also be thought of as parasitic feature checking.

▷ **V2 in embedded clauses in Dinka.**
  As shown by Van Urk and Richards (2015), Dinka has V2 in embedded clauses. Interme-
  diate movement must satisfy the V2 property of C:

(18) *Long-distance movement and V2:*
  a. Yè ŋà   yừụkừ   luêeel [CP (___) cé   ___ cuî̠in câam]?
      be **who** HAB.1PL say.NF   has   food eat.NF
      'Who do we say [CP ___ has eaten food]?'
  b. *Yè ŋà   yừụkừ   luêeel [CP (cuî̠in) àcí̠i ___ câam]?
      be **who** HAB.1PL say.NF   food has.ov   eat.NF
      'Who do we say [CP has eaten food]?'
  c. Yè ŋó̠   yừụkừ   luêeel [CP (___) cí̠i   Bôl   ___ câam]?
      be **what** HAB.1PL say.NF   has.ov Bol.GEN   eat.NF
      'What do we say [CP Bol has eaten ___]?'
  d. *Yè ŋó̠   yừụkừ   luêeel [CP (Bòl) àcé̠ ___ câam]?
      be **what** HAB.1PL say.NF   Bol has   eat.NF
      'What do we say [CP Bol has eaten ___]?'

▷ **Movement out of V2 clauses in German.**
  Similarly, Thiersch (1978) points out that extraction from V2 clauses in German must sat-
  isfy the V2 requirement, resulting in overt V1 order (19a–b).

(19) *Extraction satisfies V2 in German:*
  a. **Wen**   sagt Johan [CP (___) sehe   er   ___]?
      who.ACC says Johan   see.SBJ he
      'Who does Johan say that he is seeing?'
  b. ***Wen**   sagt Johan [CP (er) sehe   ___]?
      who.ACC says Johan   he see.SBJ
      'Who does Johan say that he is seeing?'
      (German; Thiersch 1978:135)

2.2.4 V2 at the vP edge

An analogous V2 effect is found in the verb phrase in Dinka (Van Urk and Richards 2015; Van Urk 2015). The Dinka verb phrase has a V2 effect, so that **one DP must occur at its left edge**, preceding the base position of the main verb, as with the ditransitive in (20a–d):

(20) *Dinka vP has V2 effect:*
  a. Yî̠in cé̠   [vP (Àyén) gàam   cáa].
      you PRF.SV   Ayen give.NF milk
      'You have given Ayen milk.'
  b. Yî̠in cé̠   [vP (cáa) gàam   Àyén].
      you PRF.SV   milk give.NF Ayen
      'You have given milk to Ayen.'

c. *Yîin cẹ́ [$_{v\text{P}}$ ⬚___⬚ gàam cáa Àyén].
you PRF.SV   give.NF milk Ayen
'You have given Ayen milk.'

d. *Yîin cẹ́ [$_{v\text{P}}$ ⬚cáa⬚ ⬚Àyén⬚ gàam].
you PRF.SV   milk Ayen give.NF
'You have given Ayen milk.'

When an object is extracted from inside the verb phrase, however, the same effect as at the CP edge is observed. Intermediate movement satisfies vP V2, as demonstrated in (21a–d).

(21)   *Object extraction satisfies V2:*

     a. Yè ŋó̤ [$_{\text{CP}}$ cí̤i môc [$_{v\text{P}}$ ⬚___⬚ yiɣ̰ɛn Bòl]]?
        be **what** PRF.OV man.GEN   give.NF Bol
        'What has the man given Bol?'

     b. *Yè ŋó̤ [$_{\text{CP}}$ cí̤i môc [$_{v\text{P}}$ ⬚Bòl⬚ yiɣ̰ɛn]]?
        be **what** PRF.OV man.GEN   Bol give.NF
        'What has the man given Ayen?'

     c. Yè ŋà [$_{\text{CP}}$ cí̤i môc [$_{v\text{P}}$ ⬚___⬚ yiɣ̰ɛn kítàap]]?
        be **who** PRF.OV man.GEN   give.NF book
        'Who has the man given the book to?'

     d. *Yè ŋà [$_{\text{CP}}$ cí̤i môc [$_{v\text{P}}$ ⬚kítàap⬚ yiɣ̰ɛn]]?
        be **who** PRF.OV man.GEN   book give.NF
        'Who has the man given the book to?'

2.3 Lexical choice

Another way in which intermediate movement can affect the intermediate head is by having an effect on **lexical choice**. If intermediate movement is feature-driven, we may expect that intermediate heads can vary in whether they carry a **movement trigger**:[3]

(22)

```
        IntP
        /  \
      XP   Int'
           /  \
        Int₁   ...
         [F]
```

(23)

```
        IntP
        /  \
     Int₂   ...
            /  \
          ...   XP
```

Intermediate movement can then differentiate between two different flavors of a head. For example, in Russian, movement is banned out of indicative clauses, but possible out of subjunctives:

(24)   *Long-distance movement in Russian depends on complementizer:*

     a. *Kakuju knigu ty dumaeš' [$_{\text{CP}}$ **čto** Petr pročital ___]?
        which book you believe   **that.IND** Petr read
        'Which book do you believe that Petr read?'

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[3]Note that, empirically, such cases may be hard to distinguish from extraction marking.

b. Kakuju knigu ty   dumaeš' [$_{CP}$ **čtoby**   Petr pročital ___]?
   which   book you believe   **that.ꜱᴜʙᴊ** Petr read
   'Which book do you believe that Petr read?'
   (Müller and Sternefeld 1993)

In the *v*P, an analogous effect occurs in Nupe. Extraction is blocked from verb phrases headed by **perfect aspect**:[4]

(25)   *Movement out of perfect vPs impossible in Nupe:*
   a.   Ke   Musa pa   ___ o?
        what Musa pound   o
        'What did Musa pound?'
   b.   Ke   Musa **à**   pa   ___ o?
        what Musa **ꜰᴜᴛ** pound   o
        'What will Musa pound?'
   c.   *Ke   Musa **á** pa   ___ o?
        what Musa **ᴘʀꜰ** pound   o
        'What has Musa pounded?'
        (Nupe; Kandybowicz 2008:288)

This type of variation is expected under a feature-driven approach.

2.3.1   Inversion at CP

Another effect that can be analyzed in this fashion is **inversion**.

In a number of languages, subject and auxiliary must invert if intermediate movement targets the CP edge (e.g. Kayne and Pollock 1978; Torrego 1984; Henry 1995). I illustrate with Belfast English (Henry 1995):

(26)   *Inversion in Belfast English:*
   a.   Who did John hope [$_{CP}$ **would** he see ___]?
   b.   What did Mary claim [$_{CP}$ **did** they steal ___]?
        (Belfast English; Henry 1995:109)

We can make sense of this if the null C that hosts intermediate movement (because it hosts a featural trigger) also happens to attract T.[5]

2.3.2   Inversion at vP

A similar inversion effect at the *v*P edge related to movement is documented by Cognola (2013) in work on the Germanic dialect Mòcheno, spoken in northern Italy. Mòcheno allows both OV and VO orders in the verb phrase:

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[4]See Kandybowicz (2008) for arguments that the perfect aspect morpheme is a *v*P-internal head.

[5]It is worth noting that, in Romance languages, the auxiliary and verb invert together, so that inversion in these languages is not obviously the result of T-to-C movement. I set aside this issue here.

(27)   *Mòcheno allows VO and OV order:*

    a.   Gester   hone   [$_{v}$P a puach **kaft**].
          yesterday have-1sɢ   a book **bought**
          'Yesterday, I bought a book.'

    b.   Gester   hone   [$_{v}$P **kaft**   a puach].
          yesterday have-1sɢ   **bought** a book
          'Yesterday, I bought a book.'
          (Mòcheno; Cognola 2008:81)

However, in the context of *wh*-movement, only VO syntax is possible:

(28)   *Inversion in the vP with wh-movement in Mòcheno:*

    a.   Ber hòt [$_{v}$P **kaft**   s   puach]?
          who has   **bought** the book
          'Who bought the book?'

    b. *Ber hòt [$_{v}$P s   puach **kaft**]?
          who has   the book **bought**
          'Who bought the book?'

    c.   En bem   hòt-se [$_{v}$P **kaft**   de zaitung]
          to whom has-she   **bought** the newspaper
          'Who has she bought a newspaper?'

    d. *En bem   hòt-se [$_{v}$P de zaitung   **kaft**]
          to whom has-she   the newspaper **bought**
          'Who has she bought a newspaper?'
          (Mòcheno; Cognola 2013:7)

Intermin conclusions:

  ▷ The existence of these effects provide evidence for **a featural component** in intermediate movement, as in a percolation or feature-driven approach.
  ▷ These featural effect are **equally distributed** across the CP/*v*P domain, providing evidence that these are parallel domains.

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3   PF presence of copy

I will now turn to **evidence for movement**. I'll divide these effects into two types:

  ▷ Evidence for the PF presence of copies
  ▷ Evidence for the LF presence of copies

We will see that these effects too are symmetrically distributed across CP and *v*P edges.

3.1 Stranding

One reflex of successive-cyclic movement that reveals the presence of a copy is **stranding in intermediate positions** (e.g. McCloskey 2000; Barbiers 2002; Henry 2012).

▷ *All*-**stranding in West Ulster English at CP and *v*P.**
McCloskey (2000) points out that complex *wh*-phrases such as *what all* may strand *all* at Spec-CP in West Ulster English (29a–c).

(29)   *All-stranding in West Ulster English:*
    a.   **What all** did he say [$_{CP}$ he wanted ___]?
    b.   **What** did he say [$_{CP}$ **all** he wanted ___]?
    c. ?**What** did he say to him [$_{CP}$ **all** that he wanted to buy ___]?
       (West Ulster English; McCloskey 2000:61,63)

In a study of West Ulster varieties, Henry (2012) shows that several varieties allow stranding at the edge of *v*P as well. In South Derry English, only *v*P-stranding is tolerated:

(30)   *All-stranding only at vP in South Derry English:*
    a.   **What** did he [$_{vP}$ **all** do ___ on holiday]?
    b.   **What** did he [$_{vP}$ **all** say [$_{CP}$ that he did ___ on holiday]]?
    c. *****What** did he [$_{vP}$ say [$_{CP}$ **all** that he did ___ on holiday]]?
       (Henry 2012:28)

Speakers of East Derry English allow stranding everywhere:

(31)   *All-stranding at vP and CP in East Derry English:*
    a.   **What** did he [$_{vP}$ **all** do ___ in Derry]?
    b.   **What** did he say [$_{CP}$ **all** that he did ___ in Derry]?
    c.   **What** did he [$_{vP}$ **all** say [$_{CP}$ that he did ___ in Derry]]?
       (Henry 2012:31)

▷ **Stranding at *v*P in Dutch.**
As pointed out by Barbiers (2002) and Koopman (2010), a similar pattern is found in Dutch, with stranding of the quantifier *allemaal* (32a–b). In Dutch, this stranding must be at *v*P:

(32)   *Stranded allemaal in Dutch occurs at intermediate vP:*
    a.   Wat   heeft hij gezegd [$_{CP}$ dat hij **allemaal** wil   hebben]?
        what has   he said   that he **all**   wants have.**NF**
        'What all has he said that he wants to have?'
    b.   Wat   heeft hij **allemaal** gezegd [$_{CP}$ dat hij ___ wil   hebben]?
        what has   he **all**   said   that he   wants have.**NF**
        'What all has he said that he wants to have?'
    c. *Wat   heeft hij gezegd [$_{CP}$ **allemaal** dat hij ___ wil   hebben]?
        what has   he said   **all**   that he   wants have.**NF**
        'What all has he said that he wants to have?'
        (Dutch; adapted from Koopman 2010:268)

Prepositions can be stranded in the same positions:

(33) *Preposition stranding at intermediate vP in Dutch:*

    a. **Waar** had jij dan gedacht [$_{CP}$ dat je de vis **mee** zou moeten
       where had you then thought   that you the fish **with**   would
       snijden]?
       have.to.NF cut.NF
       'With what had you then thought that you would have to cut the fish?'

    b. **Waar** had jij dan **mee** gedacht [$_{CP}$ dat je de vis ___ zou   moeten
       where had you then **with** thought   that you the fish   would have.to.NF
       snijden]?
       cut.NF
       'With what had you then thought that you would have to cut the fish?' (Dutch;
       adapted from Barbiers 2002:49)

▷ **NP stranding in Polish.**
Wiland (2010) points out that Left-Branch Extraction in Polish allows for the NP out of which extraction takes place to be stranded in intermediate positions, including the edge of *v*P and the edge of CP:

(34) *Polish LBE may strand NP in intermediate positions:*

    a. **Jaki** Pawel [$_{vP}$ **samochód** kupil   swojej żonie ___]?
       what Pawel   **car**   bought his   wife
       'What car did Pawel buy his wife?'

    b. ?**Jaki** myślisz   [$_{CP}$ **samochód** Pawel kupil   swojej żonie ___]?
       what thought.2SG   **car**   Pawel bought his   wife
       'What car did you think Pawel bought his wife?'

    c. %**Jaki** Maria [$_{vP}$ **samochód** myślala [$_{CP}$ że   Pawel kupil   swojej żonie ___]]?
       what Maria   **car**   thought   that Pawel bought his   wife
       'What car did Mary think Pawel bought his wife?'

3.2   Multiple copy spell-out

Another effect that reveals the presence of a copy is **multiple copy spell-out**:

▷ *Wh*-**copying.**
In a number of languages, *wh*-movement can be accompanied by *wh*-copying, so that a copy of the *wh*-phrase appears in all Spec-CP positions on the path of movement. Such constructions are found in German, Frisian, and Passamaquoddy, for example (35a–b).

(35) *Examples of wh-copying:*

    a. **Wen** glaubst du   [$_{CP}$ $\boxed{\textbf{wen}}$ sie getroffen hat]?
       who believe you   **who** she met   has
       'Who do you believe she has met?'
       (German; Felser 2004)

    b. **Wêr**   tinke jo   [$_{CP}$ $\boxed{\textbf{wêr}}$ 't   Jan wennet]?
       where think you   **where**-C Jan lives
       'Where do you think that Jan lives?'
       (Frisian; Hiemstra 1986:99)

c. **Tayuwe** kt-itom-ups [$_{CP}$ ⎡tayuwe⎤ apc k-tol-i malsanikuwam-ok]?
   when 2-say-DUB **when** again 2-there-go store-LOC
   'When did you say you're going to go to the store?'
   (Passamaquoddy; Bruening 2006:26)

I adopt the view that such copies are realization of intermediate copies, as argued by Felser (2004) and Bruening (2006).

▷ **Pronoun copying in Seereer.**
Baier (2014) describes a similar pattern in Seereer. As evident in (36a–b), intermediate copies at the clause edge in Seereer are spelled out as pronouns:

(36)   *Pronoun copying in Seereer:*
   a. **Xar** foog-o [$_{CP}$ yee ⎡ten⎤ Yande a-lay-u [$_{CP}$ yee ⎡ten⎤ Jegaan
      what think-2SG.EXT C **3SG** Yande 3-say-EXT C **3SG** Jegaan
      a-ga'-u]]?
      3-see-EXT
      'What do you think Yande said Jegaan saw?'
   b. **Aniin** foog-o [$_{CP}$ yee ⎡den⎤ Yande a-lay-u [$_{CP}$ yee ⎡den⎤ Jegaan
      who.PL think-2SG.EXT C **3PL** Yande 3-say-EXT C **3PL** Jegaan
      a-ga'-u]]?
      3-see-EXT
      'Who all do you think Yande said Jegaan saw?'
      (Seereer; Baier 2014)

▷ *Ké*-**copying at *v*P in Dinka.**
A similar effect happens at *v*P in Dinka. In Dinka, copies left at the *v*P edge by Ā-movement are spelled out as pronouns, in the same position as the V2 effect:[6]

(37)   *Movement in Dinka triggers pronoun copying at vP edge:*
   a. Bòl à-cé **ròoor** [$_{CP}$ cè̤ [$_{vP}$ ⎡kêek⎤ lâat]] tî̤iŋ.
      Bol 3s-PRF **men** PRF.3SG **3PL** insult.NF see.NF
      'Bol has seen the men he has insulted.'
   b. Yè **kɔ̂ɔc-kó** [$_{CP}$ yí̤i Bôl [$_{vP}$ ⎡ké⎤ luêeel [$_{CP}$ è̤ cí̤i Áyèn
      be **people.CS1-which** HAB.OV Bol.GEN **3PL** say.NF C PRF.OV Ayen.GEN
      [$_{vP}$ ⎡ké⎤ tî̤iŋ]]]?
      3PL see.NF
      'Which people does Bol say Ayen has seen?'

See Van Urk (2016) for extensive arguments that this reflects multiple copy spell-out.

3.3   *Wh-trapping and clausal pied-piping*

A third piece of evidence for intermediate movement, also noted by Abels (2012:sec. 3.3–3.4) comes from the interaction of intermediate movement with **pied-piping**. If a phasal domain can be pied-piped, the moving phrase remains in the position of intermediate movement.

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[6]Note that copying is limited to plurals, as extensively discussed in Van Urk 2015.

▷ **Clausal pied-piping and intermediate movement in Basque and Quechua.**
In languages with **clausal pied-piping** (e.g. Hermon 1985; Ortiz de Urbina 1989; Arregi 2003), intermediate movement still takes place inside that CP (38a–b).

(38) *Clausal pied-piping in Quechua and Basque:*

    a. [$_{CP}$ **Ima-ta**   wawa   ___ miku-chun-taj] Maria muna-n?
          what-ACC child.NOM   eat-SUBJ-Q   Maria want-PR.3
          'What does Maria want that the child eat?'
          (Imbabura Quechua; Hermon 1985:151)

    b. [$_{CP}$ **Se**   idatzi   rabela Jonek] pentzate su?
          what written has   Jon.ERG you-think
          'What do you think Jon wrote?'
          (Basque; Arregi 2003:118)

This is evidence that there is a step of intermediate movement in the CP. See also Heck (2008: sec. 2.3) for arguments that movement of infinitives in German relatives involves a similar configuration of clausal pied-piping.[7]

▷ **Predicate clefting and pied-piping in Trinidadian English.**
Cozier (2006) describes an interaction between intermediate movemen and predicate clefting in Trinidadian English. Trinidadian English allows long-distance predicate clefting:

(39) *Predicate clefting in Trinidadian English:*

    a. Is **walk** [that Tim did *walk*].
    b. Is **talk** [he tell me [that she *talk* about Ricky]].
        (Trinidadian English; Cozier 2006:660,663)

Cozier argues that predicate clefting is phrasal movement, based on the observation that low adverbs to the left of the verb can be moved along:[8]

(40) *Predicate cleft pied-pipes material to the left:*

    a. Is **briefly touch** [he did *touch* upon that matter].
    b. Is **cleverly avoid** [he *avoid* the question].
        (Trinidadian English; Cozier 2006:666)

Importantly, *wh*-words that have undergone intermediate movement to the edge of the verb phrase can be pied-piped as well, as in (41a–d).

(41) *Predicate cleft may pied-pipe wh-words:*

    a. Is **what fix** [he did *fix* ___ yesterday]?
    b. *Is **who talk** [___ *talking* about she]?
    c. Is **who tell** [Tim *tell* you [that he give the car to ___]]?
        (Trinidadian English; Cozier 2006:668,670,681)

In this way, predicate clefting reveals the intermediate position at the *v*P edge.

---

[7]An interesting observation is that clausal pied-piping is typically restricted to nominalized or infinitival clauses, which may suggest that neither full CPs or *v*Ps can be pied-piped in isolation. This does not diminish the point then that we can see the effects of intermediate movement when pied-piping of a clause is possible.

[8]Note that these adverbs must originate in the lower verb phrase, because they cannot modify the cleft clause.

▷ ***v*P-fronting and pied-piping in Ewe.**
In Ewe, nominalized *v*Ps are fronted in the progressive or prospective aspect. Buell (2012) notes this *v*P fronting pied-pipes *wh*-phrases, as long as they are generated inside the *v*P.

(42)   *Objects but not subjects and high adjuncts can be pied-piped:*
   a.   [_{*v*P} **Núkà** dù-ḿ]   nè-lè?
        what eat-PROG 2SG-be.at
        'What are you eating?'
   b.   *[_{*v*P} **Àmékà** dzó] gé   lè?
        who   leave PROSP be.at
        'Who is about to leave?'
   c.   *[_{*v*P} **Núkàtà** dzó-ḿ]   nè-lè?
        why   leave-PROG 2SG-be.at
        'Why are you leaving?'
        (Ewe; Buell 2012:4,7)

In addition, as in Trinidadian English, intermediate *wh*-phrases that have undergone long-distance movement can be pied-piped (43).

(43)   *Movement of intermediate vP can pied-pipe wh-phrase:*
   [_{*v*P} **Núkà** dí-ḿ]   nè-lè   [_{CP} bé   má- dà   ___]?
       what want-PROG 2SG-be.at   that 1SG.FUT-prepare
   'What do you want me to make?'
   (Ewe; Buell 2012:19)

4   LF presence of copy

We can also detect the presence of intermediate copies at LF.

4.1   *Parasitic gaps*

▷ Nissenbaum (2000) presents a theory of parasitic gap licensing that requires intermediate movement to the *v*P edge. Both intermediate successive-cyclic movement to *v*P and operator movement in a *v*P adjunct may create derived predicates, which can be conjoined:

(44)   *Parasitic gap configuration in Nissenbaum (2000):*
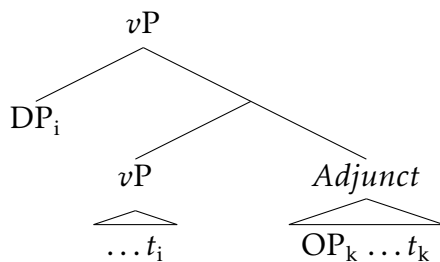
If correct, parasitic gaps provide evidence for intermediate movement to the *v*P edge.

▷ Are there CP adjuncts that may license parasitic gaps? One candidate may be *if*-clauses, which, as Engdahl (1983) notes, permit parasitic gaps for some speakers (45a–b).

(45)　*Parasitic gaps in if-clauses:*
　　a.　This is the professor that Kim says that you must not say hello to ___ if you run into ___.
　　b.　This is the professor that Kim says that, if you run into ___, ___ won't say hello to you.
　　　　(modified from Engdahl 1983:11)

As noted by Abels (2012), this configuration may also be attested in Bavarian examples like (46), discussed by Grewendorf (2012).

(46)　*Parasitic gap in conditional in Bavarian:*

　　Denn, wenn i ___ dawisch, daschlog i ___.
　　him　if　I　catch　kill　I
　　'If I catch him, I will kill him.'
　　(Bavarian; Grewendorf 2012:1)

4.2　*Scope trapping and reconstruction*

▷ One way in which the LF presence of copies can be detected is through **intermediate binding of anaphors**:

(47)　*Anaphors can be bound in intermediate positions:*
　　a.　Which picture of herself$_{i/j}$ did Sam$_i$ say [Kim$_j$ likes ___]?
　　b.　Which picture of herself$_{i/j}$ did you tell Sam$_i$ [Kim$_j$ likes ___]?

Examples like (47b) provide evidence for a CP edge position, but it's hard to construct an example that would definitively require the vP edge.

▷ Fox (1999) tries to do this through **scope trapping**, by having binding compete with Principle C. The grammaticality of (48b) requires an intermediate copy at the vP edge:

(48)　*Late Merge may apply at vP edge:*
　　a.　[$_{DP}$ Which of the papers that he$_i$ asked Ms. Brown$_k$ for] did every student$_i$ [$_{vP}$ get her$_k$ to grade ___]?
　　b.　*[$_{DP}$ Which of the papers that he$_i$ asked Ms. Brown$_k$ for] did she$_k$ [$_{vP}$ get every student$_i$ to grade ___]?
　　　　(Fox 1999:174)

We can manipulate these examples to argue for an intermediate Spec-CP position:

(49)　*Late Merge may apply at CP edge:*
　　a.　[$_{DP}$ Which of the papers that he$_i$ asked Ms. Brown$_k$ for] did you tell every student$_i$ [$_{CP}$ she$_k$ liked ___]?
　　b.　*[$_{DP}$ Which of the papers that he$_i$ asked Ms. Brown$_k$ for] did you tell her$_k$ [$_{CP}$ every student$_i$ liked ___]?

> **Conclusions:**
>
> ▷ Copies can be detected both at PF and LF. Combining this with evidence for a featural component, these facts provide evidence for **feature-driven intermediate movement** (Chomsky 1995; McCloskey 2002; Abels 2012).
> ▷ There is **no qualitative asymmetry** between CP and *v*P, since all effects can be detected in both domains (contra Rackowski and Richards 2005; Den Dikken 2009, 2010; Keine 2016). CP and *v*P are parallel phasal domains.

5 Successive cyclicity in other domains

How does this picture extends to other purported phasal domains, such as PP and DP?

There is a striking **paucity** of successive cyclicity effects in the PP/DP domain. Most of the effects described above do not have clear counterparts in the PP/DP domain.

Evidence for successive cyclicity is limited to two types of effects:

▷ Extraction marking/lexical choice
▷ Leftness effects

5.1 Extraction marking and lexical choice

▷ **Extraction marking on prepositions.**
An extraction marking effect can be found on prepositions in some languages. In Jamaican Creole (Durrleman 2008), the preposition *fi* must be realized as *fa* when stranded:

(50) *Extraction marking on preposition in Jamaican Creole:*
    a. Im bring aki [_PP_ **fi/*fa**   piknidem]
        3sɢ bring ackee **for/for.ᴇxᴛ** children
        '(S)he brought the ackee for the children.'
    b. A huu im bring dat [_PP_ ***fi/fa**   ___]?
        ᴀ who 3sɢ bring that **for/for.ᴇxᴛ**
        'Who did (s)he bring that for?'
        (Jamaican Creole; Durrleman 2008)

A similar pattern is found with the preposition *nú/ná* in Fongbe:

(51) *Extraction marking on preposition in Fongbe:*
    a. Kɔ̀kú sà mɔ̆tò ɔ́ [_PP_ **nú/*ná** Àsíbá].
        Koku sell car ᴅᴇᴛ **to/to.ᴇxᴛ** Asiba
        'Koku sold the car to Asiba.'
    b. Àsíbá wɛ̀ Kɔ̀kú sà mɔ̆tò ɔ́ [_PP_ ***nú/ná**   ___].
        Asiba ꜰᴏᴄ Koku sell car ᴅᴇᴛ **to/to.ᴇxᴛ**
        'Asiba, Koku sold the car to.'
        (Fongbe; Da Cruz 1997)

▷ **Lexical choice effects with determiners.**
There is no similar extraction marking alternation with nouns or determiners, as far as I'm aware. However, lexical choice may affect extraction, as in the Specificity Effect:

(52)   a.   Who did you see [DP a picture of ___]?
       b.   ??Who did you see [DP that picture of ___]?

Similarly, Uriagereka has noted that Galician determiners have a clitic alternant that must be used in instances of extraction:

(53)   a.   (?)De quén   liche-**los**   [DP mellores poemas de amigo ___]?
            of   whom read.2sG-**the**   best   poems of friend
            'Who did you read the best poems of friendship by?'
       b.   *De quén   liches   [DP **os**   mellores poemas de amigo ___]?
            of whom read.2sG   **the** best   poems of friend
            'Who did you read the best poems of friendship by?'
            (Uriagereka 1996:270–271)

In addition, there is a well-known correlation between the permissibility of Left-Branch Extraction and the presence of a D layer (Uriagereka 1988; Bošković 2005):

(54)   a.   Krasnuju ja kupil   [NP ___ mašinu].
            red   I bought   car
            'It is a red car that I bought.'
       b.   *Red, I bought [DP a ___ car].

Conclusions:

   ▷ Although we find some evidence for a featural component to movement out of PP/DP, most reflexes of successive cyclicity are **absent** (e.g. stranding, multiple copy spell-out, effects on agreement).
   ▷ This is support for Bošković's (2014) observation that there is **a qualitative asymmetry** between CP/vP and DP/PP in the domain of successive cyclicity.

Suggestion:
These facts could suggest that, although PP/ DP constitute phases, there is **no intermediate movement** to the PP/DP edge. This is consistent with extraction marking/lexical choice effects, if these involve alternations between phasal and non-phasal heads (*cf*. Abels 2003).

Why should be there no intermediate movement in PP/DP?

In a feature-driven account, we could interpret this as showing that P and D **lack a featural trigger** for intermediate movement. This would suggest that such triggers are in some way restricted to C and v (e.g. via a mechanism of top-down feature inheritance?).

In support of this, there is a class of effects that emerges with PPs and DPs, but seems to be absent with *v*P and CP, **leftness effects**.

▷ **A leftness effect in PPs in Dutch.**
Van Riemsdijk (1978) points out that, in Dutch, only R-pronouns appear to the left of a preposition:

(55)   *R-pronouns appear on the left:*

    a.   Je   kan [PP op **hem**] rekenen.
        you can   on **him**   count
        'You can count on him.'

    b.   Je   kan [PP **daar**-op] rekenen.
        you can   **there**-on count
        'You can count on it.'

In addition, only R-pronouns can undergo movement out of a PP:

(56)   *Only R-pronouns can move out of PPs:*

    a.   ***Wie** kan je   [PP op ___] rekenen.
        who can you   on   count
        'Who can you count on?'

    b.   **Waar** kan je   [PP ___-op] rekenen.
        where can you   -on   count
        'What can you count on?'

▷ **A leftness effect in DPs in Serbo-Croatian.**
Bošković (2016) notes a similar effect in LBE. Although LBE of adjectives is generally permitted, it is blocked when a demonstrative is present:

(57)   *Ponosnog sam vidio [NP tog ___ oca].
       proud   am seen   this   father
       'It is this proud father that I saw.'
       (Serbo-Croatian; Bošković 2016)

Bošković points out that this is a leftness effect. Demonstratives are different from other DP-internal elements, like possessors, in that they must precede adjectives:

(58)   *Demonstratives precede adjectives:*

    a.   ova skupa   slika
        this expensive picture
        'this expensive picture'

    b. ?*skupa   ova slika
        expensive this picture
        'this expensive picture'
        (Serbo-Croatian; Bošković 2016)

A puzzle about such effects is why elements that are not leftmost cannot just undergo intermediate movement. But this follows if there is **no intermediate movement** in these domains!

Conclusion

The results of this talk are summarized in the table below.

Table 1. Reflexes of successive cyclicity at CP and _v_P.

		CP	_v_P
	Effect on intermediate head		
1.	Extraction marking	Irish, Dinka, ...	Defaka, Malay, ...
2.	φ-agreement	Dinka, Kinande, Wolof, ...	Kiribati, Passamaquoddy, ...
3.	V2	German, Dinka	Dinka
4.	Inversion	Belfast English, Spanish, ...	Mòcheno
	PF presence of copy		
4.	Stranding	West Ulster English, Polish	West Ulster English, Dutch, Polish
5.	Multiple copy spell-out	German, Frisian, Seereer, ...	Dinka
6.	_Wh_-trapping/clausal pied-piping	Basque, Quechua	Trinidadian English, Ewe
	LF presence of copy		
7.	Parasitic gaps	(English? Bavarian?)	English, ...
8.	Scope trapping	English, ...	English, ...

▷ The attested reflexes of successive cyclicity suggest an approach based on **feature-driven movement** (Chomsky 1995; McCloskey 2002; Abels 2012).

▷ There is **symmetry** between the CP and _v_P in phasehood (contra, for instance, Rackowski and Richards 2005, Den Dikken 2009, 2010, and Keine 2016).

▷ However, there is **a qualitative asymmetry between CP/_v_P and PP/DP** (see also Bošković 2014). Most of the effects in Table 1 lack counterparts in the PP/DP domain. One interpretation is that DP/PP are phasal, but **may lack intermediate movement altogether**.

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