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Comparative concepts and practicing typology: on Haspelmath's proposal for "flagging" and "(person) indexing"

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1 Introduction: Comparative concepts and their utility

In this volume, Martin Haspelmath argues for the use of flagging and (person) indexing as comparative concepts. Comparative concepts are theoretical constructs in typology that serve as the basis for crosslinguistic comparison of grammatical structures in the development of language universals and their explanation (Haspelmath, 2010). As such, they are central to practicing typology, and have been discussed since at least the beginning of modern typology (Greenberg, 1966; see Croft, 2003:13-19, 2014, 2016 for further discussion). Haspelmath has been a leading proponent for explicitly defining a set of comparative concepts for use in typology.

Haspelmath's comparative concepts of flagging and indexing are intended to provide an explicit definition that captures the distinction between two types of contrasting grammatical constructions, the paradigm cases of which are illustrated by the Latin example in (1) (Haspelmath's example 18.a.2):

(1) Marc-**us** Tit-**um** vidi-*t*
Marcus-**NOM** Titus-**ACC** saw-*3SG*
'Marcus saw Titus.'

The nominative affix *-us* and accusative affix *-um*, indicated by boldface in (1), are examples of flagging. The third person singular affix *-t*, indicated by italics in (1), is an example of (person) indexing.

The contrast between the nominative/accusative affixes and the third person singular affix in (1) has been captured by different theoretical constructs in different theories. The relevant theoretical constructs that are mentioned by Haspelmath, and that will be discussed in this comment, are given in Table 1:

Table 1. Theoretical constructs for distinguishing the paradigm constructional contrast in example (1)

Theoretical approach	*paradigm construction: nominative/accusative affixes*	*paradigm construction: person/number etc. affixes*
Traditional Western grammar (e.g., Matthews 1981:246-255)	agreement	government (case)
Nichols (1986, 1992)	head-marking	dependent-marking
Croft (1988, 1990, 2003)	indexical (person)	relational (case marking)
Haspelmath (2013, this volume)	(person) indexing	flagging

Of the theories given in Table 1, Nichols, mine and Haspelmath's are explicitly typological. The traditional Western grammar concepts are not explicitly typological, but they were assumed to apply across at least Western European languages, if not more languages.

As theoretical constructs, the pairs of concepts in each row of Table 1 are in fact very different and defined in very different ways. The differences are motivated by empirical and theoretical reasons. The empirical reason is that the paradigm cases by no means exhaust the range of constructions that are considered to belong to the same "family" as the paradigm constructions in (1): crudely, constructions that relate two concepts that are linguistically expressed in an utterance. The paradigm constructions in (1) pertain to the special case where the two concepts are a predicated event and a referent that is functioning as an argument of the predicated event.

These other constructions, at least those considered by Haspelmath, will be introduced below. The different scholars cited in Table 1 chose to assimilate the range of constructions into the two paradigm cases in different ways, and also choose to exclude some of these constructions from the domain of analysis entirely. These different choices are influenced in part by the typological facts, and in part by the theoretical orientations of the different scholars—this is the theoretical motivation for the different theoretical constructs in each row of Table 1.

Haspelmath justifies the introduction of his new pair of theoretical constructs, in part by providing an explicit definition, in part by showing how his pair of theoretical constructs divides the range of related constructions, and in part by showing why this new pair of constructs is more useful in typology than prior proposals. He does this primarily by offering a critique of head-marking vs. dependent-marking, making brief reference to the traditional concepts of agreement and government, and to the comparative concepts that I proposed.

In this comment, I will briefly summarize Haspelmath's arguments, and then offer arguments as to why the constructs that I originally proposed in 1988 and 1990 are more useful as comparative concepts. I will focus on Haspelmath's primary criteria for the utility of comparative concepts: that the definitions are explicit and cross-linguistically valid, and that they help us to reveal interesting typological generalizations (universals). The most important conclusion I will argue for, however, is not a preference for one set of comparative concepts over another. It is that useful comparative concepts are not developed independently of empirical investigation, nor are they theoretically neutral. Judging the

utility of comparative concepts is simultaneously judging the value of the empirical cross-linguistic generalizations that they reveal and the theoretical explanations offered for those generalizations.

2 Haspelmath's concepts of flagging and (person) indexing: explicitness and cross-linguistic validity

Haspelmath defines flag and person index as follows (his (6) and (7), emphases added):

(2) **flag**
A **flag** is a *bound form* that occurs on a *nominal* and that indicates the *semantic or syntactic role* of the nominal with respect to a *verb* (in a *clause*) or with respect to a *possessed noun* (in a *complex nominal*).

(3) **person index**
A **person index** is a *bound form* denoting a *speech role* or a *highly accessible third person referent* that *occurs on* a *verb* (or in *second position*) to indicate a verb's *argument*, or on a *noun* to indicate its *possessor*.

In the definitions, the terms being defined are in boldface. But such terms can only be defined in terms of other comparative concepts. The other comparative concepts that are used in the definitions are in italics.

Haspelmath's comparative concepts incorporate both formal and functional properties. In earlier typological research, including my own research, it has generally been assumed that theoretical concepts for crosslinguistic comparison must ultimately be based on functional definitions, primarily semantic concepts or discourse functional (also called information structure or information packaging) concepts. That is, formal or structural categories are hopelessly language-specific and cannot serve as comparative concepts. However, Haspelmath (2010) argues that one can construct comparative concepts that combine both functional and formal properties, as long as the formal properties are defined in a cross-linguistically valid way. I agree with Haspelmath (Croft, 2014, 2016; see also Croft, 2009:161-62).

The first criterion for evaluating Haspelmath's definitions is the explicitness and cross-linguistic validity of the comparative concepts used to define flags and person indexes. (Haspelmath introduces numerous other comparative concepts in the paper in the course of presenting arguments supporting the concepts of flag and index; space prevents me from discussing all of them.) The comparative concepts of *occurs on* and *second position* are dependent on word or morpheme order. The concept of ordering is mostly uncontroversial, but the question is, order of what? (Croft, 2009:162). That is, order is dependent on the elements ordered, such as *verb* and *nominal* in the definitions above.

Haspelmath defines *bound, nominal, occurs on (a nominal)* and *syntactic role* at the end of section 3 of his paper. However, *nominal* and *syntactic role* are both defined in terms of *argument*, which is not defined there. At the end of section 6, Haspelmath writes of *verb, noun, nominal, argument* and *possessor* that they 'are clearly defined by their semantic cores'. The definitions of these comparative concepts are not purely defined by

semantics; hence I find Haspelmath's brief comment to be insufficient for an explicit definition of these comparative concepts. However, discussion of these definitions is beyond the scope of this comment.[1] I agree with Haspelmath that a prototype ("core") definition of at least *verb*, *noun* and *nominal* are the most useful for cross-linguistic comparison.

This leaves the concept of *bound*, which Haspelmath discusses at some length. His concern is primarily with the relationship between what are generally called adpositions and case affixes. He rightly argues that it is very difficult to distinguish these two categories, because of the absence of a well-defined comparative concept of 'word'. This lack is due to the use of language-specific phonological, morphological and/or syntactic criteria to define words in particular languages, the wide variation across language in terms of what linguistic unit a particular criterion defines, and the wide variation across criteria within a language in terms of what linguistic unit they define.

Haspelmath's solution is to adopt a single criterion, which he calls boundness: the impossibility of the linguistic unit to occur in isolation. While this choice provides an explicit definition, I find it problematic for a number of reasons. First, it only cuts the Gordian knot of the cross-linguistic and intra-linguistic variation of wordhood criteria.[2] A more useful typological concept would address the relationships between different proposed wordhood criteria. Haspelmath chooses one criterion which may not be the most important relevant property of morphemes or morpheme combinations.

Second, while the definition is clear, determining whether a morpheme can occur in isolation or not is very difficult in practice. This is not a fact that is generally given in reference grammars. One cannot safely rely on the orthography in reference grammars. The orthography in reference grammars is based on language-specific definitions of wordhood, which are problematic as Haspelmath himself notes (Haspelmath, 2011).

This problem is partly the consequence of the most serious problem with the boundness criterion. When can a form be used in isolation? Many discourse studies have demonstrated that the most common intonationally autonomous units are the clause and the noun phrase, which in some languages may be a simple verb or a noun respectively (Croft, 2007 and references cited therein). This fact does not help for applying boundness to the sorts of morphemes of interest here.

Morphemes other than nouns and verbs may occur as isolated units in the context of elliptical constructions, of which perhaps the most common are identificational (focus) constructions that allow all of the presupposed part of the construction to be elided completely, as in example (4B), rather than retained or reduced to a proform, such as *it* in example (4A):

(4) A: Is the ball inside the box or outside (it)?
B: Inside.

Hence, apart from nouns and verbs, boundness is basically defined by the strategy employed by identificational or other elliptical constructions in the language. I am not sure that bound vs. free morpheme status should be defined in terms of the strategy used for identificational or other elliptical constructions in a language. (In addition, the typology of elliptical constructions has not been surveyed to my knowledge, nor is it often described in reference grammars—part of why this criterion is hard to apply in practice.)

Selecting boundness or some other single criterion proposed for wordhood misses the typological reality for adpositions vs. case affixes, which is that there is a gradual grammaticalization process by which adpositions evolve into case affixes. The starting point—actually relational nouns or serial verbs—is agreed to be a free form, and the endpoint (if the process proceeds all the way) is agreed to be a bound form. I do not see the utility of selecting an ultimately arbitrary dividing point somewhere in between. My point of view here reflects both an empirical typological generalization—the grammaticalization process described above—and a theoretical orientation—that typological generalizations often have diachronic explanations. I will return to this point below.

3 Haspelmath's critique of head marking vs. dependent marking

Haspelmath compares flags vs. indexes to head marking and dependent marking, arguing that the latter are less adequate as comparative concepts. He gives several reasons why. One is that head marking vs. dependent marking are not functionally defined: they are defined solely by the position of the morpheme, not by the function that the morpheme plays. Another, less prominent and perhaps considered less important by Haspelmath, is that the head marking/dependent marking typological classification is holistic (a characteristic of the language as a whole)—what Greenberg (1974) describes as an individualizing approach to language typology. The flag/index classification is what Greenberg calls generalizing: a characteristic of particular constructions in the language that can be compared across languages to form language universals. I agree with Haspelmath's judgment here.

These are theoretical considerations, about what language universals are—generalizing, not individualizing or holistic—and what their likely explanations are—functional, not structural or formal. This observation illustrates the point that I alluded to in the introduction: the choice of comparative concepts is not purely pragmatic, but based in part on one's theoretical approach to the topic.

Haspelmath's third argument is that the head-dependent contrast cannot be defined satisfactorily, concluding that 'nobody knows how to identify heads and dependents in such a way that other linguists would agree, even if only agreement in broad terms is aimed for'. Consensus, however, is a different criterion than cross-linguistic validity. I would not expect a consensus on definitions for central syntactic concepts, especially across formalist and functionalist approaches. I developed a cross-linguistically valid definition of head (and dependent) as comparative concepts that is typologically useful (Croft 2001, chapter 7), even if it may not be agreed upon by all linguists, particularly formalist linguists.[3]

4 Constructions included and excluded in the flag vs. person index distinction

In section 1, I noted that there is a range of constructions beyond the paradigm examples illustrated in example (1). Haspelmath discusses a number of these, using his definition to include or exclude them as flags or indexes.

Haspelmath excludes from the category of flags morphemes that encode semantic or syntactic roles that are not bound. Presumably, that means he would exclude *inside* in (4), while including *in*, which (arguably) cannot occur in isolation.

Haspelmath includes in the category of (person) indexes morphemes that cannot "agree" with another syntactic element because that other element is absent in the clause. This is null anaphora, where a highly accessible referent is linguistically unexpressed—a very widespread though not universal phenomenon. He notes (following Siewierska 1999) that there are a number of intermediate constructions in which the "agreed with" nominal, which he calls a conominal, is sometimes present, sometimes absent.

Haspelmath excludes from the category of (person) indexes what he calls a construct marker, which he defines as a morpheme (either a segmental morpheme or base modification) that occurs on a possessed noun that is modified by an adpossessor (his term). He also excludes from the category of flags what he calls an anti-construct marker, which he defines as a morpheme that occurs on an adjectival (property concept) modifier.

Haspelmath excludes from the category of flags what he calls concordants, which traditionally are described as agreement markers on modifiers such as attributive adjectives. Haspelmath also excludes agreement markers on predicates that encode the number and/or gender of the argument but do not encode person, such as the Russian Past Tense verb forms (Haspelmath, this volume, fn. 9).

One consequence of Haspelmath's exclusion of concordants/modifier agreement is that indexes always encode person. This is actually part of his definition of index, which denotes a 'speech act role or a highly accessible third person referent', i.e. 1st, 2nd or 3rd person forms. Thus, Haspelmath treats the modifier 'person' in 'person index' as optional, and usually drops it.

Finally, Haspelmath includes person markers for possessors as indexes, via an explicit, disjunctive definition.

Haspelmath's choices here will be discussed in the following section in comparison to the comparative concepts that I have developed in this domain.

5 The comparative concepts in Croft (1988, 1990/2003)

Haspelmath's article presents definitions of two comparative concepts, flag and index, and applies them to a number of constructions, in particular the paradigm constructions illustrated in (1) and a number of other constructions described in §4. He also criticizes the head marking vs. dependent marking comparative concepts, partly for lack of clarity but also for reflecting a different theoretical approach from his functional, generalizing approach. However, he ends his paper by essentially admitting that he has not really demonstrated the practical value of his comparative concepts in terms of their utility in capturing typological universals (he does argue that his concept of index underlies universals proposed in his 2013 paper).

I share Haspelmath's theoretical approach, but developed a different set of comparative concepts around thirty years ago (Croft, 1988; 1990), which I have revised somewhat since then (Croft, 2003, in prep.). In this concluding section, I briefly describe the theoretical basis for the comparative concepts I proposed, and argue that they are more useful for at least some typological universals than Haspelmath's proposed definitions.

For the paradigm constructional contrast in (1), I use the terms 'indexical' and 'relational'. For the paradigm cases, they correspond fairly closely to Haspelmath's index and flag, respectively, in that they are functionally defined: an index refers to the argument, and a relational form denotes the semantic relation between the argument and the predicate (Haspelmath's semantic or syntactic role).

In Croft (1988), I described the contrast in terms of 'deictic' vs. 'relational' strategies, and for the universals discussed in that paper, suggested that the 'deictic' strategy is restricted to person deixis. In this respect, my original formulation is quite close to Haspelmath's, in its focus on predicate-argument (and possessed-possessor) relations, and its restriction of (indexing) deixis to person deixis.

In the first edition of *Typology and Universals* (Croft, 1990), the set of strategies was expanded to cover all ways in which the relation between two syntactic elements could be expressed, including strategies without a specific morpheme such as an index or a case marker/flag. In other words, the set of comparative concepts was made as inclusive as possible.

Hence, strategies that Haspelmath excludes from his flag/index contrast (see §4) were added as further comparative concepts in Croft (1990). In particular, what Haspelmath calls construct (attached to a head) and anti-construct (attached to a dependent) markers are analyzed as *linkers*. Linkers are overt forms that encode a relation but do not form a paradigmatic contrast with other forms. Hence one cannot define a linker as either indexical (since it does not contrast with other forms in person, number and/or gender) or relational (since it does not contrast with other forms to distinguish semantic relations). Base modification, grouped with construct markers by Haspelmath, is categorized as a *special form* since there is no additional morpheme for expressing the relation between the concepts. Case affixes and adpositions are distinguished, unlike Haspelmath. What Haspelmath calls concordants are distinguished from person indexation, and divided into two categories: (nonperson) agreement and classifiers.

In the second edition of *Typology and Universals* (Croft, 2003), the expanded set of discrete comparative concepts from the first edition is retained, but embedded in an empirically and theoretically motivated framework for the comparative concepts. The empirical motivation consists of the grammaticalization paths that link together sets of the morpheme categories; these represent typological universals of diachronic change. Figure 1 (from Croft, in prep., adapted from Croft, 2003:40, Fig. 2.1) illustrates the comparative concepts and their relationships to each other.

In presenting the empirical diachronic motivation for the comparative concepts in Figure 1, I reintroduced the indexical-relational contrast from my 1988 chapter. I included nonperson indexation (Haspelmath's concordants) as a subtype of the indexical strategy, and split classifiers as to whether they functioned indexically—referring to the modified referent—or relationally—denoting the semantic relation between the two concepts.

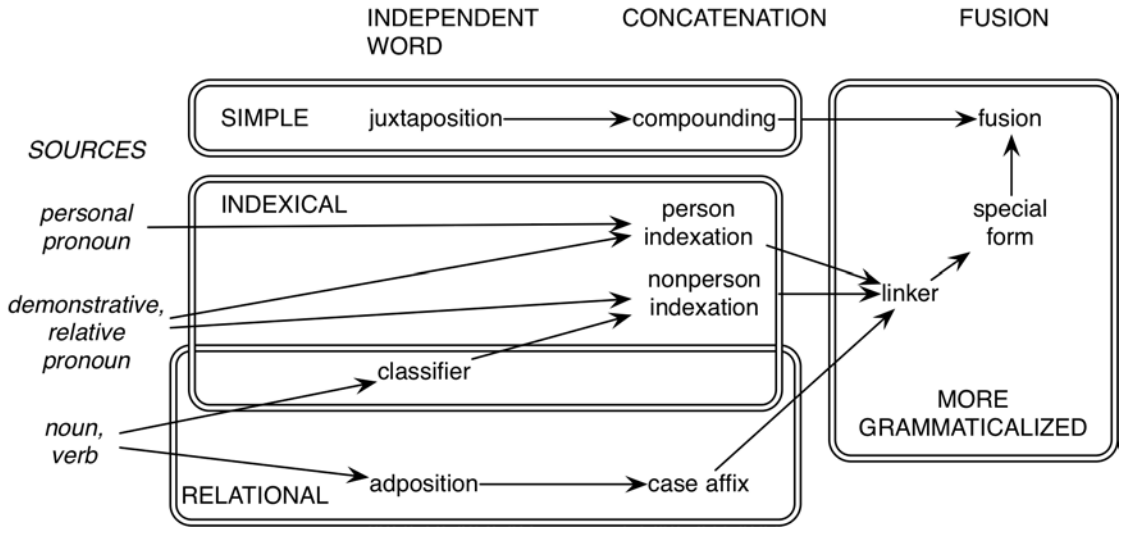

Figure 1. Strategies for relating concepts and their diachronic relationships.

6 Comparing the comparative concepts

I conclude this comment by arguing that the comparative concepts in Figure 1 have greater utility in capturing interesting typological universals than the flag/(person) index contrast.

There are three primary differences between the flag/(person) index contrast and the comparative concepts in Figure 1. First, the comparative concepts in Figure 1 have broader scope than the flag/(person) index contrast. Second, the comparative concepts in Figure 1 are not constrained by a restriction to only bound markers (as defined by Haspelmath). Third, the comparative concepts in Figure 1 include a higher-level grouping of person markers and nonperson markers as indexation markers, which is opposed to relational (and simple) concepts. Haspelmath's comparative concept of (person) index excludes nonperson markers (his concordants), and instead groups flags and person indexes as role identifiers, against nonperson markers as concordants.

The comparative concepts in Figure 1 represent a more comprehensive typological classification of strategies for the linguistic expression of relations between concepts than the flag/(person) index contrast. Even if one includes the category of concordants along with flags and (person) indexes, the category of linkers is not included in Haspelmath's typological classification. Hence the comparative concepts in Figure 1 are of greater use in typological classification in this domain.

The comparative concepts in Figure 1 capture the diachronic universals of grammaticalization paths alluded to in §5. The distinct paths are really the comparative concepts; terms such as 'adposition' vs. 'case affix' or 'juxtaposition' vs. 'compounding' are somewhat arbitrary characterizations of points on the grammaticalization paths. Excluding markers that are on these paths but not yet bound renders flag/index problematic for describing these grammaticalization universals.

The comparative concepts in Figure 1 also capture the universals regarding the interaction of the animacy hierarchy, the definiteness hierarchy and the grammatical roles (relations) hierarchy described in Croft (1988) and references cited therein; see also Croft

(2003, chapter 5). Haspelmath's distinction between flagging and (person) indexing largely captures these universals. However, Haspelmath's restriction of these comparative concepts to bound markers only makes the flag/(person) index contrast less able to capture these generalizations, which hold regardless of the boundness of the marker.

The greatest clash between the comparative concepts in Figure 1 and the flag/(person) index/concordant scheme is the way that the analogous concepts are grouped. Here I discuss typological universals which group together both person and nonperson indexation, as I call them, and distinguish both from relational markers (specifically, case markers, or flags in Haspelmath's terms[4]). The classification of comparative concepts in Figure 1 captures this grouping, while the grouping of flags with (person) indexes and against concordants does not.

The functional description of person and nonperson markers is basically the same: they denote the referent, that is, the concept that the predicating or modifying concept is related to. Person markers denote the referent via the category of person and often also the categories of number and gender (reflecting their diachronic origin as personal pronouns encoding these categories). Nonperson markers denote the referent via the categories of number and also gender (the latter generally implicating the former; see Greenberg, 1966, Universal 36). In contrast, relational markers (flags) denote the semantic relation that holds between the two concepts related by the marker.

One universal that appears to follow from this functional fact is that in the case of both person and nonperson markers, the form expressing the referent may be, and often is, absent, as in the Spanish examples in (5):

(6) Ø Prefiere la roja Ø
prefer:3SG.PRS the.FSG red.FSG
'S/He prefers the red one.'

The functional explanation appears to be that when the identity of the referent is highly accessible in the context, then it need not be expressed. Many linguists, including Haspelmath and myself, have argued that "all indexes refer" (see for example Croft, 2001:226-32; Croft, 2013; Haspelmath, this volume, §10). However, this statement applies equally to person and nonperson indexes (as I call both). Conversely, it does not apply to relational markers/flags (not to mention linkers), which always require overt expression of both concepts being related.[5]

This explanation also accounts for a diachronic grammatical universal about the source of nonperson markers, demonstrative pronouns. Demonstrative pronouns may grammaticalize into nonperson markers, or third person pronouns and hence person markers, or both at once. This fact indicates a diachronic relationship between person markers and nonperson markers that is absent between person markers and case markers: the latter to my knowledge do not grammaticalize into the former.

Another argument supporting the grouping of person and nonperson indexes as a unitary higher-order comparative concept is the Agreement Hierarchy. The Agreement Hierarchy is manifested in cases where there are (at least) two different options for the target index with respect to the controller categories. A simple example is the set of (typically British) English group nouns such as *committee* (Corbett, 2006:206):

(7) a. The committee has [SG] decided.
b. The committee have [PL] decided.

The difference in the choice between singular and plural indexation for *committee* is usually characterized as 'syntactic agreement' and 'semantic agreement' respectively: *committee* is grammatically singular but semantically plural. It is actually better to think of the choices as ranked by "degrees of semanticity"; what matters is that one choice is "more semantic" than another.

In (British) English, either choice is available for the indexation of predicates, as in (7a-b). For the indexation of modifiers, only the "less semantic" singular is acceptable: *this/*these committee*. However, relative pronouns may go either way, as in (8a) (the "more semantic" choice is the human relative pronoun *who*; Corbett, 2006:207), as may anaphoric personal pronouns, as in (8b):

(8) a. The committee, which **has** decided/**who have** decided…
b. The committee…**It/They**…

These four contexts form a hierarchy, the Agreement Hierarchy, such that targets lower on the hierarchy are more likely to index the controller in the more "semantic" features than targets higher on the hierarchy (Corbett, 1979:204):

The Agreement Hierarchy:

attributive (modifier) — predicate — relative pronoun — personal pronoun

The English *committee* example conforms to the Agreement Hierarchy: the demonstrative modifier allows only the less "semantic" feature (singular), but the predicate, relative pronoun and personal pronoun allows indexation in either the less or more "semantic" feature (singular or plural).

Corbett extensively documents examples conforming to the Agreement Hierarchy from many languages (Corbett, 1979, 1983, 1991, 2000, 2006, inter alia). However, the Agreement Hierarchy can only be understood using a comparative concept of indexation that embraces nonperson markers and person markers, and also personal pronouns. The comparative concept of indexation grouping both person indexation and nonperson indexation does just that.[6] Case markers/flags, in contrast, do not participate in the Agreement Hierarchy.

Having presented typological universals that can only be captured by grouping together person markers and nonperson markers in a single category, which I call indexation (Croft, 2003), I turn to the argument presented by Haspelmath to support grouping person indexes and flags/case markers together as against nonperson indexes/concordants. Haspelmath argues that person indexes and case markers are role identifiers, that is, their forms can distinguish semantic roles or relations between the referent and the concept to which the referent is related. For example, in some languages, predicates can take multiple person markers which are frequently distinguished as subject and object person markers. In contrast, nonperson markers on modifiers only show that the modifier and its head are related.

However, the function of person indexes as role identifiers is questionable. The alternative analysis is that the person marker indexes the most salient participant(s), with role being at most a secondary consideration (Croft, 1988, in prep.).

In some languages with person indexes, the person marker on a predicate indicates the argument with respect to its role in the (extended) animacy hierarchy, in particular the ranking of person. For example, Tangut indexes just one core argument, whichever one is 1st or 2nd person (if both are 1st and 2nd person, then the verb indexes the patient; DeLancey, 1981:631). Tangut is only one example of the sensitivity of indexation to animacy. Many languages with indexation of one or more core arguments are sensitive to the relationship between animacy and core argument role. This is the phenomenon usually described as "inverse marking". In Croft (2001, chapter 8), I argued (following Siewierska 1985 and others) that there is no typological distinction between "passive" and "inverse" constructions: all such nonbasic voice constructions exhibit at least some sensitivity to animacy or topicality. In fact, the "passive" voice alone shows that indexation, or subject/object encoding, is at best indirectly related to role identification: a passive subject index identifies a different role than the same index does on an active verb form. Pace Haspelmath, core argument roles, which he calls syntactic roles, are not primarily defined on semantic roles but primarily signal the salience to the speaker of the referents in the event expressed by the predicate.

It is true that my functional definition of the comparative concepts of the core argument roles (Haspelmath's "syntactic roles") as salient participants applies equally to case markers/flags for core argument roles. But the point is that this is a corollary of how arguments are encoded in clauses, not a consequence of person indexes+flags vs. nonperson markers as role identifiers. And in fact, when nonperson indexes are used for indexing arguments of predicates, they conform to the same salience-based typological universals as person indexes. For example, if a verb indexes one argument with a nonperson marker, it is the role that includes S (intransitive subject), i.e. either nominative (S+A) or absolutive (S+P); if it indexes a second argument with a nonperson marker, it is the other core argument (P or A). Nonperson indexes can use distinct forms for indexing the two core arguments, as in Zuni (Newman, 1965, p. 45, 53); and they do not index noncore arguments. Thus, one would have to include nonperson markers as well as person markers and case markers/flags in the formulation of these universals of the expression of predicate-argument relations.

I have argued in this section that the comparative concepts in Figure 1 are more useful in crosslinguistic comparison and the formulation of typological universals than the (person) index/flag distinction. The important point, however, is not this argument. It is not an accident that the comparative concepts in Figure 1 are useful in capturing language universals. It is because the comparative concepts in Figure 1 were developed for the most part with the typological universals referred to in this section in mind. This is the primary point I wish to emphasize in this comment: development of useful comparative concepts occurs hand in hand with, and often after, the typological universals that they are intended to "reveal". And their definition is based on theoretical assumptions that the creator of the comparative concept thinks are useful for explaining those universals.

Notes

[1] See Croft 1991, 2001, in prep. for more explicit definitions of these comparative concepts.

[2] Haspelmath does not claim that boundness defines wordhood, incidentally; see Haspelmath 2018:319, fn. 12.

[3] Haspelmath cites the critique of syntactic definitions of head that I provided, and summarizes the semantic definition of head as a comparative concept that I proposed, but does not accept its consequences, namely that adpositions and auxiliaries are not heads. He does not offer a reason why this is problematic in a way that the consequences of his definitions of flag and (person) index are not.

[4] Haspelmath (this volume, fn. 4) criticizes the use of *case marker/case marking* instead of flag as 'non-transparent' and 'confusing'. But this use of terms is transparent: *marker* is commonly used for terms regardless of boundness or wordhood, and *case* expresses the grammatical semantic category. In addition to myself, *case* is used in this general sense by Siewierska (2004:47), as noted by Haspelmath; Dryer 2013; and by the Universal Dependencies syntactic annotation project for both the syntactic dependency to a free form (https://universaldependencies.org/u/dep/case.html) and the morphological feature (https://universaldependencies.org/u/feat/Case.html).

[5] In some languages, adpositions may index the referent, and due to the indexation of the referent, the referent may be left unexpressed. But this is due to the presence of indexation, not the adposition.

[6] In fact, the concept of indexation would have to be extended to personal pronouns in order to describe the Agreement Hierarchy. I see no serious objection to doing that, since personal pronouns are the starting point of the grammaticalization continuum that leads to (person) indexes; Haspelmath does the same (Haspelmath, this volume, section 4). If one needs to make a distinction between personal pronouns and person "agreement", this can be done, perhaps by defining the latter as allowing the possibility of doubling (double expression of a referent in a clause) by a conominal. Even here, though, there is a continuum as Haspelmath notes (ibid.).

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