Person Case Constraints and Feature Complexity in Syntax

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What is the PCC?

Person Case Constraint (PCC)

Whether the direct object (DO) and the indirect object (IO) of a clause can both be cliticized is contingent on the person specification of DO and IO.

(1)	Roger	**me/le*	*leur*	a	presésenté.
	Roger	1SG/3SG.ACC	3PL.DAT	has	shown

‘Roger has shown me/him to them.’

Questions & Goals

- What are the descriptive properties of PCCs?
  ⇒ algebraic unification in terms of presemilattices
- Can those properties be tied to independently motivated linguistic assumptions? ⇒ connection to feature geometry

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1. Person Case Constraints: An Overview
   - PCC Typology
   - Previous Proposals
2. Characterizing the Class of PCCs
   - The Generalized PCC
   - Algebraic Characterization via Person Locality
3. Connection to Feature Complexity
   - Reducing Person Locality to Feature Complexity
   - Reducing Feature Complexity to Feature Geometries
4. Another Look at the G-PCC

The PCC: A Closer Look

- attested in a variety of languages, including French, Spanish, Catalan, and Classical Arabic (Kayne 1975; Bonet 1991, 1994)
- specifics of PCC differ between languages, dialects, idiolects

Four Attested PCC Variants

- **Strong PCC** (S-PCC; Bonet 1994)
  DO must be 3.
- **Ultrastrong PCC** (U-PCC; Nevins 2007)
  DO is less local than IO (where $3 < 2 < 1$).
- **Weak PCC** (W-PCC; Bonet 1994)
  3IO combines only with 3DO.
- **Me-first PCC** (M-PCC; Nevins 2007)
  If IO is 2 or 3, then DO is not 1.

The Four PCC Variants (Walkow 2012)

IO↓/DO→	1	2	3
1	NA	*	✓
2	*	NA	✓
3	*	*	NA

(a) S-PCC

IO↓/DO→	1	2	3
1	NA	✓	✓
2	*	NA	✓
3	*	*	NA

(b) U-PCC

IO↓/DO→	1	2	3
1	NA	✓	✓
2	✓	NA	✓
3	*	*	NA

(c) W-PCC

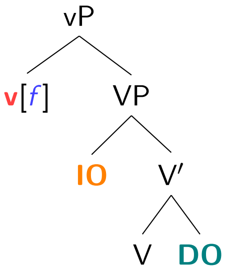
IO↓/DO→	1	2	3
1	NA	✓	✓
2	*	NA	✓
3	*	✓	NA

(d) M-PCC

The PCC in Minimalism

- Variety of proposals, work well empirically:
    - Anagnostopoulou (2005)
    - Nevins (2007)
    - Béjar and Rezac (2009)
    - Walkow (2012)
- **Shared Idea:** PCCs epiphenomenal, arise from more basic **restrictions on the Agree operation**
- **Conceptual Drawbacks**
    - non-standard Agree mechanisms
    - highly specific assumptions about feature system
    - technical, complex
    - hard to determine which assumptions are really needed

Example: Intuition Behind Nevins (2007)



- v needs to agree with a particular feature *f*
- a search domain is established, depending on the type of *f*
- ungrammatical if the domain contains DO but not IO
- v agrees with both DO and IO ⇒ IO and DO must have the same value for *f*

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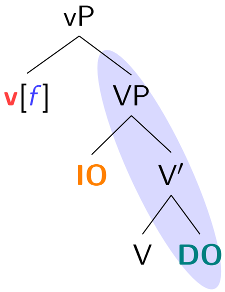

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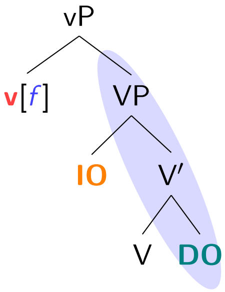

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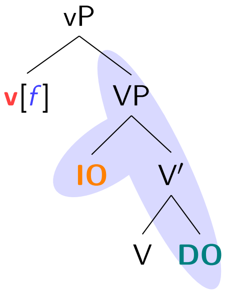

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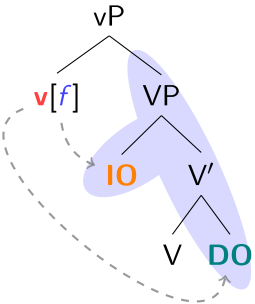

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Example: Assumptions of Nevins (2007)

- **Operations**
  - Agree steps happen concurrently
  - constraints on search domain
  - matching condition on IO and DO
- **Structure**
  - clitics are PF-realization of Agree
  - IO structurally higher than DO
- **Features**
  - features are binary valued
  - novel definition of contrastive features
  - feature values can be marked or unmarked
  - specific feature decomposition of person:

Person	Feature Matrix
1	[+author,+participant]
2	[-author,+participant]
3	[-author,-participant]

Evaluation

- Previous accounts work on an empirical level.
- They are complex because they try to do two things at once:
  1. enforce the PCC with Minimalist machinery,
  2. capture the attested typology.
- But that's more ambitious than necessary!

The Secret Power of Merge (Graf 2011; Kobele 2011)

Every syntactic constraint that can be computed with a finite amount of working memory can be enforced purely via Merge.

- The PCCs can be enforced by Merge, we do not need to extend our framework at all.
- The big issue is Point 2: There are $2^6 = 64$ logically possible PCC variants. **Why do we find only 4 PCCs**?

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The Generalized PCC

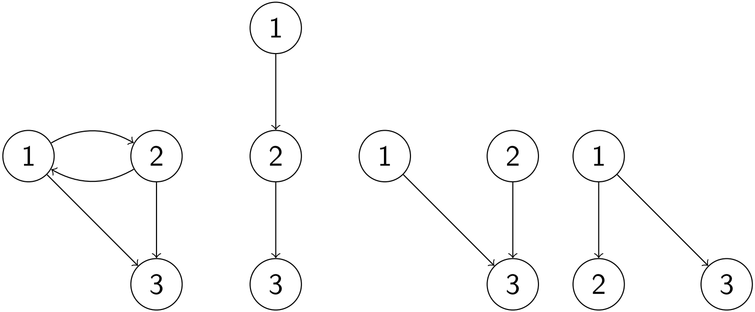
The U-PCC was defined in terms of person locality.
This system can be extended to all four PCC-types.

Generalized PCC (G-PCC)

IO is not less local than DO (IO $\not<$ DO), where

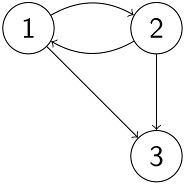
S-PCC:	$1 > 2$	$1 > 3$	$2 > 1$	$2 > 3$
U-PCC:	$1 > 2$	$1 > 3$		$2 > 3$
W-PCC:	$1 > 3$			$2 > 3$
M-PCC:	$1 > 2$	$1 > 3$		

Person Locality Hierarchies



(a) S-PCC (b) U-PCC (c) W-PCC (d) M-PCC

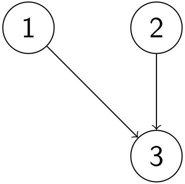
Example 1: S-PCC



$1 > 2$
$1 > 3$
$2 > 1$
$2 > 3$

IO↓/DO→	1	2	3
1	NA	*	✓
2	*	NA	✓
3	*	*	NA

Example 2: W-PCC



$1 > 3$

$2 > 3$

IO↓/DO→	1	2	3
1	NA	✓	✓
2	✓	NA	✓
3	*	*	NA

Presemilattices

The G-PCC gives a unified description of the four PCCs,
but we could have drawn any kind of graph.
What makes the previous four structures so special?

First, they are all **presemilattices** (Plummer and Pollard 2012).

Definition (Presemilattices for Linguists)

A structure S is a **presemilattice** iff for all nodes u and v of S, there is some node t such that

- t "reflexively dominates" u and v, or
- u and v "reflexively dominate" t.

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Two More Restrictions

The number of presemilattices with three nodes is still more than 4. We have to stipulate two more properties:

Top and Bottom

Top For all x, $1 < x$ implies $x < 1$.
'Every person feature is at most as local as 1.'

Bottom There is no $x \neq 3$ such that $x < 3$.
'No person feature is less local than 3.'

Unifying the PCCs

The class of attested PCCs is given by

- the G-PCC IO $\not<$ DO such that
- $<$ defines a presemilattice $\mathcal{P}$ over $\{1, 2, 3\}$, and
- $\mathcal{P}$ respects both Top and Bottom.

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Top and Bottom Match Feature Complexity

Top and Bottom are stipulations, but express a common intuition: 1 is “maximally complex”, 3 “minimally complex”.

Example 1: Person Specifications in Nevins (2007)

Person	**Specification**
1	[+author,+participant]
2	[-author,+participant]
3	[-author,-participant]

Example 2: Alternative Specification a la Nevins (2007)

Person	**Specification**
1	{participant,author}
2	{participant}
3	{}

Doing Away with Top and Bottom?

Syntactic proposals use feature geometry to derive PCC typology. Can we do the same? Yes, and No.

Algebraic Feature Complexity [Idea Sketch]

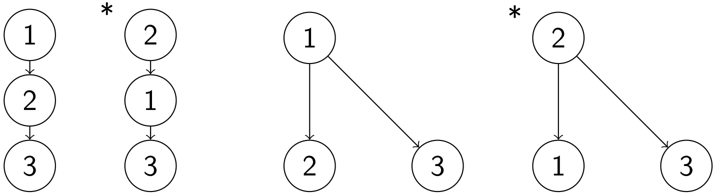
PCC locality is partially determined by feature complexity:

- Person features are ordered by their internal complexity $\Rightarrow$ algebraic structure $\mathcal{C}$
- PCC locality rankings are exactly those structures that
  - can be obtained from $\mathcal{C}$ by a map f such that
  - f preserves certain properties of $\mathcal{F}$

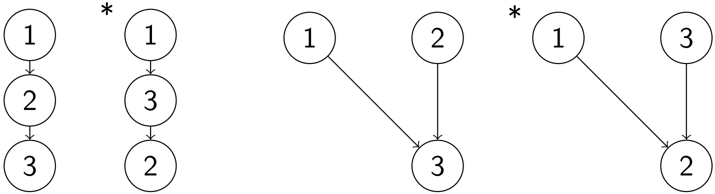
The above is feasible, but more stipulative than one would expect.

What does $\mathcal{C}$ Look Like?

- $\mathcal{C}$ must assign different complexity to 1 and 2:

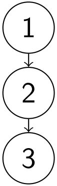


- $\mathcal{C}$ must assign different complexity to 2 and 3:



The Only Viable Shape of $\mathcal{C}$

- The previous arguments entail that $\mathcal{C}$ must be



- The 4 PCCs are generated from $\mathcal{C}$ by those maps that
  - **preserve maximality** ($\approx$ Top)
  - **preserve lack of daughter nodes** ($\approx$ Bottom)
- But where does $\mathcal{C}$ come from? Can we obtain this complexity ranking from feature geometries?

Obtaining $\mathcal{C}$ from Feature Geometries

$\mathcal{C}$ is easily obtained from the feature specification in Nevins (2007) if person complexity is determined by the number of features.

Reminder: Set-Theoretic Specification a la Nevins (2007)

Person	Specification
1	{participant,author}
2	{participant}
3	{}

This counting measure also works for the following specifications:

Example: Specification with Distinguished Feature for 3

Person	Specification
1	{participant,author,non-addressee}
2	{participant,addressee}
3	{non-participant}

Another Feature Geometry: Harley and Ritter (2002)

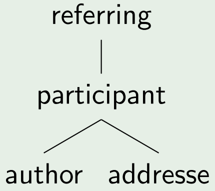
- Without restrictions on what counts as a complexity measure, any feature geometry can be the basis for $\mathcal{C}$.
- But **some feature geometries are compatible with more complexity measures** than others.

Example: Harley and Ritter (2002) Needs a Weighted Measure

1 and 2 are structurally equivalent in Harley and Ritter (2002): same number of features, same structural representation

$\Rightarrow$ features must be weighted

Person	Specification
1	{ref,part,auth}
2	{ref,part,addr}
3	{ref}



Interim Summary

- The four PCC structures can be tied to feature geometries, but we need
  - a complexity measure that obtains $\mathcal{C}$ from the geometry, and
  - stipulations on how $\mathcal{C}$ restricts the class of PCC structures.
- In isolation there's many possible solutions, so at this point we cannot narrow things down further without looking at new data (gender, number, animacy).

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Maybe our problem with reducing the PCCs to feature geometries is due to our peculiar choice of G-PCC?

Spoiler

It is not.

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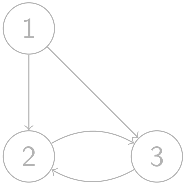
Typology with Other Constraints

	a	b	c	d
IO $\not<$ DO	S	U	W	M
DO $<$ IO	W	U	S	M2

Me-second PCC (M2-PCC): If there is a DO, IO must be 1. [unattested]

- Under IO $\not<$ DO, M2-PCC is given by



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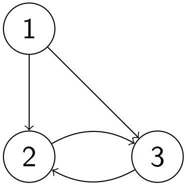

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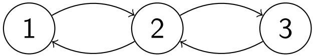

Typology with Additional Structures

	a	b	c	d	e	f
IO $\not<$ DO	S	U	W	M	M2	I
DO $<$ IO	W	U	S	M2	M	N

Indiscriminate PCC (I-PCC): No IO-DO clitic combinations. [Cairene Arabic (Shlonsky 1997:207, Walkow p.c.)]

Null PCC (N-PCC): Any clitic combination.

Typology with Additional Structures

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The Full Extended Typology

	a	b	c	d	e	f
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DO $<$ IO	W	U	S	M2	M	N
IO $<$ DO	W	U	S	M2	M	N
DO $\not<$ IO	S	U	W	M	M2	I

Implications

- Choice of G-PCC has minor effect on predicted PCC typology.
- Allowing structures e and f requires a change to Bottom/Preservation of lack of daughters.
- However, the complexity ranking $\mathcal{C}$ stays the same
  $\Rightarrow$ problem of linking $\mathcal{C}$ to feature geometry unchanged.

The Full Extended Typology

	a	b	c	d	e	f
IO $\nless$ DO	S	U	W	M	M2	I
DO $<$ IO	W	U	S	M2	M	N
IO $<$ DO	W	U	S	M2	M	N
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Technical Summary

- Fairly natural algebraic characterization of the attested PCCs:
  - a ban against specific person locality configurations (G-PCC),
  - locality structures must be presemilattices,
  - locality structures respect both Top and Bottom.
- Going one level deeper:
  - person complexity must be $1 > 2 > 3$,
  - person complexity restricts shape of locality structures (stipulative right now, but algebraically fairly natural).
- Going down another level:
  - person complexity determined by feature geometry
  - no obvious natural link at this point, but some geometries derive person complexity more easily

What's Next

- At this point there's too many algebraic solutions.
- We need to look at morphosyntax beyond person, i.e. number, gender, animacy.
- Ideally, all phenomena will follow naturally from a given feature geometry if all parameters have been fixed (mapping from feature geometry to complexity structures, mappings from complexity structures to locality structures).

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