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 presénté.

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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  ⇒ algebraic unification in terms of presemilattices

- Can those properties be tied to independently motivated linguistic assumptions?
  ⇒ connection to feature geometry
# Outline

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**
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

<table>
<thead>
<tr>
<th>Four Attested PCC Variants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strong PCC</strong> (S-PCC; Bonet 1994)</td>
</tr>
<tr>
<td>DO must be 3.</td>
</tr>
<tr>
<td><strong>Ultrastrong PCC</strong> (U-PCC; Nevins 2007)</td>
</tr>
<tr>
<td>DO is less local than IO (where 3 &lt; 2 &lt; 1).</td>
</tr>
<tr>
<td><strong>Weak PCC</strong> (W-PCC; Bonet 1994)</td>
</tr>
<tr>
<td>3IO combines only with 3DO.</td>
</tr>
<tr>
<td><strong>Me-first PCC</strong> (M-PCC; Nevins 2007)</td>
</tr>
<tr>
<td>If IO is 2 or 3, then DO is not 1.</td>
</tr>
</tbody>
</table>
The Four PCC Variants (Walkow 2012)

<table>
<thead>
<tr>
<th>IO↓/DO→</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NA</td>
<td>*</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>NA</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>*</td>
<td>*</td>
<td>NA</td>
</tr>
</tbody>
</table>

(a) S-PCC

<table>
<thead>
<tr>
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<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NA</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
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<td>✓</td>
<td>NA</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>*</td>
<td>✓</td>
<td>NA</td>
</tr>
</tbody>
</table>

(b) U-PCC

<table>
<thead>
<tr>
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<th>2</th>
<th>3</th>
</tr>
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<td>1</td>
<td>NA</td>
<td>✓</td>
<td>✓</td>
</tr>
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<td></td>
<td>*</td>
<td>NA</td>
</tr>
<tr>
<td>3</td>
<td>*</td>
<td>✓</td>
<td>NA</td>
</tr>
</tbody>
</table>

(c) W-PCC

<table>
<thead>
<tr>
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<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NA</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>✓</td>
<td>NA</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>*</td>
<td>✓</td>
<td>NA</td>
</tr>
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</table>

(d) M-PCC
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 $\Rightarrow$ IO and DO must have the same value for $f$
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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:

<table>
<thead>
<tr>
<th>Person</th>
<th>Feature Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>[+author, +participant]</td>
</tr>
<tr>
<td>2</td>
<td>[-author, +participant]</td>
</tr>
<tr>
<td>3</td>
<td>[-author, -participant]</td>
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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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4 Another Look at the G-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 $\nless$ 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

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</tr>
<tr>
<td>3</td>
<td>*</td>
<td>*</td>
<td>NA</td>
</tr>
</tbody>
</table>
Example 2: W-PCC

```
1 > 3
2 > 3

IO↓/DO→  1  2  3
1    NA √ √
2    √ NA √
3    *  * NA
```
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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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 $\text{IO} \not\leq \text{DO}$ such that
- $<$ defines a presemilattice $\mathcal{P}$ over $\{1, 2, 3\}$, and
- $\mathcal{P}$ respects both Top and Bottom.
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4. Another Look at the G-PCC
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)

<table>
<thead>
<tr>
<th>Person</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>[+author,+participant]</td>
</tr>
<tr>
<td>2</td>
<td>[-author,+participant]</td>
</tr>
<tr>
<td>3</td>
<td>[-author,-participant]</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Person</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>{participant, author}</td>
</tr>
<tr>
<td>2</td>
<td>{participant}</td>
</tr>
<tr>
<td>3</td>
<td>{}</td>
</tr>
</tbody>
</table>
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 $C$
- PCC locality rankings are exactly those structures that
  - can be obtained from $C$ by a map $f$ such that
  - $f$ preserves certain properties of $F$

The above is feasible, but more stipulative than one would expect.
What does $C$ Look Like?

- $C$ must assign different complexity to 1 and 2:

- $C$ must assign different complexity to 2 and 3:
The Only Viable Shape of $\mathcal{C}$

- The previous arguments entail that $\mathcal{C}$ must be
  
  \[
  \begin{array}{c}
  1 \\
  2 \\
  3 
  \end{array}
  \]

- 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 $C$ from Feature Geometries

$C$ 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)

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>{participant, author}</td>
</tr>
<tr>
<td>2</td>
<td>{participant}</td>
</tr>
<tr>
<td>3</td>
<td>{}</td>
</tr>
</tbody>
</table>

This counting measure also works for the following specifications:

### Example: Specification with Distinguished Feature for 3

<table>
<thead>
<tr>
<th>Person</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>{participant, author, non-addressee}</td>
</tr>
<tr>
<td>2</td>
<td>{participant, addressee}</td>
</tr>
<tr>
<td>3</td>
<td>{non-participant}</td>
</tr>
</tbody>
</table>

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


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

$\Rightarrow$ features must be weighted

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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>{ref,part,auth}</td>
</tr>
<tr>
<td>2</td>
<td>{ref,part,addr}</td>
</tr>
<tr>
<td>3</td>
<td>{ref}</td>
</tr>
</tbody>
</table>

referring

participant

author  addresse
The four PCC structures can be tied to feature geometries, but we need:

- a complexity measure that obtains $C$ from the geometry, and
- stipulations on how $C$ 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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Why IO $\not<\ DO$?

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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

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<thead>
<tr>
<th></th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO ̸&lt; DO</td>
<td>S</td>
<td>U</td>
<td>W</td>
<td>M</td>
</tr>
<tr>
<td>DO &lt; IO</td>
<td>W</td>
<td>U</td>
<td>S</td>
<td>M2</td>
</tr>
</tbody>
</table>

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

- Under IO ̸< DO, M2-PCC is given by

- Weakening Bottom to allow for this structure also brings in
Typology with Other Constraints

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<tbody>
<tr>
<td>IO ≠ DO</td>
<td>S</td>
<td>U</td>
<td>W</td>
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  ![Diagram](image)

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<tr>
<td>DO $&lt;$ IO</td>
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**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

<table>
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<th>f</th>
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<tr>
<td>S</td>
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<td>M</td>
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<td></td>
</tr>
<tr>
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#### 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 $C$ stays the same $\Rightarrow$ problem of linking $C$ to feature geometry unchanged.
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<tr>
<td>IO $&lt;$ DO</td>
<td>W</td>
<td>U</td>
<td>S</td>
<td>M2</td>
<td>M</td>
<td>N</td>
</tr>
<tr>
<td>DO $\not&lt;$ IO</td>
<td>S</td>
<td>U</td>
<td>W</td>
<td>M</td>
<td>M2</td>
<td>I</td>
</tr>
</tbody>
</table>

### 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 $C$ stays the same $\Rightarrow$ problem of linking $C$ to feature geometry unchanged.
## 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
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).


