Accounting for parallels between inverse marking and the PCC

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The Person-Case Constraint (PCC) is a type of person hierarchy effect that holds between objects in a ditransitive.

It has been observed that the PCC shows similarities with another type of person hierarchy effect – inverse marking (Bianchi 2006; Stegovec 2017; Zubizarreta and Pancheva 2017; Hammerly 2020, a.o.).

There has been debate in the literature about whether these two hierarchy effects should be modeled in a unified manner, with some concluding that they should not (Anagnostopoulou 2005; Lochbihler 2007).

I demonstrate that all four widely-recognized varieties of the PCC are paralleled in systems of inverse marking.

These parallels strengthen the argument in favor of a unified treatment.
I offer an extension of Deal's (2021) interaction and satisfaction model of the PCC to inverse marking.

I argue that the empirical difference between the phenomena reflect two key structural differences:

- The height of an agreement probe
- The repair strategies available

Variation in these two parameters predicts two additional types of hierarchy systems, both of which are attested.
The PCC

- The PCC restricts combinations of objects in ditransitives

<table>
<thead>
<tr>
<th>Strong PCC in Greek (Anagnostopoulou 2005:202)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Tha su ton stilune</td>
</tr>
<tr>
<td>FUT 2SG.GEN.CL 3SG.M.ACC.CL send.3PL</td>
</tr>
<tr>
<td>‘They will send him to you.’</td>
</tr>
<tr>
<td>(2) * Tha tu se stilune</td>
</tr>
<tr>
<td>FUT 3SG.M.GEN.CL 2SG.ACC.CL send.3PL</td>
</tr>
<tr>
<td>‘They will send you to him.’</td>
</tr>
</tbody>
</table>

- While the PCC has sometimes been associated only with combinations of pronominal clitics and/or agreement markers, other forms of realizing person also show PCC effects (Ormazabal and Romero 2007; Deal 2021, a.o.)
There are four widely recognized varieties of the PCC: strong, weak, strictly descending (ultrastrong), and me-first.

### Varieties of the PCC

<table>
<thead>
<tr>
<th>IO</th>
<th>DO</th>
<th>Strong</th>
<th>Weak</th>
<th>Strictly descending</th>
<th>Me-first</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>*</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>*</td>
<td>✓</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>✓</td>
</tr>
</tbody>
</table>

Example: Greek, Catalan, Classical Arabic, Romanian
Inverse marking

- Inverse markers are morphemes that appear with certain person combinations of subject and (primary) object.
- We can think of inverse systems as restricting person combinations of subject and object.
- Within the literature on inverse marking, four types of person combinations are generally recognized:
  - Direct: Subject is a speech act participant (SAP), object is third person.
  - Inverse: Subject is third person, object is SAP.
  - Local: Subject and object are SAPs.
  - Non-local: Subject and object are third person.
- There is crosslinguistic variation in which configurations involve inverse marking.
- I will demonstrate that patterns that parallel all four varieties of the PCC are attested in inverse systems.
Potosino Huastec

- Potosino Huastec (Mayan; Mexico) shows ergative alignment in verbal person marking.
- Transitive verbs appear with one person marker that indexes the argument that is highest on the hierarchy 1>2>3.
- With certain combinations of subject and object, the inverse marker /t(V)-/ appears as well (Zavala 1994, 2007).

Huastec direct and inverse configurations (Zavala 1994:59, 71)

(3) Ø-a pijch-iy an burro Ø-u pijch-iy
3.ABS-2SG.ERG feed-TT DEF donkey 3.ABS-1SG.ERG feed-TT
‘Did you feed the donkey? I fed him.’

(4) ani yab Ø che’-nek u aamu ti-k-in
and NEG 3.ABS come-PRF 1SG.ERG boss INV-DEP-1SG.ABS
pijch-iy
feed-TT
‘My boss has not come to feed me.’
Huastec local configurations (Zavala 2007:277)

(5)  
ne’etz beel  **t-u**  tolm-iy  
FUT  anyway INV-1SG.ERG help-TT  
‘I am going to help you.’

(6)  
xoo’ **t-in**  bal-iy  al  an  kw’atzib  
now INV-1SG.ABS take.in-TT LOC DEF nixcón  
‘Now you put me inside the nixcón (cooked corn).’

- The inverse marker appears in all inverse and local configurations
- The object must be third person or else inverse marking is used
- This pattern parallels the strong PCC where the direct object must be third person
Picurís

- Picurís (Tanoan; USA) has three relevant sets of verbal person markers
  - Set I: Objects and intransitive subjects
  - Set IIA: Transitive subjects when both arguments are animate
  - Portmanteaux used in local configurations
- Transitive verbs appear with one person marker that indexes SAP arguments if present
- With certain combinations of subject and object, the inverse marker -mia appears as well (Klaiman 1993)

Picurís direct and inverse configurations (Klaiman 1993:357)

(7) Sënene ti-mǒn-’an
    man    1SG.IIA-see-PST
    ‘I saw the man.’

(8) Ta-mǒn-mia-’an sënene-pa
    1SG.I-see-INV-PST man-OBL
    ‘The man saw me.’
Picurís

<table>
<thead>
<tr>
<th>Picurís local configurations (Klaiman 1993:358)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(9)</td>
</tr>
<tr>
<td>(I)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>(10)</td>
</tr>
<tr>
<td>(you)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

- The inverse marker appears only in inverse configurations
- If there is a third person, the object must be third person or else inverse marking is used
- This pattern parallels the weak PCC where, if there is a third person, the direct object must be third person
Ja’a Kumiai

- Ja’a Kumiai (Yuman; Mexico) allows the person of the subject and the object to be indexed on the verb
- With certain combinations of subject and object, the inverse marker ?- appears as well (Caballero and Cheng 2020)

<table>
<thead>
<tr>
<th>Kumiai direct and inverse configurations (Caballero and Cheng 2020:37)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(11)</em></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><em>(12)</em></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
### Kumiai local configurations (Caballero and Cheng 2020:37)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(13)</td>
<td>&gt;jn-i\n&lt;br&gt;1&gt;2-give&lt;br&gt;‘I give it to you.’</td>
</tr>
<tr>
<td>(14)</td>
<td>&gt;jn-m-ʔ-i\n&lt;br&gt;1.OBJ-2-INV-give&lt;br&gt;‘You give it to me.’</td>
</tr>
</tbody>
</table>

- The inverse marker appears in inverse and 2→1 configurations.
- The subject must outrank the object on the hierarchy 1>2>3 or else inverse marking is used.
- This pattern parallels the strictly descending PCC where the indirect object must outrank the direct object on the hierarchy 1>2>3.
Nez Perce allows both subject and object to be indexed on the verb by a series of prefixes and suffixes.

A -m suffix known as the cislocative (Rude 1985:49) may also appear on the verb:
- This marker has a spatial function indicating movement toward the speaker.
- This marker has an addition function as part of the verbal agreement system.

In its agreement function, the cislocative resembles an inverse marker (Deal 2015b).
• There is variation across doculects in the inverse use of cislocative, and I focus here on the variety documented by Asa Bowen Smith, reported in Hale (1846)

<table>
<thead>
<tr>
<th>Nez Perce direct and inverse configurations (Hale 1846:558)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(15) im a {a-k-sa-m / a-ki-sa} ip-na</td>
</tr>
<tr>
<td>2SG 2SG.CL 3.OBJ-see-IPFV-CIS / 3.OBJ-see-IPFV 3SG-ACC</td>
</tr>
<tr>
<td>‘thou seest him’ (direction towards / direction from)</td>
</tr>
<tr>
<td>(16) ip-nim a {ha-k-sa-m / ha-ki-sa} im-ana</td>
</tr>
<tr>
<td>3SG-ERG 2SG.CL 3.SBJ-see-IPFV-CIS / 3.SBJ-see-IPFV 2SG-ACC</td>
</tr>
<tr>
<td>‘he sees thee’ (direction towards / direction from)</td>
</tr>
<tr>
<td>(17) ip-nim ha-k-sa-m in-a</td>
</tr>
<tr>
<td>3SG-ERG 3.SBJ-see-IPFV-INV 1SG-ACC</td>
</tr>
<tr>
<td>‘he sees me’</td>
</tr>
<tr>
<td>(categorized as direction towards, no direction from form attested)</td>
</tr>
</tbody>
</table>
Nez Perce

Nez Perce local configurations (Hale 1846:558)

(18) in a haki-sa im-ana
    1SG 2SG.CL see-IPFV 2SG-ACC
    ‘I see thee’
    (categorized as direction from, no direction towards form attested)

(19) im a hak-sa-m in-a
    2SG 2SG.CL see-IPFV-INV 1SG-ACC
    ‘thou seest me’
    (categorized as direction towards, no direction from form attested)

• The inverse appears in 3→1 and 2→1 configurations
• If there is a first person, it must be the subject or else inverse marking is used
• This pattern parallels the me-first PCC where, if there is a first person, it must be the indirect object
Varieties of inverse marking

- All four varieties of the PCC are paralleled in varieties of inverse marking

<table>
<thead>
<tr>
<th>IO/S</th>
<th>DO/O</th>
<th>Strong</th>
<th>Weak</th>
<th>Strictly descending</th>
<th>Me-first</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>*/INV</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>*/INV</td>
<td>✓</td>
<td>*/INV</td>
<td>*/INV</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>*/INV</td>
<td>*/INV</td>
<td>*/INV</td>
<td>*/INV</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>*/INV</td>
<td>*/INV</td>
<td>*/INV</td>
<td>✓</td>
</tr>
</tbody>
</table>

PCC Example: Greek, Catalan, Classical Arabic, Romanian
Inverse Example: Huastec, Picurís, Kumiai, Nez Perce

- These parallels motivate a unified treatment of the two phenomena
Differences in probe height

• Syntactic treatments of hierarchy effects have often assumed that these restrictions arise when a single probe agrees (or fails to agree) with multiple goals
  • For the PCC, these goals are the direct and indirect object
  • For inverse systems, these goals are the subject and (primary) object

• I argue that by varying the height of the probe, we can capture the difference in the arguments involved in the PCC vs. inverse marking
  • For the PCC, I assume that the probe is located on $ν$
  • For inverse systems, I assume that the probe is located higher on Voice
The structures

- I assume that the PCC involves a probe on $v$ in a structure where the DO has moved above the IO (Deal 2021)
  - $v$ first agrees with the DO and then with the IO
- I assume that inverse marking involves a probe on Voice between the subject and object
  - Voice first agrees with the object and then with the subject
Differences in repair strategy

- The PCC is often discussed in terms of grammaticality
  - Some combinations of direct and indirect object person marking are grammatical
  - Other combinations are ungrammatical
- Inverse marking is often discussed in terms of providing additional information about the grammatical function of arguments
  - Lack of inverse marking indicates a match in alignment between the person hierarchy and the grammatical relations hierarchy
  - Inverse marking indicates a mismatch
- I propose that both of these systems involve restrictions on certain combinations of person and that what differs is the repair strategies used
  - For the PCC, multiple repairs are attested (tonic pronoun, PP structure, etc.)
  - I argue that inverse marking itself is a repair strategy that involves the addition of a probe (Béjar and Rezac 2009)
• I will adopt Deal’s (2021) account of the PCC and offer an extension to inverse marking

• Deal’s account is couched within an interaction and satisfaction model of Agree (Deal 2015a)

• Under this model, probes can be specified with two types of conditions
  • Interaction conditions specify the features that probes can copy
  • Satisfaction conditions specify the features that will cause probes to halt

• Following Deal (2021), I will represent these conditions on a probe as $[\text{INT}:\phi, \text{SAT}:\phi]$  

• Separate interaction and satisfaction conditions allow a probe to interact with goals even if they will not satisfy it
The strong PCC

- Deal (2021) assumes that the strong PCC involves a probe with the features \([\text{INT}:\phi, \text{SAT}:\text{PART}]\)
- If the probe encounters a SAP DO it will be satisfied and unable to agree with the IO
- The lack of agreement with the IO will result in an inability to generate a structure with two clitics or two agreement markers
“Strong” inverse marking

- I assume the same probe specifications for inverse systems with the strong pattern: \([\text{INT} \phi, \text{SAT}: \text{PART}]\)
- If the probe encounters a SAP object, it will be satisfied
- When Voice reprojects, a probe will be added if the original probe is unable to agree with the subject
- Following Béjar and Rezac (2009), the inverse marker is a morphological indication of this added probe
Weak hierarchy patterns

- To capture weak patterns, I assume, following Deal (2021), an insatiable probe: $[\text{INT:}\phi,\text{SAT:-}]$
- Additionally, the feature $[\text{PART}]$ interacts dynamically
  - If the probe encounters a goal with the feature $[\text{PART}]^\uparrow$, it copies the feature into its interaction condition
  - On future cycles of Agree, the probe will be limited to interaction only with the feature $[\text{PART}]$ and features that geometrically entail it
- If the first goal that the probe encounters is a SAP, the second goal must be a SAP for the probe to interact with it
  - In PCC languages, if the IO is third person, a form with two agreeing objects will not be generated
  - In inverse languages, a probe will need to be added to agree with a third person subject
Accounting for four varieties of hierarchy effects

- Deal’s (2021) interaction and satisfaction account of the PCC is able to capture all four varieties
- The same probe specifications and dynamically interacting features can be used to model the parallel varieties of inverse marking

<table>
<thead>
<tr>
<th>Variety</th>
<th>Probe specifications</th>
<th>Dynamic interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>([\text{INT}:\phi,\text{SAT}:\text{PART}])</td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>([\text{INT}:\phi,\text{SAT}:-])</td>
<td>([\text{PART}]^\uparrow)</td>
</tr>
<tr>
<td>Strictly Descending</td>
<td>([\text{INT}:\phi,\text{SAT}:\text{SPKR}])</td>
<td>([\text{PART}]^\uparrow)</td>
</tr>
<tr>
<td>Me-first</td>
<td>([\text{INT}:\phi,\text{SAT}:\text{SPKR}])</td>
<td></td>
</tr>
</tbody>
</table>

- Competitor accounts (Béjar and Rezac 2009; Coon and Keine 2020, a.o.) struggle to capture all four varieties of hierarchy effects in a way that can be straightforwardly applied to inverse marking systems
Typological predictions

• Under the account pursued here, PCC systems and inverse marking systems differ in two ways
  • The height of the probe
  • The availability of an added probe as a repair
• These two factors are logically separable, predicting two additional types of systems
  • A language with a higher probe but no added probe repair
  • A language with a lower probe and an added probe repair
• Both kinds of systems predicted by this account are attested
Tupinambá monotransitive person restrictions

- In Tupinambá (Tupí-Guaraní; Brazil) the verb agrees with both subject and object when the subject outranks the object on the hierarchy 1>2>3.
- When the object outranks the subject, only object agreement appears.

Tupinambá monotransitives (Jensen 1990:121-122)

(20) a-i-kutúk
    1SG-3-pierce
    ‘I pierced him/her/it/them’

(21) syé r-epyáº
    1SG LK-see
    ‘(he/she/it/they/you) saw me’

- This pattern can be captured by assuming a probe on Voice and no added probe repair.
In Shapsug Adyghe, there is a reverse strictly descending PCC (Driemel et al. 2020)

When the IO outranks the DO, the cislocative $q^w$- appears

Driemel et al. argue that the cislocative functions as an inverse marker in these contexts

<table>
<thead>
<tr>
<th>Shapsug Adyghe ditransitives (Driemel et al. 2020:186)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(22) Sine-m se wo sə-wə-rə-tə.</td>
</tr>
<tr>
<td>Sine-OBL 1SG 2SG 1SG-2SG-3SG-give</td>
</tr>
<tr>
<td>‘Sine gives me to you.’</td>
</tr>
</tbody>
</table>

This pattern can be captured by assuming a probe on $ν$ with an added probe repair
Four types of hierarchy effects

- The decoupling of probe height and repair strategy predicts four different types of hierarchy effects
- All four predicted types of systems are attested

<table>
<thead>
<tr>
<th>Probe</th>
<th>Added probe repair?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\nu$</td>
<td>Adyghe</td>
</tr>
<tr>
<td>Voice</td>
<td>Classical Arabic</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Tupinambá</td>
</tr>
</tbody>
</table>
• I have demonstrated that all four widely recognized varieties of the PCC have parallels in systems of inverse marking

• I have argued that an interaction and satisfaction account of the PCC, following Deal (2021), is able to be extended straightforwardly to model inverse systems

• Under the analysis offered here, PCC systems and inverse systems differ only in:
  • The height of the probe
  • The availability of an added probe as a repair strategy

• Decoupling these two parameters predicts the attested four-way typology of hierarchy effects


