Contrastive hierarchies and the formal representation of person

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Harbour (2016) proposes a theory of person features that generates exactly the attested systems of grammatical person contrasts, listed in (1), improving on previous accounts (e.g. Halle 1997; Harley & Ritter 2002a,b), which either overgenerate or include ad-hoc stipulations.

(1) a. 'Monopartition': No person contrasts
b. Author bipartition: $\{i_o, iu_o\}$ / $\{u_o, o_o\}$
c. Participant bipartition: $\{i_o, iu_o, u_o\}$ / o_o
d. Tripartition: $\{i_o, iu_o\}$ / u_o / o_o
e. Quadripartition: i_o / iu_o / u_o / o_o

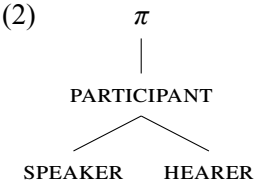
However, there is a cost: **A.** The features are formally more powerful: rather than first-order predicates (simple properties), they are operations on lattices, adding and subtracting elements (from the universal ontology comprising a unique speaker i, a unique addressee u, and arbitrarily many others o_o) to or from the lattice they apply to, rather than marking the presence or absence of a property. They are not commutative: applying features in different orders can produce different results. Thus, ⟨−participant, +author⟩ yields 1EXCL, while ⟨+author, −participant⟩ yields 3. This sensitivity to ordering allows more distinctions to be captured with fewer features.

B. Two other mechanisms are needed: The first (restriction to D_e) deletes empty sets, which arise because subtraction of elements from a set can result in the null set. The second (lexical complementarity) narrows the result of a given specification so as to eliminate overlap with the result of another specification. This second operation is non-local—it must have access to the results of other feature combinations so as to know whether and how to apply.

We argue that if feature dependencies are taken to reflect a contrastive hierarchy, not a feature geometry, and if we adopt Harbour's person ontology, we can generate all and only the attested partitions using first-order features, and without extra mechanisms to adjust the results.

Harley & Ritter (2002a) propose (2), which (without HEARER) accounts straightforwardly for the partitions in (1a), (1c), and (1d). Languages that distinguish INCL from EXCL 1st person also use HEARER: inclusives bear both SPEAKER and HEARER. This system cannot generate the author bipartition (1b), since any language that uses SPEAKER must also use PARTICIPANT, giving the tripartition (1d). And it overgenerates: a language using HEARER but not SPEAKER would have a 2/INCL vs. 1EXCL vs. 3 tripartition, while a language making full use of all three features would have a five-way partition in which general participants contrast with 1EXCL, 2EXCL, INCL, and 3. Also, as Harbour & Elsholtz (2012) argue, feature geometries stipulate combinations of features; they do not explain why some combinations are or are not attested.

(2)



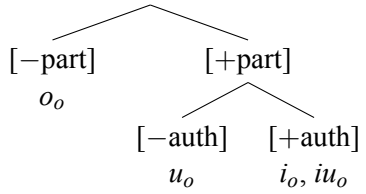
Halle (1997) uses the features [±auth(or)] and [±part(icipant)]. Quadripartition involves full cross-classification: e.g., the Walbiri exclusive is characterized as [+auth, −part]. Halle notes that in Walbiri, there is no singular 1EXCL pronoun, attributing this to the contradiction that arises if [+auth] and [−part] are attributed to a single individual. For him, in languages with a tripartition, the [+auth, −part] combination is simply not used—a situation Harbour characterizes as "parametric deactivation." But some languages with quadripartition differ from Walbiri in having 1SG forms that pattern with 1EXCL.PL, and Halle gives no reason why only one of the four logically possible combinations of two feature values can be left unused.

We propose that the key insights of Harbour's account can be achieved with first-order features, organized not into a feature geometry, but rather into a contrastive hierarchy (as proposed for phonological features by Dresher 2009 and works cited therein). In this view, formal representations are assigned by successive subdivision of the inventory (here, the inventory of combinations of persons in Harbour's iuo_o ontology) by the assignment of features. The sequence of divisions determines the relative scope of the features: a later feature may divide all, or only some, of the subinventories distinguished by earlier features. The order of divisions is not stipulated; scope varies freely from one language to another, constrained only by semantic compatibility of feature values.

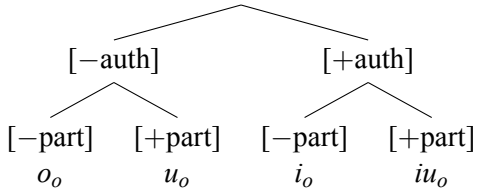
Given the first-order features [±auth] and [±part], (1a) is derived with no divisions, (1b) with a single division by [±auth], and (1c) with a single division by [±part]. Using both features gives (1d) or (1e), depending on their scope. If [±part] takes wider scope, as in (3), [±auth] is contrastive only in the

[+part] realm; this yields the tripartition (1d). If [±auth] takes wider scope, then we propose that the interpretation of [±part] is automatically narrowed to 'participant other than speaker', since this is the only possible interpretation that allows it to be contrastive in this context; i.e., to divide a subinventory where the inclusion or exclusion of the speaker has already been marked. With this narrowing, [±part] is contrastive on both branches, yielding quadripartition (1e) as in (4).

(3)



(4)



The narrowing of the interpretation of [±part], which gives essentially [±hearer], derives from its position in the contrastive hierarchy, as follows. It has a narrow interpretation iff it has narrow scope. Its meaning thus depends on the domain it divides. No analogous narrowing of [±auth] is possible to allow it to divide the [−part] subinventory in (3); the interpretation 'speaker other than a discourse participant' is nonsensical. We conclude that with a contrastive hierarchy, it is possible to account for exactly the attested person partitions with first-order features and no additional mechanisms.

The contrastive hierarchy approach retains the core benefit of feature geometries—the ability to express dependencies among feature values—but without stipulating those dependencies, and without unnecessarily enriching the structure of the representations themselves. The ordering of features in a contrastive hierarchy is more like Harbour's ordering of features than it is like a feature geometry, but the contrastive hierarchy allows the features themselves to be defined as first-order predicates.

This approach also make predictions about acquisition. The formal mechanism that constructs contrastive hierarchies—Dresher's (2009) Successive Division Algorithm (SDA)—can readily be interpreted as an acquisition procedure. If acquisition proceeds without backtracking, then we expect the order of acquisition to correspond to hierarchical scope: features higher in the tree should be acquired first. In tripartition language, children learning the hierarchy in (3) should begin by distinguishing participants from third persons, and may initially conflate 1 and 2; in a quadripartition system as in (4), children should initially separate first persons from the others, and only then distinguish 2 from 3 or 1EXCL from 1INCL. Conflation of 1 and 2 is attested in children acquiring tripartition languages (e.g., Oshima-Takane 1992; Moyer et al. 2015); research on quadripartition languages is sparser and so far inconclusive. Much work in this area has been framed in terms of the acquisition of items—either particular forms or paradigmatic categories—but the contrastive hierarchy approach implies that the proper focus of such studies is the acquisition of distinctions, in the spirit of Jakobson (1941).

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