22. Inflectional Synthesis of the Verb

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1.   Defining synthesis

Grammatical categories like tense, voice, or agreement can be expressed either by individual words or by affixes attached to some other word (or the stem of a word). If a word combines with affixes, the resulting construction is said to be **synthetic**; if not, it is said to be **analytic**. For example, in the past tense, the English verb combines with an affix expressing tense (cf. *she painted*, with suffix *-ed*). Forms like *painted* are called synthetic. In the future tense, by contrast, the verb does not combine with an affix; the future is instead expressed by a separate word (*will*, as in *she will paint*). Expressions like *will paint* are called analytic.

In general, a string of elements makes up one synthetic word when these elements stand in a morphological, and not in a syntactic, relation to each other. For example, *paint* and *-ed* stand in a morphological relation to each other, and they therefore make up one word; *will* and *paint*, by contrast, stand in a syntactic relation to each other, and they are therefore two words. Morphological relations are generally more constrained; they imply fixed order, and the parts involved are unable to appear on their own (e.g. **ed-paint, *ed!*) and cannot be focused individually (apart from metalinguistic correction as in *I said she paintED*). Syntactic relations, by contrast, generally allow (some) re-ordering (*will she paint?*), the parts involved can appear on their own (*she will*) and can be focused (*she WILL paint!*). Moreover, they may involve case government and/or agreement.

Synthesis is independent of phonological (or prosodic) **fusion** (on which see chapter 20): words can phonologically cliticize to other words, but this is not synthesis. The English auxiliary word *will*, for example, typically cliticizes to preceding NPs (cf. *she'll*

paint), but the relationship between *'ll*, *she,* and *paint* is still syntactic, and from the point of view of syntax, there are still the same three words as in the non-cliticized version (*she will paint*).

Likewise, what is a single synthetic word from the point of view of syntax can be composed of several distinct phonological words, but that does not make it any less synthetic. In Hakha Lai (Tibeto-Burman; Myanmar; Ken VanBik, p.c.), for example, the future tense marker *làay* synthesizes with verbs: unlike an individual syntactic word, *làay* cannot be re-ordered and it cannot be used alone, without a verb. However, *làay* is still a separate phonological word: like all other phonological words, and unlike clitics in Lai, it contains two moras and bears a tone. Thus a string like *a-nii làay* [3SG-laugh FUT] 's/he will laugh' is one single synthetic word though prosodically two words. (This word form also includes the agreement prefix *a-*.) (The difference between phonological fusion and synthesis is further discussed in Bickel 2003, Bickel and Nichols 2005.)

For phonologically separate particles like the Hakha Lai future tense marker, available descriptions sometimes make it difficult to establish whether or not these particles synthesize with another word. In our survey we made the default assumption that phonologically separate particles are also syntactically separate, i.e. that they do not synthesize. But when these particles manifest clear morphological dependency, e.g. when they cannot be used alone, or when their position is rigidly adjacent to words and this rigid placement contrasts with relatively free word order, then we took this as evidence for synthesis. The contrast between synthesizing and non-synthesizing particles can be illustrated by negation particles in mainland Southeast Asia. In Hmong Njua (as well as in Burmese, Sgaw Karen, Hakha Lai, and presumably Thai), negation particles are strictly adjacent to and dependent on verbs (Harriehausen 1990). But in Mandarin (and similarly in Vietnamese), placement of the negation particle *bu* is determined by syntactic principles

of phrase structure and by semantic principles of scope. Syntactically, *bu* must be adjacent to the verb phrase (but not necessarily to the verb). Semantically, *bu* precedes whatever is negated. Compare the following examples:

(1) Mandarin (Li and Thompson 1981: 420)

    a.   *Tā   tiāntiān   bu   xǐzǎo.*
         3SG   daily   NEG   bathe
         'Every day she does not bathe.'

    b.   *Tā   bu   tiāntiān   xǐzǎo.*
         3SG   NEG   daily   bathe
         'She does not bathe every day.'

In (1a), *bu* negates the bathing (and the time specification is presupposed); in (1b), *bu* negates the time specification (and the bathing is presupposed). In both cases, *bu* is adjacent to a VP (*xǐzǎo* 'bathe' in 1a, *tiāntān xǐzǎo* 'bathe daily' in 1b). Sentences like (1b) are ungrammatical in Hmong Njua (Harriehausen 1990: 173) because the negation particle must be adjacent to the verb.

2.   Surveying inflectional synthesis of the verb

Our survey concentrates on the synthesis of inflectional categories with verbs. By inflectional category we understand any grammatical category whose presence or shape is (at least in part) a regular response to the grammatical environment. The prime candidates for this are categories like agreement, tense/aspect/mood, evidentials/miratives, status (realis, irrealis, etc.), polarity (negation), illocution (interrogative, declarative, imperative), and voice (including Austronesian-style verb orientation). Often, these categories are sensitive to the syntactic environment (e.g. argument NPs in the case of agreement, sequence of tense rules in the case of tense, cross-clausal anaphora in the case of voice, etc.). But often, the

grammatical sensitivity is more narrowly morphological: different evidential or tense forms, or negative vs. affirmative forms, may imply different paradigms, or combine with different sets of aspect forms, or voices, etc. (see Bickel and Nichols 2005 for discussion).

While information about morphological sensitivity can usually be gleaned from basic descriptions, data on syntactic sensitivity is often unavailable. We made the default assumption that unless there is positive evidence for any kind of grammatical sensitivity of the category, it is not inflectional but derivational.

Apart from the better-known and common inflectional categories, the following categories proved to have verbal inflectional reflexes in at least one language: nominalizers, connectives or switch-reference markers (as in Belhare, Kiowa, Fijian, Daga, Maricopa), inverse marking (as in Plains Cree, Mapudungun or Chukchi) or Kartvelian-style "version", honorificity (as in Japanese or Korean), pluractionals and other quantificational categories (multiple argument or multiple action, as in Wichita and Koasati, or repetition marking, as in Karok), verb focus or emphasis (as in Maricopa, Pirahã, or Imonda), transitivity markers (as in Fijian, Plains Cree, Krongo, or Hakha Lai), reciprocal affixes (triggered by agreement with free reciprocal pronouns, as in Chamorro), construct marking (indicating the presence of a dependent NP, as in Hausa, Lango, and Supyire), object classifiers (inflectional if interacting with agreement, as in Imonda), nonspecific reference-marking (in Koasati), scope (delimiting the scope of other categories, as in Mezquital Otomí), deixis (judged inflectional in, e.g., Lango because it interacts with agreement paradigm rules), and motion (judged inflectional in Yagua and Imbabura Quechua).

In addition, causatives were judged inflectional in some languages, where these categories are regular responses to specific contexts (e.g. a response to specific types of switch-reference patterns as in Ingush) or where they are worked into

the same paradigms as regular voice values (e.g. in Chamorro, Fijian or Malagasy).

3.   Measuring synthesis

Within the same language, verbs can be used with more or less synthesis: the English past, for example, is more synthetic than the future. For surveying purposes, we looked for the **maximally inflected verb form**, i.e. the one form that is most synthetic, and determined its **category-per-word value** ("cpw value"). In English, the maximally inflected verb form expresses two categories: agreement (in the present: *-s*) and tense (past: *-ed*). The English verb therefore has a synthesis degree of 2 cpw (=categories per word). At one extreme in the sample is Vietnamese, where we found no evidence for any synthetic inflectional category in the verb. The maximally inflected verb in Vietnamese therefore has 0 cpw. At the other extreme are languages like Koasati, whose inflected verb forms can include up to 13 cpw.

In some languages, the same or a similar category can be expressed at various places in the verb. When these places were sufficiently distinct, we counted the category twice (or more). An example of this is number- or pluractional-marking on the stem in addition to affixal number agreement. Another example is certain kinds of aspect in addition to other kinds of aspect-marking.

On the other hand, when two (or more) semantically related categories cumulated into one single inflectional slot or morpheme, we counted this as one category (see chapter 21 on exponence). In particular, unless tense, aspect, and mood were clearly distributed in distinct positions, we counted these as one category (thereby avoiding difficult decisions as to whether something is aspect or tense or mood). When categories were not related, however, we treated them as distinct. Hence, cumulated exponence of agreement and tense, as in German

and other Indo-European languages, was coded as two categories. All these issues can be illustrated by an example from Kewa (Engan; Papua New Guinea):

(2)   Kewa (Franklin 1971: 49f.)
   a.   *íri-b-e*
          cook-INCEPTIVE-1.SG.PERF.EGOCENTRIC
          'I have begun cooking it'
   b.   *íra-paa-ru*
          cook-COMPLETIVE-1.SG.PST.ALTROCENTRIC
          'I finished cooking it (for someone)'
   c.   *íra-wa-de*
          cook-1SG.PST.EGOCENTRIC-PUNCTILIAR
          'I cooked it'

In such a case, we disregard the issue of whether the perfect is more a tense or an aspect (or neither) and simply count this as one category ("tense-aspect"). This category cumulates with agreement and diathesis-marking (called altrocentric vs. egocentric benefaction, but akin to active vs. middle voice). Since agreement and diathesis are not related to tense-aspect, we count them each as one category. In addition to the perfect/past marking, there is an inceptive/completive/ punctiliar distinction. Since this is marked in a clearly separate position and shows different behavior from the perfect/past distinction, we count this as an additional, separate aspect category. The Kewa forms thus combine the 4 categories (aspect, tense-aspect, agreement, diathesis) shown here (plus polarity and evidentiality not shown here).

   Agreement was always counted as one category per role (subject agreement, object agreement, etc.), no matter how many features are affected by agreement. Thus, agreement in gender was counted the same way as agreement in person, number, gender, and honorificity, etc. When agreement cumulates with another, non-agreeing, category (e.g. tense-

aspect-mood, as in classical Indo-European), we counted both categories individually.

4.   Results and discussion

Given that we made default assumptions disfavoring synthesis (as noted above), the cpw values represented on the map are possibly judged lower in less well-described grammars than in the bettter-known languages. However, our survey showed that there is no correlation between the obtained cpw value and the quality of description, so we are confident that the obtained cpw values are a sufficiently reliable approximation to the worldwide distribution of different degrees of synthesis.

But individual cpw values are in many cases valid only within a confidence interval of around ± 1. In response to this, the map depicts cpw values as a scale in spectral colors:

@	1.	0–1 category per word	5
@	2.	2–3 categories per word	24
@	3.	4–5 categories per word	52
@	4.	6–7 categories per word	31
@	5.	8–9 categories per word	24
@	6.	10–11 categories per word	7
@	7.	12–13 categories per word	2
		total	145

From a worldwide perspective, the most common cpw values are between 4 and 8 (acounting for two thirds of the sample) and the universal mode is 4 (17.4%). Especially outside Africa and Australia, the distribution is geographically very uneven. In particular, Eurasia is dominated by low-synthesis languages and the Americas (especially North America) by high-synthesis languages.

Exceptions to the low synthesis average in Eurasia are found on the Pacific Rim and in the Himalayan and Caucasian mountain

zones. Without these three regions, Eurasia is relatively homogeneous and has low synthesis degrees. The values in the Caucasus, by contrast, include values of up to 11 cpw; in the Himalayas and on the Pacific Rim, of up to 8 cpw. These three geographical zones are **typological enclaves** (see Bickel and Nichols 2003 for theory and statistical analysis of this phenomenon). They are relic zones with deviations from the surrounding typological profile and these deviations can be very heterogeneous, as is the case, for example, in the Caucasus.

There is an outlier at the fringes of each Eurasian enclave: Turkish near the Caucasus and Lai near the southeastern foothills of the Greater Himalayas. The high synthesis of Turkish reflects a common trend throughout the Turkic language family (deep into Siberia). It seems that this family has not adjusted its typological profile to the Eurasian standard (perhaps because that profile was established before Turkic speakers started to move westward in the first millenium CE, and not enough time has since elapsed for Turkic to lose high synthesis degrees and therefore assimilate to the standard). Lai apparently reflects the typological profile of Tibeto-Burman before the great spread of this family into Southeast Asia. Outside the Kuki-Chin and a few other branches of Tibeto-Burman, this profile survives only in the archaic Kiranti group that is spoken in relatively isolated Himalayan mountain pockets.

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