A set-based representation of person features: Consequences for AGREE

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Agreement shows *hierarchy effects* as described by the Person-Animacy Hierarchy (PAH) in (1a). With *alignment effects* such as direct/inverse or the PCC, a structurally closer goal like DP_1 in (1b) being outranked by a structurally further goal such as DP_2 in (1b) results in markedness or ungrammaticality. This creates restrictions on certain combinations of arguments—e.g. the *Weak PCC* of Catalan, which bans $3 > 1/2$ alignments of indirect and direct object clitics.

(1) a. 1/2 (LOCAL) > 3 (ANIMATE) > 0 (INANIMATE)   *Person-Animacy Hierarchy*
     b. [Probe [. . . DP_1 [. . . DP_2]]]   *Probe-goal alignment*

To date, PAH effects have been captured through second-order representations. These directly encode entailment relationships between person categories, as in the scale above, or features, as in the *feature geometric* approach (Harley and Ritter, 2002; Béjar and Rezac, 2003). In this paper, I argue for a revised formulation of AGREE that operates over a syntactic version of the set-based representation of person features and categories put forward by Harbour (2016). The representation captures PAH effects without geometries or hierarchies by appealing directly to containment relationships between sets. Freedom from directly encoding entailments between features opens up new probe possibilities, which are shown to capture the exact range of observed PAH alignment effects, as exemplified by the PCC.

The set-based representation The key representational move is to treat person features as the sets in (2). Each feature is a different subset of the "person ontology", which maximally includes the author (I), the addressee (U), and some number of others (O, O', etc.). The π head encompasses the entire ontology, [PART] is limited to the subset containing I and U, and [AUTH] is limited to I. Following Harbour (2016), these basic features (along with number) can combine with the head π to produce sets that define the person categories in (2). I propose that syntactically realized versions of these sets are the formal objects manipulated by AGREE.

(2) *Features (left) and person categories (right) as sets.*

π	$\{I,U,O,O'\}$
[PART]	$\{I,U\}$
[AUTH]	$\{U\}$

1SG	$\{I\}$	EXCL	$\{I,O,O'\}$
		INCL	$\{I,U,O,O'\}$
2SG	$\{U\}$	2PL	$\{U,O,O'\}$
3SG	$\{O\}$ or $\{O'\}$	3PL	$\{O,O'\}$

Reformulating AGREE The relevant attribute of the proposed features is that they stand in the containment relationships in (3), which mirror the entailments encoded by the geometry.

(3) $\pi \supset [\text{PART}] \supset [\text{AUTH}]$
     $\{I,U,O,O'\} \supset \{I,U\} \supset \{I\}$

With this in mind, I propose the following reformulation of the Match condition on AGREE:

(4) *Match*: A probe determines Match with a goal via set intersection between the set F of a feature [uF] and the set G of the goal. Match holds if $G \cap F \neq \varnothing$.

Rather than comparing whether the probe and goal share a given feature, Match evaluates whether there is overlap between a potential goal and the sets represented by the probe's

features. The head $u\pi$ Matches any goal; the feature [uPART] Matches a first or second person; and [uAUTH] a first person only. This captures the relevant implicational relationships without further ado: e.g. Match holding between a set G and [uAUTH] implies that G Matches all other features as well—every feature's set contains I. In contrast, a third person only provides a match for $u\pi$, as the sets of [uPART] and [uAUTH] lack O's.

Freeing probes Under the feature geometry, person probes are constrained by representationally encoded entailments—e.g. the presence of [uAUTH] implies [uPART] and $u\pi$ (but not vice verse). In the present account no such restrictions hold—[uAUTH] and [uPART] can appear either together or each on their own. I assume that these features are, fused probes aside, hosted on the head π, thus $u\pi$ is a necessary part of a person probe. This allows for four possible probes, while the geometric account only allows for three—the difference being in whether a probe that lacks the "intermediate" feature [uPART], but includes [uAUTH], is possible.

The PCC I choose the PCC to exemplify PAH effects, as the range of variation, and how it connects to the structure of the probe, is reasonably well-established. I adopt the *feature gluttony* account of Coon and Keine (2020), where alignment effects can arise when a probe agrees with multiple goals. In the case of the PCC, issues arise not with Gluttony per se, but with spell-out when two clitics must be formed at once. Gluttony arises when *a structurally distant DP provides a better match for the probe than a closer DP*, leading both to be probed. Given that probes can be articulated to different degrees, exactly which types of arguments provide a better match is a relative notion. These relationships are summarized in (5), where *each of the four possible probes are represented*. (N.B. The *Strong/Weak* distinction, where the same probe is utilized, is captured by independent properties of datives). The major upshot is the presence of *Me-First* languages, which are captured by a probe lacking [uPART] but including [uAUTH]—only a DO with i (i.e. a first person) provides a better match for the probe than the IO, causing Gluttony (adding the "intermediate" [uPART] derives the *Ultra Strong* PCC). This probe is predicted under the proposed set-based theory, but must be stipulated as an exception to the entailment relationships between features under the geometric approach.

(5) *Summary of PCC effects and probe structures from Coon and Keine (2020)*

	IO > DO	Example	Probe
Ultra Strong	*3 > 1/2, *2 > 1	Classical Arabic	[$u\pi$], [uPART], [uAUTH]
Strong	*1/2/3 > 1/2	Basque	[$u\pi$], [uPART]
Weak	*3 > 1/2	Catalan	[$u\pi$], [uPART]
Me-First	*1/2/3 > 1	Romanian	[$u\pi$], [uAUTH]
No PCC	—	Moro	[$u\pi$]

Conclusions The account provides a way to integrate Harbour's set-based theory of person with a theory of agreement. Besides forming this link, the shift to the set-based approach has conceptual and empirical advantages. First, PAH effects are derived without second-order representations such as scales or hierarchies. This captures entailments between features and person categories without hard-coding these relationships into the representation. Instead, these relations fall out naturally from independently motivated containment relationships between sets. Second, it provides a path to create probes that lack "intermediate" features such

as [*u*PART], capturing the *Me-First* PCC. Such probes have been proposed previously (e.g. by Coon and Keine, 2020), but were notably delinquent under the geometric approach.

References

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