

# Resumption and Chain Reduction in Danish VP Left Dislocation

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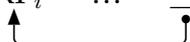
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- Danish **VP topicalization** (VPT) in (1) vs. **VP left dislocation** (VPLD) in (2):

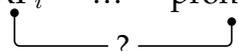
(1) [ *Sy korssting* ]<sub>i</sub> kan jeg godt \_\_\_<sub>i</sub>.      (2) [ *Sy korssting* ]<sub>i</sub> hvem kan det<sub>i</sub>?  
 sew cross.stitch can I PPI                      sew cross.stitch who can DET  
 ‘I can do cross stitch.’                              ‘Who can do cross stitch?’

- XP topicalization

○ XP<sub>i</sub> ... \_\_\_<sub>i</sub>  


- Evidence for **movement**: XP is associated with a gap, connectivity effects, island sensitivity.

- XP left dislocation

○ XP<sub>i</sub> ... pronoun<sub>i</sub>  


- Evidence for **movement**: connectivity effects, island sensitivity. (e.g., Cinque 1977, Dobrovie-Sorin 1990, Mahajan 1990, Kayne 1994, Sportiche 1996)
- Evidence for **base generation**: XP is associated with a pronoun, certain differences from other A' movements. (e.g., Cinque 1990, Iatridou 1994, Anagnostopoulou 1994)

- We show that VPLD in Danish involves a particular type of movement that
  - involves adjunction of the left-dislocated VP to the host CP (section 2);
  - displays connectivity and reconstruction effects, and sensitivity to islands (section 3);
  - involves one-fell-swoop rather than successive cyclic movement (section 4).
- The movement in VPLD interacts with two pressures on Chain Reduction (section 1):
  1. to delete a low movement-derived occurrence of a syntactic object;
  2. to not delete a low occurrence if its content is “unrecoverable”, where **structural proximity is a precondition for recoverability**.
- The movement in VPLD is “too long” and renders the low VP occurrence unrecoverable, yielding resumption as in (3); contrast with VPT in (4).

(3) VPLD: [CP VP<sub>2</sub> [CP ... C ... VP<sub>1</sub> ] ] ⇒ [CP VP<sub>i</sub> [CP ... C ... pronoun<sub>i</sub> ] ]  


(4) VPT: [CP VP<sub>2</sub> C ... VP<sub>1</sub> ] ⇒ [CP VP<sub>i</sub> C ... \_\_\_<sub>i</sub> ]  


## 1 Chain Reduction and PF recoverability

- Competing pressures on Chain Reduction:
  - (5) *Economy of Pronunciation* (adapted from Landau 2006:30)  
Mark an occurrence of an element X for non-pronunciation if it is c-commanded by another occurrence of X.
  - (6) *P-Recoverability* (Landau 2006:31)  
An element X in position P cannot be unpronounced if P is required to be associated with phonological content.
- PF conditions that may require a position to be associated with phonological content:
  - (7)
    - a. requirement for bound morphology to have a host  
(e.g., Landau 2006, Sichel 2014, Scott 2018)
    - b. requirement for intonational events to be anchored to phonological material  
(e.g., Landau 2006, Kandybowicz 2007, Sturgeon 2008, Grimberg 2017)
    - c. other phonological well-formedness requirements (e.g. “phonological EPP”)  
(e.g., Holmberg 2000, Landau 2007, Sigurðsson 2010, Richards 2016, van Urk to appear)
- PF condition relevant for VPLD in Danish:
  - d. *Phasemate condition on association with phonological content*  
Position P, occupied by an element X, must be associated with phonological content if there is no higher occurrence of X contained in P’s phasemate domain.
- Given
  - i. a position P,
  - ii. a phase head Y, the closest phase head to P that c-commands P, and
  - iii. a phase head Z, the closest phase head to P that P c-commands,

the phasemate domain of P contains the material dominated by YP and not dominated by the complement of Z.<sup>1</sup> (cf. Chomsky’s (2001) Phase Impenetrability Condition)
- (8)  $[_{YP} \text{ adjunct } \underbrace{[_{YP} \text{ spec } Y [ \dots [_{ZP} \text{ adjunct } [_{ZP} \text{ spec } Z [ \dots ] ] ] ] ] ] ] ] ] ]$   
phasemate domain of P, a position between Y and Z
- Crucial for our purposes is that, according to (7d), specifiers of YP but **not** adjuncts to YP are contained in the phasemate domain of any position between Y and Z.
- If A is adjoined to B, as in (9), A is not dominated by the multisegment category B; an element is dominated by a category only if it is dominated by all of its segments.<sup>2</sup>  
(May 1985:57, Chomsky 1986:7)
- (9)  $[_B A [_B \dots ] ]$

<sup>1</sup>If there is no such Y or Z, the phasemate domain of P extends to the top or bottom of the tree, respectively.

<sup>2</sup>We assume dominance is irreflexive, asymmetric, and transitive (PROPER DOMINANCE; Barker and Pullum 1990:2).

### 1.1 VP left dislocation

- If movement of an XP crosses a phase head without stopping off in its specifier, P-recoverability (6) and the Phasemate Condition (7d) collectively force a reduced realization of the lower occurrence of XP.

- Consider the derivation of VP left dislocation in Danish:

1. Left dislocation: the VP moves to adjoin to the host CP in one fell swoop (Syntax)

$$(10) \quad [_{CP} VP_2 [_{CP} \dots C \dots VP_1 ] ]$$

2. Chain Reduction (PF)

- Economy of Pronunciation (5) marks  $VP_1$  for non-pronunciation (because  $VP_1$  is c-commanded by  $VP_2$ );
- complete non-pronunciation of  $VP_1$  is prevented by P-recoverability (6) and the Phasemate Condition (7d) (because  $VP_2$  is not contained in  $VP_1$ 's phasemate domain).  
(see, e.g., Pesetsky 1998, Landau 2006, van Urk to appear on how pressures on CR interact)

$$(11) \quad [_{CP} VP_2 \underbrace{[_{CP} \dots C \dots VP_1 ]}_{\text{phasemate domain of } VP_1}] \Rightarrow [_{CP} VP_i [_{CP} \dots C \dots det_i ] ]$$

- This conflict between (5) and (6) is resolved by spelling out as little as possible of  $VP_1$ . How much that is is determined by what the smallest pronounceable piece of a VP is. In Danish, *det* can spell out just the information that VP is a maximal projection.<sup>3</sup>

### 1.2 VP topicalization

- If movement of an XP targets the specifier of a phase head instead, Economy of Pronunciation (5) forces deletion of the lower occurrence of XP in its entirety.
- Consider the derivation of VP topicalization in Danish:

1. Topicalization: the VP moves to Spec,CP (Syntax)

$$(12) \quad [_{CP} VP_2 C \dots VP_1 ]$$

2. Chain Reduction (PF)

- Economy of Pronunciation (5) marks  $VP_1$  for non-pronunciation;
- complete non-pronunciation of  $VP_1$  is **not** prevented by P-recoverability (6) (because  $VP_1$  is P-recoverable for the purposes of the Phasemate Condition (7d)).

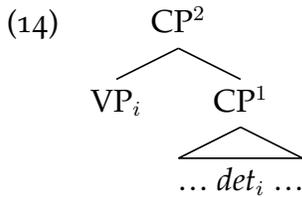
$$(13) \quad \underbrace{[_{CP} VP_2 C \dots VP_1 ]}_{\text{phasemate domain of } VP_1} \Rightarrow [_{CP} VP C \dots \_ ]$$

- Since there is no conflict between (5) and (6),  $VP_1$  is unpronounced in its entirety.

<sup>3</sup>In addition to VPs, *det* can also resume CPs, nonverbal predicates, bare NP arguments, certain adverbials, as well as neuter-gender DPs (the 3<sup>SG</sup> neuter pronoun is *det*). Other phrase types are resumed by more highly specified proforms (Hansen and Heltoft 2011:1828). We are not yet in a position to provide a precise featural analysis of all resumptive elements in Danish that explains why other phrase types are not resumed by *det* but our hypothesis is that *det* is the least specified among these resumptive elements and thus the elsewhere case.

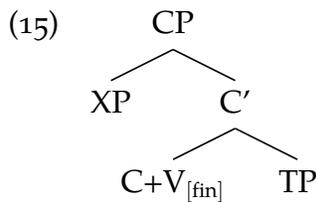
## 2 The left-dislocated VP is an adjunct to CP

- The left-dislocated VP is adjoined to the host clause CP, which is a two-segment category:

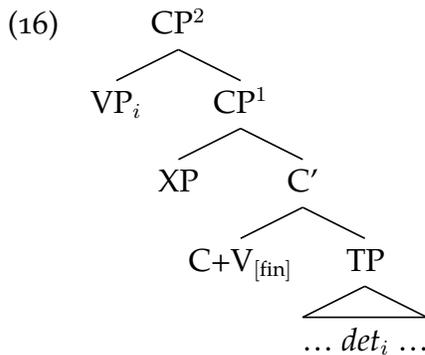


### 2.1 Verb-third order

- Danish root clauses are characterized by verb-second (V2) order, analyzed as (i) movement of the finite verb to C, and (ii) movement of some XP to Spec,CP:



- Given the adjunction structure in (14), we expect VPLD in a root clause as in (15) to result in V3 order, since the V2 root clause CP serves as the host of adjunction:

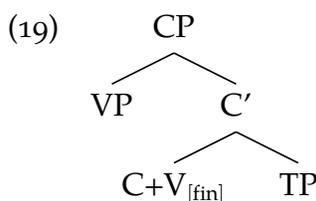


- This expectation is borne out: VPLD results in V3 order.

(Houser et al. 2011:282, Mikkelsen 2011:88)

- |   |   |
|---|---|
| <p>(17) a. <i>Sy korssting, hvem kan det?</i><br/>         sew cross.stitch who can DET<br/>         'Who can do cross stitch?'<br/>         b. *<i>Sy korssting, kan hvem det?</i><br/>         sew cross.stitch can who DET</p> | <p>(18) a. <i>Sy korssting, det kan jeg.</i><br/>         sew cross.stitch DET can I<br/>         'I can do cross stitch.'<br/>         b. *<i>Sy korssting, kan jeg det.</i><br/>         sew cross.stitch can I DET</p> |
|---|---|

- In contrast, we expect VPT in a root clause as in (15) to result in V2 order, since the topicalized VP moves to Spec,CP:



- This expectation is also borne out: VPT results in V2 order.

(20) * <i>Sy korssting hvem kan?</i> sew cross.stitch who can Intended: ‘Who can do cross stitch?’	(21) a. <i>Sy korssting kan jeg godt.</i> sew cross.stitch can I PPI ‘I can do cross stitch.’ b. * <i>Sy korssting jeg kan.</i>
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- Left-dislocated XPs are syntactically “separated” from the host clause crosslinguistically. (e.g., Torrego 1984 on Spanish, Sturgeon 2008 on Czech, Ott 2015 on German )

## 2.2 Prosody

- A left-dislocated phrase in Danish is followed by a pause (orthographically represented by a comma). (Hansen and Heltoft 2011:1840, Tøndering 2008:125)

(22) <i>Holde vagt ved slottet, det kan en almindelig hund ikke.</i> keep guard by the.castle DET can an ordinary dog not ‘An ordinary dog can’t guard the castle.’
---

- This signals a Phonological Phrase (PhP) boundary between the left-dislocated phrase and the host clause. (Tøndering 2008:99-104)

(23) (PhP <i>holde vagt ved slottet</i> ) (PhP <i>det kan en almindelig hund ikke</i> )
---

- The adjunction structure in (14) provides a straightforward explanation of this in terms of Match Theory (e.g, Selkirk 2011) where a PhP matches a syntactic XP (CP, in this case):

(24) [CP [VP ... ] [CP ... ] ] (PhP ) (PhP )
---

- In contrast, a topicalized phrase is not characterized by a following pause:<sup>4</sup>

(25) <i>Holde vagt ved slottet kan en almindelig hund ikke.</i> keep guard by the.castle can an ordinary dog not ‘An ordinary dog can’t guard the castle.’
--

- The absence of a pause is assumed to signal the absence of a prosodic boundary between the topicalized phrase and the host clause:

(26) (PhP <i>holde vagt ved slottet kan en almindelig hund ikke</i> )
---

- Match Theory induces no Phonological Phrase boundary after a topicalized phrase because it occupies Spec,CP and is not followed by an XP but by X’:

(27) [CP [VP ... ] [C’ ... ] ] (PhP )
--

- Left-dislocated XPs are prosodically “separated” from the host clause crosslinguistically. (e.g., Cheng and Downing 2009 on Zulu, Deal 2016 on Nez Perce, Guentchéva 2008 on Bulgarian, Ott 2015 on German, Rizzi 1997 on Italian, Sturgeon 2008 on Czech, Thráinsson 2007 on Icelandic, Zaenen 1997 on Germanic )

<sup>4</sup>To be clear: we are not claiming that a topicalized phrase cannot be followed by a pause. It clearly can be, but it is not characterized by a pause the way a left-dislocated phrase is. One specific hypothesis that deserves to be tested empirically is that the more material a topicalized phrase contains, the more likely it is to be followed by a pause. Thanks to John Tøndering for helpful discussion of these issues.

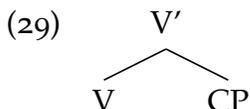
### 2.3 VP left dislocation in embedded clauses

#### (28) Adjunction Prohibition Condition

No adjunction to a phrase which is s-selected by a lexical (open class) head.

(Chomsky 1986, McCloskey 2006, Schwartz and Vikner 1996 on Germanic)

- Given the adjunction structure in (14), we expect VPLD to be prohibited in embedded clauses that are s-selected by a matrix verb, like the CP complement to V in (29).



- This expectation is borne out:

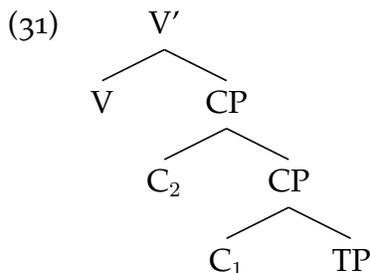
(30) a. *Han siger de godt kan sy korssting.*  
 he says 3PL PPI can sew cross.stitch

'He says they can sew cross stitch.'

b. \**Han siger sy korssting, de godt kan det*  
 he says sew cross.stitch 3PL PPI can DET

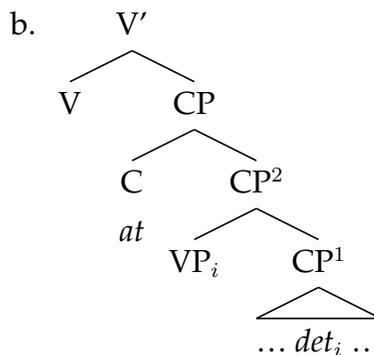
- We expect VPLD to be possible in an embedded CP **not** s-selected by a lexical head, such as the inner CP in a CP-recursion structure, as proposed in accounts of embedded V2:

(e.g., Vikner 1995, Nyvad et al. 2017)



- This expectation is also borne out: embedded VPLD depends on CP recursion.

(32) a. *Han siger at sy korssting, det*  
 he says that sew cross.stitch DET  
*kan de godt.*  
 can they PPI  
 'He says that they can sew cross  
 stitch.'



- (32b) does not violate (28) because the CP host is not s-selected by a lexical head.

- In contrast, VPLD to the outer CP in (31) is impossible:

(33) \**Han siger sy korssting, at det kan de godt.*  
 he says sew cross.stitch that DET can they PPI  
 'He says that they can sew cross stitch.'

### 3 VP left dislocation involves movement

- Evidence that VPLD involves movement:<sup>5</sup>
  - inflectional connectedness;
  - reconstruction effects;
  - sensitivity to certain islands.

#### 3.1 Inflectional connectedness (Mikkelsen 2011:86-87)

- Each auxiliary determines the inflection of the following verbal element:

- (34) a. *De má hafa gem-t den godt.*  
 they must.PRES have-INF hide-PPC it PPI  
 ‘They must have hidden it.’
- b. *Jeg tror nu ikke de kan overtal-e banken.*  
 I think now not they can.PRES persuade-INF the.bank  
 ‘I don’t think they can persuade the bank.’

- the verb in a left-dislocated VP bears the same inflection it would in-situ:

- (35) a. *Gem-t den særligt godt, det tror jeg nu ikke de har.*  
 hide-PPC it particularly well DET think I now not they have.PRES  
 ‘I don’t think they have hidden it very well.’
- b. *Overtal-e banken, det tror jeg nu ikke de kan.*  
 persuade-INF the.bank DET think I now not they can.PRES  
 ‘I don’t think they can persuade the bank.’

#### 3.2 Reconstruction for binding (Houser et al. 2011:286-287)

- Principle A

- (36) [*Forsvare sig(selv)<sub>i</sub> overfor de store børn,*] *det kan Peter<sub>i</sub> godt*  
 defend self over.for the big kids DET can Peter PPI  
 ‘Peter<sub>i</sub> can defend himself<sub>i/\*j</sub> against the big kids.’

- Principle B

- (37) \* [*Forsvare ham<sub>i</sub> overfor de store børn,*] *det kan Peter<sub>i</sub> godt*  
 defend him over.for the big kids DET can Peter PPI  
 ‘Peter<sub>i</sub> can defend him<sub>j/\*i</sub> against the big kids.’

- Principle C

- (38) \* [*Forsvare Peter<sub>i</sub> over for de store børn,*] *det kan han<sub>i</sub> godt*  
 defend Peter over for the big kids DET can him PPI  
 ‘He<sub>j/\*i</sub> can defend Peter<sub>i</sub> against the big kids.’

<sup>5</sup>Houser et al. (2011) also discuss (p. 287-289) parasitic gaps and crossover as possible diagnostics for movement in VPLD, and the confounds that render them inconclusive.

### 3.3 Island effects

#### 3.3.1 Coordinate Structure Constraint

- Coordinate structures are islands in Danish.
  - No VPLD out of coordinate structures, as expected if VPLD involves movement: (Houser et al. 2011:284-286)
- (39) a. [ *Sy korssting og strikke strømper*, ] *hvem kan egentlig det nu om dage?*  
 sew cross.stich and knit socks who can actually DET now about days  
 ‘Do cross stitch and knit socks, who can do that these days?’
- b. \* *Sy korssting, hvem kan egentlig [ det og strikke strømper ] nu om dage?*  
 sew cross.stich who can actually DET and knit socks now about days
- c. \* *Strikke strømper, hvem kan [ sy korssting og det ] nu om dage?*  
 knit socks who can sew cross.stich and DET now about days
- For comparison, anaphora out of coordinate structures is well-formed:
- (40) *Peter<sub>i</sub> bor for enden af vejen, så [ ham<sub>i</sub> og mig ] leger tit sammen.*  
 Peter lives at the.end of the.street so him and me play often together  
 ‘Peter<sub>i</sub> lives at the end of the road so him<sub>i</sub> and I often play together.’

#### 3.3.2 Embedded V2 clauses

- Embedded V2 clauses in Danish are islands (Nyvad et al. 2017).
  - No VPLD out of embedded V2 clauses, as expected if VPLD involves movement:<sup>6</sup>
- (41) \* *Sy korssting, hvem tror [ at det kan jeg godt ] ?*  
 sew cross.stich who thinks that DET can I PPI  
 ‘Who thinks that I can sew cross stitch?’
- (42) \* *Sælge gården, hvem tror [ at næste år vil han det ] ?*  
 sell the.farm who think that next year will he DET  
 ‘Who thinks that he will sell the farm next year?’
- For comparison, anaphora out of an embedded V2 clause is well-formed:
- (43) *Jeg leger tit med Peter<sub>i</sub>, men Louise siger [ at ham<sub>i</sub> gider hun ikke lege med ].*  
 I play often with Peter but Louise says that him is.bothered she not play with  
 ‘I often play with Peter<sub>i</sub>, but Louise says that she doesn’t want to play with him<sub>i</sub>.’
- (44) *Jeg vil gerne lege med Peter<sub>i</sub> igen, men Louise siger [ at næste gang gider hun ikke lege med ham<sub>i</sub> ].*  
 I will PPI play with Peter again but Louise says that next time is.bothered she  
 not play with him  
 ‘I’d like to play with Peter<sub>i</sub> again, but Louise says that she doesn’t want to play with him<sub>i</sub> next time.’

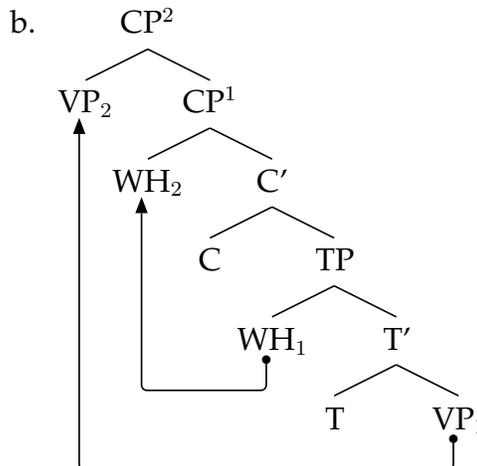
<sup>6</sup>VPLD is possible out of embedded non-V2 clauses: see section 4.2.

## 4 Movement in VP left dislocation is direct

### 4.1 VPLD within a single clause

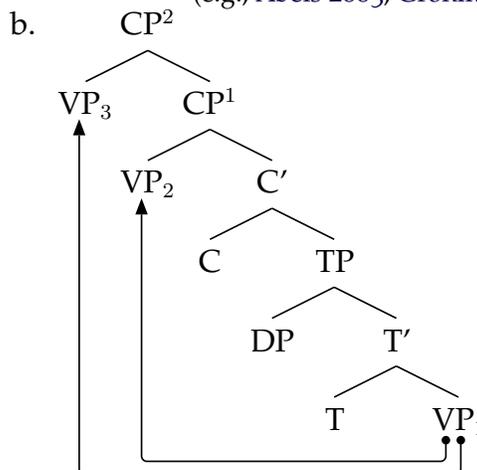
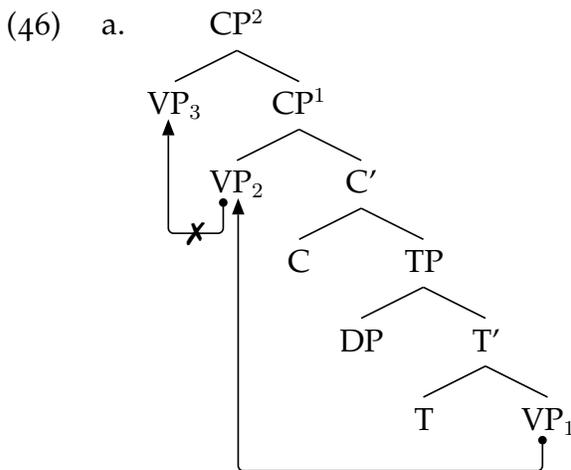
- The movement of the left-dislocated VP to an adjoined-to-CP position **can** be direct, since movement of the VP can cross a Spec,CP occupied by another element:

(45) a. *Sy korssting, hvem kan det?*  
 sew cross.stitch who can DET  
 “Who can do cross stitch?”



- The movement of the left-dislocated VP to an adjoined-to-CP position **must** be direct, since movement of the VP from Spec,CP to an adjoined-to-CP position is “too local”:

(e.g., Abels 2003, Grohmann 2003)



- The direct movement derivation in (46b) results in the spell out of *det* in Spec,CP:

(47) *Sy korssting, det kan jeg godt.*  
 sew cross.stitch DET can I PPI  
 ‘I can do cross stitch.’

- This cannot be due to the Phasemate Condition (7d) because VP<sub>3</sub> in (46b) is contained in VP<sub>2</sub>’s phasemate domain and, therefore, VP<sub>2</sub> is P-recoverable for the purposes of (7d).<sup>7</sup>
- However, VP<sub>2</sub> in (46b) is **not** P-recoverable for the purposes of a requirement of type (7c): C in (46b) bears a phonological EPP feature that demands its specifier be associated with phonological material, thereby ensuring V2 order within CP<sup>1</sup>.

<sup>7</sup>Thanks to Emily Clem and Amy Rose Deal for helpful discussion of these issues.

## 4.2 VPLD across clausal boundaries

- It is possible for an embedded VP to undergo long-distance VPLD out of an embedded non-V2 clause to an adjoined-to-CP position; if the matrix Spec,CP is occupied, *det* surfaces in the CP of origin:

(48) *Sy korssting, hvem tror (at) jeg godt kan det?*  
 sew cross.stitch who thinks that I PPI can DET  
 ‘Who thinks that I can do cross stitch?’

(49) a.  $[_{CP} VP_2 [_{CP} WH C \dots V [_{CP} (C_{at}) \dots Aux VP_1 ] ] ]$  (Syntax)

b.  $[_{CP} VP_i [_{CP} WH C \dots V [_{CP} (C_{at}) \dots Aux det_i ] ] ]$  (PF)

- It is also possible for an embedded VP to undergo long-distance VPT to the matrix Spec,CP (by successive cyclic movement) and VPLD (by direct movement); in this case, the result is resumption in the CP that hosts VPLD:

(50) *Sy korssting, det tror de (at) jeg godt kan.*  
 sew cross.stitch DET think they that I PPI can  
 ‘They think that I can do cross stitch.’

(51) a.  $[_{CP} VP_4 [_{CP} VP_3 C \dots V [_{CP} VP_2 (C_{at}) \dots Aux VP_1 ] ] ]$  (Syntax)

b.  $[_{CP} VP_i [_{CP} det_i C \dots V [_{CP} \_i (C_{at}) \dots Aux \_i ] ] ]$  (PF)

- It is **impossible** for an embedded VP to move successive cyclically part of the way and directly the rest of the way, with resumption in the intermediate Spec,CP:

(52) \**Sy korssting, hvem tror det (at) jeg godt kan?*  
 sew cross.stitch who thinks DET that I PPI can  
 ‘Who thinks that I can do cross stitch?’

(53) a.  $[_{CP} VP_3 [_{CP} WH C \dots V [_{CP} VP_2 (C_{at}) \dots Aux VP_1 ] ] ]$  (Syntax)

b.  $[_{CP} VP_i [_{CP} WH C \dots V [_{CP} det_i (C_{at}) \dots Aux \_i ] ] ]$  (PF)

- The reason for this is that the intermediate  $C_{at}$  bears an OCCURRENCE feature that
  - enables extraction out of its complement, but
  - prohibits spell-out of its specifier.

(Chomsky 2004:24, Nyvad et al. 2017:449 on Danish; see also McCloskey 2002)

## 5 Conclusion

- Danish VPLD is one-fell-swoop movement to an adjoined-to-CP position;
- this movement profile combined with P-recoverability results in resumption.

## Abbreviations

1, 2, 3 – person, SG – singular, PL – plural, INF – infinitive, PAST – past, PPC – past participle, PPI – positive polarity item, PRES – present.

## Acknowledgments

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