

20. Fusion of Selected Inflectional Formatives

Balthasar Bickel and Johanna Nichols

Since its beginning in the 19th century, morphological typology has postulated a universal scale of less vs. more tightly packed word forms. The scale ranges from **isolating** to **agglutinative** to **fusional** to **introflexive**, and is canonically exemplified by Chinese (isolating), Turkish (agglutinative), Latin (fusional), and Modern Standard Arabic (introflexive). Recent research has shown that such a scale conflates many different typological variables and incorrectly assumes that these parameters covary universally (see Plank 1999, Bickel and Nichols 2005, among others). Three prominent variables involved in this are phonological **fusion**, formative **exponence**, and **flexivity** (i.e. allomorphy, inflectional classes). In this chapter we concentrate on fusion. For exponence, see chapter 21, and for one aspect of flexivity, see chapter 59 (on possessive classification).

1. Defining fusion types

Fusion refers to the degree to which grammatical markers (called *formatives* in the following) are phonologically connected to a host word or stem. There are three basic values: isolating, concatenative, and nonlinear.

Isolating formatives are full-fledged phonological words of their own. In Fijian, all formatives with more than one mora are isolating. An example is the past tense formative *aa*:

(1) Boumaa Fijian (Dixon 1988: 53)

<i>Au</i>	<i>aa</i>	<i>sol-i-a</i>	<i>a=niu</i>	<i>vei</i>	<i>ira.</i>
1SG	PST	give-TR	ART=COCONUT	to	3PL

‘I gave the coconut to them.’

Concatenative formatives are phonologically bound. They need some other host word for their pronunciation and form one single phonological word together with that host. The usual effects of this are that concatenative formatives cannot be individually stressed, and that the combination of formative and host undergoes various phonological adjustments. The past tense marker of Turkish, for example, undergoes vowel harmony and assimilates in consonant voicing to the host stem. Thus, the past tense formative is *-ti* after a stem with unrounded front vowels and a voiceless final consonant (e.g. *git-ti* 'go-past'), *-tɪ* after a stem with unrounded back vowels and a voiceless final consonant (e.g. *yap-tɪ* 'do-past'), *-di* after a stem with unrounded front vowels and a voiced final consonant (e.g. *gel-di* 'come-past'), and so on. A subset of concatenative markers is constituted by cliticized words. The Spanish object marker *a*, for example, is syntactically a word (preposition) but phonologically it is a clitic and thus concatenative.

Once the phonological alternations are properly analyzed, strings of concatenative formatives can be segmented into clear-cut morphemes. **Nonlinear** formatives are not amenable to this because they are realized not in linear sequence but by direct modification of their host. In our sample, we found two subtypes of nonlinear formatives: **ablaut** and **tonal**. Modern Hebrew illustrates the ablaut type. The past ("perfect") vs. future ("imperfect") opposition, for example, is expressed by (i) the choice of a stem template (e.g. *CaCVC* in the past, *CCVC* in the future) and (ii) the choice of agreement affixes (entirely suffixes in the past, mostly prefixes in the future).

(2) Modern Hebrew (Orin Gensler, p.c.)

- | | |
|--------------------|-------------------|
| a. <i>šamar-ti</i> | b. <i>ʔe-šmor</i> |
| guard.PST-1SG.PST | 1SG.FUT-guard.FUT |
| ‘I guarded’ | ‘I will guard’ |

Neither affix nor stem choice appears to be basic. Tense is not marked in this language by an extractable morpheme but by the complete affix-plus-stem pattern as a whole. For purposes of this survey we call this *ablaut morphology*.

Suprasegmental nonlinear formatives chiefly involve tonal modification. In Kisi (Atlantic; Guinea), most tense-aspect oppositions are expressed by tone, and tone alone:

(3) Kisi (Childs 1995: 220ff.)

- a. ò cìmbù.
 3SG leave.PRES.HABITUAL
 'She (usually) leaves.'
- b. ò cìmbú.
 3SG leave.PST.PFV
 'She left.'

Here, present habitual is expressed by low tone on the last syllable (3a); past perfective is expressed by high tone (3b).

2. Sampling procedure and feature values

Languages were surveyed for the case and tense-aspect-mood exemplars as defined in the section on "Sampling case and tense formatives" (see box in this chapter). Nearly 90% of the languages in our sample have the same values for case and tense-aspect-mood, and therefore we combined the two values into one overall value:

@	1. exclusively concatenative	122
@	2. exclusively isolating	16
@	3. exclusively tonal	3
@	4. tonal/isolating	1
@	5. tonal/concatenative	2
@	6. ablaut/concatenative	5
@	7. isolating/concatenative	13
	total	162

Mixed types mean that case and tense–aspect–mood differ from each other, and the type list exhausts what combinations are attested in our sample. In a few instances, however, mixed types refer to languages where there is conflicting evidence for the fusion type of at least one of the formatives. Conflicting evidence is found, for example, in Lakhota (Siouan; North and South Dakota), where the future tense marker *-kta* is part of the same phonological word as the verb stem with regard to morphophonological rules, but not apparently with regard to syllabification (see Russell 1999 for careful discussion). Other instances of conflicting evidence that we found include Beja, Thai, Chamorro, and Gooniyandi.

The color scheme on the map is set up so as to highlight the presence of some isolating and the presence of some nonlinear formatives.

3. Results and discussion

Most of the languages in our sample (75%) rely exclusively on concatenative morphology for case and tense–aspect–mood. Languages with some isolating or nonlinear formatives are much rarer and have limited areal distribution.

Languages with isolating formatives, or traces of isolating structure in mixed types, are mostly confined to the Sahel Belt of West Africa and to Southeast Asia and the Pacific. Apart from this, there are outliers in southern Africa (Khoekhoe), Australia (Gooniyandi), and the Americas (several instances).

In our sample, ablaut morphology is always mixed with concatenative morphology and appears as an African singularity limited to representatives of Afroasiatic (Hebrew, Egyptian Arabic, Middle Atlas Berber, Beja) and the Central Sudanic branch of Nilo–Saharan (Lugbara). Similarly, tonal morphology is also by and large restricted in our sample to African languages

(Niger–Congo and Nilotic). An outlier with tonal formatives is lau (Lake Plains; Papua, Indonesia).

Sampling case and tense formatives

There can be considerable variation in the morphological typology of different formatives in the same language (cf. Plank 1999), especially with regard to fusion (this chapter) and exponence (chapter 21). The Fijian example in the main text of this chapter illustrates in the same language an isolating tense marker and a concatenative transitivity suffix. In Brahui (North Dravidian; Pakistan; Andronov 1980), case and number are cumulated (i.e. expressed in a single formative) in the nominative, but in the accusative and other cases, number and case are each marked by specialized morphemes (where $-t(\bar{e})$ marks the plural; Table 1).

	SINGULAR	PLURAL
NOMINATIVE	<i>xal</i>	<i>Xal-k</i>
ACCUSATIVE	<i>xal-ē</i>	<i>xal-t-ē</i>
DATIVE	<i>xal-ki</i>	<i>xal-tē-ki</i>
ABLATIVE	<i>xal-ān</i>	<i>xal-tē-ān</i>

Table 1: Selected Brahui declension forms (*xal* ‘stone’)

This makes it impossible to typologize whole languages for fusion and exponence. In response to this, we sampled individual formatives, one case (or case-like) formative and one tense–aspect–mood (or tense-like) formative. The procedure was as follows (following Bickel and Nichols 2002):

- (i) If there is any difference in the morphological type across case formatives, pick the grammatical cases. Within

grammatical cases, pick accusative or ergative or agentive (or whatever is chiefly used on A or P arguments). If there is none of these, pick nominative or absolutive (if these are at all marked overtly). If neither the A nor the P argument of transitive clauses is identified as such by overt marking, or if case-marking is restricted to pronouns, assume the language has no "case".

- (ii) If there is any difference in the morphological type across tense-aspect-mood formatives, pick tense. Within tenses, pick past (or whatever is chiefly used for simple past time reference); if there is none, pick future; if there is none, pick present. If there is no tense, pick the closest aspect equivalent of past tense as a proxy. If there is no aspect, pick that mood, status, or evidentiality formative that is mostly used for past tense narration. If there is no grammatical marker for any of these notions, assume the language has no "tense-aspect-mood".
- (iii) For both case and tense-aspect-mood: if the marking is zero, pick the overtly marked opposite value of the category (e.g. the plural of nominatives, if the singular is zero-marked; or the future tense, if the nonfuture is zero-marked).
- (iv) For both case and tense-aspect-mood: if categories differ in their degree of grammaticalization, pick the most nearly grammaticalized one. Pick synthetic tense formatives over periphrastic ones.

Sampling of tense-aspect-mood as defined here was generally straightforward. The most common proxy for past tense was perfective or completive aspect (14 languages). In some language, the proxy was realis status (3 languages). In all other languages, tense-aspect-mood morphology was either morphologically homogeneous, or we could identify some dedicated form used for past tense reference.

The sampling procedure for case as defined here mostly

revealed ergatives and accusatives. As a result, a language like Brahui (see Table 1 above) will be coded as having a monoexponential case formative even though the nominative apparently cumulates case and number.

For Austronesian languages, we chose the nominative or “topic” form. This form, exemplified here for Tagalog, codes that argument role which the verb is oriented to.

(1) Tagalog (Kroeger 1993: 13)

- a. *Bumili ang=lalake ng=isda sa=tindahan.*
 PFV.A.buy NOM=man GEN=fish DAT=store
 ‘The man bought fish at the store.’
- b. *Binili ng=lalake ang=isda sa=tindahan.*
 PFV.P.buy GEN=man NOM=fish DAT=store
 ‘The man bought *the fish* at the store.’
- c. *Binilhan ng=lalake ng=isda ang=tindahan.*
 PFV.D.buy GEN=man GEN=fish NOM=store
 ‘The man bought fish *at the store*.’

The A vs. P vs. D(ative) orientation on the verb specifies the role of the nominative NP (marked by the proclitic *ang=* and given in italics in the translation).

A similar situation is found in Algonquian languages. Here, the NP marked by what is called the “proximative” (zero-marked in opposition to the “obviative”) codes that role which the verb is oriented to. Verb orientation is called “direct” vs. “inverse” marking by Algonquianists. The following example is from Plains Cree:

(2) Plains Cree (Wolfart 1973: 25)

- a. *Sēkih-ē-w nāpēw atim-wa.*
 scare-DIRECT-3 man.PROX dog-OBVIATIVE
 ‘The man scares the dog.’
- b. *Sēkih-ik nāpēw-a atim.*
 scare-INVERSE[-3] man-OBVIATIVE dog.PROX

‘The man scares *the dog*.’

The inverse vs. direct orientation specifies the role of the proximative as either A (in 2a) or P (in 2b).

Both Austronesian nominatives and Algonquian proximatives identify argument roles in interaction with verb morphology. Although these types of markers are not traditionally analyzed as case, they involve the same basic mechanism as case in languages traditionally assumed to have case: the semantic role expressed by a Latin or Russian nominative depends in part on whether the verb is active or passive (verb orientation).

When there are no markers identifying the roles of A and P arguments, we coded the language as having no case. Thus, in languages such as French, the only (non-spatial) argument role marker is a dative preposition (*à*) used for recipient and goal arguments of ditransitives (‘give’, ‘send’, ‘tell’, etc.). Languages like these were counted as having no case. But if datives or dative-like markers are also used to identify monotransitive objects, they were counted. Marking of monotransitive objects was also counted as case when it is used only on a sub-class of objects. An example of this is Turkish, where the accusative is used only with definite objects:

(3) Turkish (Lewis 1967: 35f)

- a. *Mavi kumaş-ı seç-ti.*
 blue material-ACC choose-PST[–3SG]
 ‘She chose the blue material.’
- b. *Bir mavi kumaş ist-iyor.*
 a blue material want-IMPF[–3SG]
 ‘She wants a blue material.’

Another example is Mandarin, where the formative *bǎ* identifies contextually salient, but not also other, objects:

(4) Mandarin (Li and Thompson 1981: 486)

- a. *Tā bào-zhe zāng yīfu.*
 3SG hold-DUR dirty clothes
 'S/he was holding dirty laundry.'
- b. *Tā bǎ zāng yīfu bào-zhe.*
 3SG OBJ dirty clothes hold-DUR
 'S/he was holding the dirty laundry.'

Our notion of case does not differentiate between full-fledged syntactic words (prepositions) and morphological affixes. Hence, the Spanish preposition *a* counts as case. It marks a subset of monotransitive objects.

Acknowledgements

This research was supported by U.S. National Science Foundation Grant No. 96-16448 (Nichols, P.I.), Swiss National Science Foundation Grants No. 08210-053455 and 610-062717 (Bickel, P.I.), and the Institute for Slavic, Eurasian, and East European Studies, UC Berkeley. We thank Aimée Lahaussois Bartosik, Dave Peterson, and Suzanne Wilhite for help with data collection.