

Rethinking lexical integrity: Phrase-level and word-level case morphology

Oleg Belyaev

Lomonosov Moscow State University/Institute of Linguistics RAS/
Pushkin State Russian Language Institute

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Abstract

In this paper, I provide a typological argument in favour of preserving lexical integrity in LFG, based on the behaviour of case markers in languages of the world. I demonstrate that case systems that conform to the definition of morphological case (m-case) as proposed in work by Otaguro and Spencer cannot have phrasal scope; conversely, only m-cases may trigger NP-internal concord. I interpret these findings as pointing to a principal distinction between morphology and syntax, with the domain of morphology limited compared to the traditional view: only features showing complex paradigmatic behaviour are truly morphological. I further evaluate three possible ways to account for this distinction in modern LFG (standard LFG, lexical sharing, L(R)FG), and conclude that, at present, none are fully acceptable.

1 Introduction

Lexical integrity has been a hallmark of LFG since its inception. The concept itself, however, is far from having a universally accepted definition, but there are two main formulations that are frequently used in the literature:

- (1) Words are built out of different structural elements and by different principles of composition than syntactic phrases. (Bresnan and Mchombo 1995, 181)
- (2) Morphologically complete words are leaves of the c[onstituent]-structure tree and each leaf corresponds to one and only one c[onstituent]-structure node. (Bresnan et al. 2016, 92)

The definition in (1) is rather broad and is compatible with a wide array of approaches, as long as *some* boundary between morphology and syntax is maintained. (2) is more specific in that it constrains possible analyses in a particular way: namely, it disallows empty nodes, terminal nodes occupied by affixes or features, and words mapping to more than one preterminal (category) node. However, the notion *morphologically complete word* is treated as a theoretical primitive; it is not clear which criteria can consistently distinguish between words and bound morphemes in a cross-linguistically uniform way. There has been surprisingly little discussion of this problem in LFG. Bresnan and Mchombo (1995) provide a number of diagnostics for lexical integrity (LI), namely extraction, conjoinability, gapping, inbound anaphoric islands, and phrasal recursivity. However, all

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these criteria are problematic because, as shown by Haspelmath (2011), there is no single criterion or set of criteria that can capture linguists' actual use of the term 'word'; the continuum between words and phrases does not seem to show any consistent clustering either. Even within one language, elements defined as words according to some criteria may fail to meet other criteria.

One example of how lexical integrity can be problematic is the phenomenon of so-called phrasal or suspended affixation, such as that found in Turkish:

(3) Turkish (Turkic < Altaic)

[*Almanya ve Amerika*] **-dan**

Germany and America -ABL

'from Germany and America' (Kabak 2007, 335)

Assuming lexical integrity, the existence of such phenomena leads to a contradiction. Case and number affixes certainly pass all criteria for affixhood in Turkish: they obey vowel harmony and receive stress, unlike clitics, some of which do follow harmony but which are all unstressable (Göksel and Kerslake 2005, 100). Therefore, they should be treated within the morphological domain according to the principle (1), i.e. that rules for assembling words are different from rules for assembling syntactic phrases. But examples like (3) show that case affixes may scope over coordinate phrases, attaching to their rightmost word. This suggests that their behaviour is more akin to that of clitics than affixes, i.e. (3) can be analysed as a Case head that has a coordinate NP as its complement. Conjoinability has been explicitly listed in Bresnan and Mchombo (1995) as a criterion for distinguishing syntactic phrases from word parts. Hence, either case markers should arbitrarily be considered to be clitics – thereby blurring the distinction between morphology and syntax – or the lexical integrity principle should be abandoned or at least relaxed, admitting such notions as “phrasal affixation” or “group inflection”. Both conclusions severely weaken the notion of lexical integrity.

Bruening (2018) lists a number of other counterexamples to lexicalism involving phrasal syntax feeding word formation, i.e. words formed from syntactic phrases, such as *a ne'er-do-well* or *a shoot-'em-up* in English; and phrasal syntax having access to sub-word units, such as coordination of word parts, of which (3) is the most clear example, but which is also found in English, as in *pro-choice and -gun control* (Chaves 2008, 263).

Such contradictions may indicate that notions like “word” or “affix” are indeed theoretically problematic: if wordhood criteria do not serve as reliable predictors of any syntactic behaviour, a strict separation between morphology and syntax seems unnecessary and arbitrary. In the context of LFG, this is in fact perfectly possible: nothing in the framework hinges specifically on lexical integrity. And, indeed, at least two such attempts have been made. Lexical sharing (Wescoat 2002; Broadwell 2008; Lowe 2016) allows one violation of lexical integrity as understood in (2): a single morphological word may be associated with two adjacent heads. All other principles of lexicalism are preserved; importantly, the sharing pattern

itself is defined in the lexicon, and so, the basic division between morphology and syntax is supposedly retained.¹ A more radical option is a new variant of LFG called L(R)FG, for “Lexical (Realizational) Functional Grammar” (Melchin, Asudeh, and Siddiqi 2020), essentially a hybrid of DM and LFG. In this approach, lexical entries represent morphemes that are mapped directly to terminal nodes of the c-structure tree. Like in DM, morphology is only in the mapping between f-descriptions (that are found in terminal nodes) and the lexicon; there is no lexical morphological component.

Therefore, lexical integrity for LFG is, primarily, an empirical question: if it can be demonstrated that some definition of morphology predicts an impenetrability to syntactic processes, lexical integrity can be preserved. It is now clear that the traditional assumptions of wordhood and affixhood do not translate to consistent syntactic predictions either cross-linguistically or language-internally. However, wordhood and bondedness do not have to play a central role in the morphology–syntax distinction. After all, modern morphology is not so much about morphemes (cf. Anderson 1992); neither is it much concerned with the definition of wordhood. Rather, morphological theory mainly works with paradigms and relations between their elements; the validity of its results is hardly dependent on our definitions of words and morphemes, or lack thereof. For instance, the results of such studies as Baerman, Brown, and Corbett (2005) on syncretism and Corbett (2007) on suppletion hold regardless of which diagnostics for wordhood are valid in the languages included in the sample.

The aim of this paper is to test whether morphological complexity – broadly understood as in Baerman, Brown, and Corbett (2017), i.e. as the existence of intra-paradigmatic relationships that go beyond concatenation – can serve as a better predictor for LI-consistent behaviour than bondedness in terms of word- or affixhood. In other words, if it can be shown that certain patterns of morphosyntactic expression (those that require reference to the notion *paradigm*) predict syntactic impenetrability (e.g. the diagnostics described in Bresnan and Mchombo 1995), LI can be maintained as a useful principle of grammar. However, its scope will have to be strongly restricted.

Of course, this hypothesis is difficult to test in its entirety because, as it stands, its formulation is too general; furthermore, its scope covers all kinds of morphology (inflectional and derivational) which are clearly outside the scope of a single study. Therefore, in this paper I focus on one particular morphological phenomenon that is relatively well-understood and well-represented in grammars: case systems. My point of departure is the notion of *morphological case* (m-case) as formulated in Spencer and Otaguro (2005), Otaguro (2006), and Spencer (2005). Spencer and Otaguro claim that the *morphological* feature CASE should only be defined for languages where “case” marking (i.e. any kind of nominal dependent

¹How lexical sharing should be integrated in the morphological module is another question. One possibility is described in Belyaev (2021) for PFM (Stump 2001), based on the morphology–syntax interface model in Dalrymple (2015).

marking – *flagging* in terms of Haspelmath 2019) involves certain kinds of morphological complexities. For other languages, at best, only a syntactic feature CASE should be used.

In Belyaev (2018), I hypothesized that it is only those case systems that obey the definition of m-case as per Spencer and Otaguro which necessarily obey LI. Other “case systems”, regardless of their description in grammars as affixes or clitics, may behave as separate syntactic heads scoping over noun phrases. This is, in effect, an implicational universal $M-CASE \rightarrow \neg GROUP$, where GROUP is the ability to mark the edge of a noun phrase. Conversely, my second hypothesis is that it is only m-case systems that can display NP-internal concord.² Based on a pilot sample of 107 languages, both hypotheses are confirmed, although the latter less strongly so because of low occurrence of case concord in the sample in the first place. From this typological observation, I argue that any approach that involves a clear boundary between “lexical” morphology and syntax (such as traditional LFG or LFG with lexical sharing) is preferable to an approach that collapses the boundary between morphology and syntax in its entirety.

The paper is organized as follows. In section 2, I describe the approach of Spencer and Otaguro, the notion of m-case and how it can be used as the basis for a typological treatment of lexical integrity. In section 3, I present the result of a preliminary typological study that defines m-case as a comparative concept and confirms two putative universals that connect m-case status with the lack of group affixation and the possibility of NP-internal concord. In 4, I discuss the implications of these findings for LFG.

2 Case systems

Spencer and Otaguro (2005), Otaguro (2006), and Spencer (2005) based their analysis of case systems on Beard (1995), who proposed that case systems should only be stipulated for those languages where the morphology is complex enough to warrant a *morphological* feature CASE. In Spencer and Otaguro’s interpretation, this criterion, which they call BEARD’S CRITERION, is that morphological case (M-CASE) should only be postulated if the connection between syntactic case features/functions and their formal exponents is more complex than just a one-to-one mapping. Examples from Otaguro (2006) are particularly illustrative.

²In fact, case concord is treated as one of the *criteria* for m-case status in Otaguro (2006). However, concord in a syntactic case feature is perfectly conceivable – for example, preposition concord, although mainly optional and restricted, was found in Old Russian (see Klenin 1989). Therefore, I treat m-case status and concord as independent variables.

<i>Stem</i>	<i>Affix</i>	<i>Category</i>	<i>Function</i>
Class 4	-∅	NOM	Subject
Class 1	-a		Object
Gen II	-u	GEN	Quan. Object
Classes 2-3	-i		Partitivity
Class 4 (Pl)	-ov		Possessivity
Class 4 (Pl)	-ej	INS	Punctuality
Fem. Adj.	-oj		Possession

Figure 1: Russian case system according to Otoguro (2006)

A system like Russian (Figure 1) clearly requires reference to a morphological feature CASE. Indeed, no direct mapping between syntactic function and morphological exponence can be established: the latter is dependent on number (due to consistent case-number cumulation) and inflection class. For example, the suffix *-a* can be associated with two feature sets, which, in turn, are associated with different syntactic functions: genitive singular (in the *-a* inflection class) and nominative plural (in neuter nouns of the consonant-final inflection class). It is impossible to assign *-a* a single set of syntactic features or functions for all contexts; which of the two sets is used depends on the inflection class of the head noun.

<i>Affix</i>	<i>Category</i>	<i>Function</i>
-QYŋ	GEN	Partitivity
		Material
		Possession
-∅	NOM	Subject
		Object
		Goal
-NY	ACC	Punctuality

Figure 2: Bashkir case system according to Otoguro (2006), variant 1

Bashkir, like other Turkic languages, is different. In this language, the mapping between syntactic function and affix exponence is always one-to-one; what variation there is is explicable from morphonology. Hence, while it is possible to provide a “Russian-like” mapping, as in Figure 2, it seems more economical to assume that affixes are directly associated with specific syntactic functions, as in Figure 3. Thus, instead of “genitive” or “accusative”, Bashkir “cases” can be re-

ferred to as the “-QYŋ-form”, “-NY-form”, etc. This makes such case markers not much different from adpositions – even though they are affixes from the point of view of Bashkir grammar. Bashkir may still require a *syntactic* case feature; the point that Otoguro makes is that a case feature is not required for a *morphological* description of Bashkir.

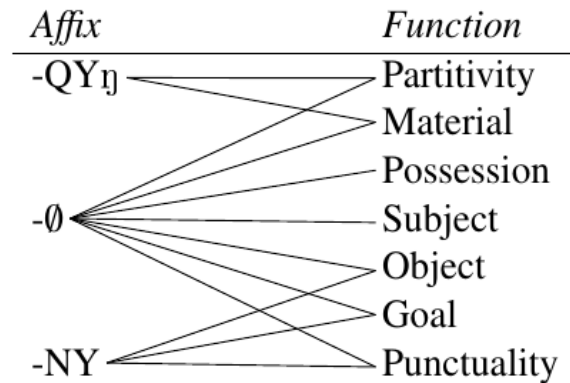


Figure 3: Bashkir case system according to Otoguro (2006), variant 2

Spencer and Otoguro’s observations are very valuable, but they are mainly concerned with morphological theory; they do not claim that m-case should correlate with any syntactic behaviour. Moreover, they start from the assumption that all exponents involved are affixes (since adpositions or other kinds of syntactic case markers cannot, by definition, introduce m-case features); the differences are in the morphological features they realize. What I propose in this paper is to essentially reverse the argument, taking m-case status as a starting point and seeing whether it predicts syntactic behaviour consistent with LI. If this is true, pre-syntactic (lexical) morphology should be retained in the theory, but its domain, at least as far as case is concerned, should be limited: only m-case should be treated in the morphology. Other “case” markers can be dealt with in the syntax. This would follow the standard LFG division of labour between morphology and syntax, confirming its cross-linguistic validity; analyses of individual “case” markers, however, may have to be reconsidered in light of these findings.

3 Typology

This typology mainly repeats the finding earlier reported in Belyaev (2018), with certain minor additions and modifications.

3.1 Formulating the concept

One of the key components of a typological study is providing clear definitions of the parameters involved. Statements in descriptive grammars characterizing markers as “cases” or “adpositions” cannot be taken at face value: the set of criteria that the authors had in mind is often vague and is usually based on the traditional idea of wordhood or bondedness, as opposed to the paradigm-based notion of m-case. Directly applying Beard’s Criterion is not an option either:³ This requires a detailed morphosyntactic analysis of a language’s case system, such as the ones in Otaguro (2006), which is not feasible for any sample of a substantial size. Therefore, Beard’s Criterion should be reformulated as a comparative concept (in terms of Haspelmath 2010) that is applicable cross-linguistically and testable based on data that are easily obtainable from published sources. To this end, I will rely on three criteria that, if observed in a case system, unambiguously classify it as an m-case system and are sufficiently well-defined in prior typological work:

syncretism (SYNC) “a single inflected form [corresponding] to more than one morphosyntactic description” (Spencer 1991, 45);

cumulative exponence (CUMUL) encoding of more than one grammatical feature, or a lexical meaning together with a grammatical feature, by a single exponent (Bickel and Nichols 2013);⁴

inflection classes (INFL) lexically conditioned variation in case exponence.

I assume that, if a case system demonstrates **at least one** of those, it is an m-case system. Thus:

(4) $\text{BEARD} \equiv \text{SYNC} \vee \text{CUMUL} \vee \text{INFL}$

Importantly, the definitions should be independent of affix/word status, because the goal here is to replace traditional notions of wordhood and affixhood, rather than augment them. Therefore, unlike Baerman, Brown, and Corbett (2005), I include any **system of basic NP flags** (i.e. markers that can attach to NPs lacking other dependent marking, see Haspelmath 2019) in the sample. Thus, in Russian, case+number affixes like *-om* in (5a) will be considered. In Japanese, I will consider “case” clitics such as genitive *no* and dative *ni* (5b), although they are not affixes according to most descriptions of Japanese.

³An anonymous reviewer wonders why Beard’s Criterion cannot be applied directly if it simply means “complex morphology indicating case”. But the notion of “complex morphology” depends on the analysis of the language in question. For example, seemingly cumulative exponence of inflectional features may be due to regular phonological processes erasing the boundary between two morphemes in particular environments. Similarly, lexical variation should be described in terms of inflection classes only if it does not follow from regular phonological rules.

⁴An anonymous reviewer suggests that cumulative exponence implicitly relies on a morpheme-based view of morphology. I am not sure that the notion is incompatible with all word-and-paradigm approaches, however. For example, in PFM (Stump 2001), realization rules targeting more than one feature may be viewed as involving cumulative exponence (although the “exponents” themselves do not exist as theoretical objects as such).

- (5) a. Russian (Slavic < Indo-European)
 [PP *nad* [NP *dom-om*]]
 above house
- b. Japanese (Japonic < Altaic)
 [[[[*ie* NP] *no* KP] *ue* NP] *ni* KP]
 house GEN above DAT
 ‘above the house’

3.2 Syntactic parameters

3.2.1 The hypothesis

As stated above, I test two hypotheses on the correlation between the morphological status of case and its syntactic expression. One is that m-case status is incompatible with group marking; that is, $\text{GROUP} \rightarrow \neg \text{M-CASE}$. The other is that case concord is only compatible with m-case status: $\text{CONCORD} \rightarrow \text{M-CASE}$. In the former case, I assume that group marking is handled via locating the affix in a higher projection like KP, as in Broadwell (2008), or as an adjunct to NP, as in Spencer (2005) and Belyaev (2021), which scopes over both conjuncts. This, by definition, is incompatible with the notion of case as a lexically expressed, morphological feature, which m-case is supposed to represent. The latter hypothesis is less obvious; my assumption is that concord is only possible in grammatical *features*, not in *form*;⁵ an adjective may agree with its head in a genitive case feature, but not in “-*Qyη*-form” or in the preposition *of*.

Both parameters represent facts that are usually reflected in descriptive grammars in one form or another. However, what exactly counts as group marking or concord is a non-trivial question. In the following section, I will provide empirical definitions of both that can be unambiguously identified in languages.

3.2.2 Group marking

I assume that group marking occurs whenever a case marker (flag) occurs at the edge of NP rather than at its head. Prenominal markers in head-final languages and postnominal markers in head-initial languages are thus uncontroversial. For example, English prepositions uncontroversially mark phrases rather than heads because they precede the NP regardless of what constituent begins it (6a). In contrast, Russian case and number suffixes always mark the head, even if it is followed by another modifier (6b).

⁵There has been discussion of “alliterative agreement”, i.e. true agreement in form, in some Bantu languages; see Corbett (2006, 87–90). Even if such genuine systems exist, they are expected to be rare. Note that all known claims are for agreement in gender/noun class, not case.

- (6) a. English (Germanic > Indo-European)
to [*John's friend*]
- b. Russian (Slavic > Indo-European)
 [*drug-u* *Vas'-i*]
 friend-DAT.SG Basil-GEN.SG
 'to Basil's friend'

But prefixes/proclitics in head-initial languages and suffixes/enclitics in head-final languages are less trivial, because in this case the head coincides with the edge of the phrase. Therefore, a more reliable criterion is the ability to mark the edge conjunct of *coordinate phrases*, such as in the following example from Nivkh, a head-final language:

- (7) Nivkh (isolate)
mañḍu+əs [*sək p'-umgu-gu* *p'-ōla-gu*] *-kir*
 Chinese+owner all REFL-woman-PL REFL-child-PL -INST
- lumr+uski-γət-ṭ*
 sable+pay-DISTR/INTS/COMPL-IND

'The owner of the Chinese **with** all his wives and his children paid for the sables.'
 (Nedjalkov and Otaina 2013, 56)

However, sometimes data on coordination is unavailable. In these cases, I relied on any evidence that shows flags marking an edge constituent that is not a head, such as in the following example from Sanuma, where the instrumental marker *-nō* marks the postnominal adjective rather than the head:

- (8) Sanuma (Yanomam)
 [*kamakali te wasu*] *-nō ipa ulu a noma -so -ma*
 high:fever 3:SG deadly -INST my son 3:SG die -FOC -CMPL
 'My son died from a deadly high fever.'
 (Borgman 1990, 123)

3.2.3 Case concord

Because it is difficult to distinguish concord from the use of two separate NPs, I only consider instances of **obligatory** case concord within a **continuous** sequence; thus, phenomena like the abovementioned Old Russian preposition repetition (Klenin 1989) are excluded, since they are not obligatory. Unlike group marking, case concord is relatively rare. It is mostly found in Eurasia (Indo-European, East Caucasian, South Caucasian) and Australia, but also in other areas:

- (9) Southern Sierra Miwok (Utian)
pakal-te-m ʔansi-nṭi-j [*oṭi-ko-j pe-so-j*]
 pay-VERB-1SG son-my-OBJ two-OBJ dollar-OBJ
 'I'm paying my son **two dollars**.' (Callaghan 1987, 22)

3.3 Sample

The sample I used for the pilot study in Belyaev (2018) is largely based on the intersection of the syncretism sample in Baerman, Brown, and Corbett (2005) (and the corresponding WALS feature Baerman and Brown 2013) and the WALS sample “Exponence of Selected Inflectional Formatives” (Bickel and Nichols 2013). I only exclude languages for which there is not enough data or no access to primary sources; in many cases I have included closely related languages instead. A few well-attested and well-described languages have also been added. In sum, the sample includes 107 languages with a fairly high level of genetic and areal diversity.⁶ It is illustrated in Figure 4 (where orange dots mark languages with m-case according to my criteria, and blue dots mark languages with no m-case). The map has been drawn using the `lingtypology` R package (Moroz 2017).

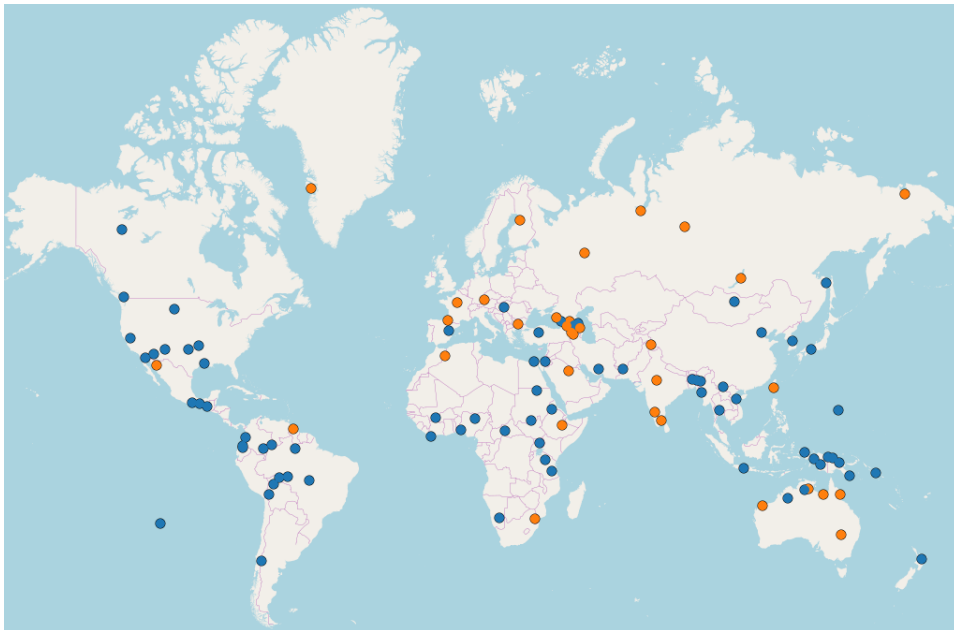


Figure 4: Languages in the sample

3.4 Results

3.4.1 Universal 1

The first hypothesis concerns the relationship between group marking and m-case status: group marking should be impossible in m-case systems.

- (10) $\text{GROUP} \rightarrow \neg \text{M-CASE}$
 $\text{M-CASE} \rightarrow \neg \text{GROUP}$

⁶An interactive map of the sample, where one can click to see language names, is available at: <http://ossetic-studies.org/obelyaev/case-sample-map.html>.

The hypothesis is strongly confirmed, with only three real exceptions, as seen in the contingency table in Table 1.

	\neg M-CASE		M-CASE	
GROUP	56	95%	3	5%
	76%		9%	
\neg GROUP	18	37%	30	63%
	24%		91%	

$\chi^2(1, N = 107) = 40.9059, p < 0.00001$

Exceptions: Basque (isolate), French (Romance), Burushaski (isolate).

Table 1: Contingency table for Universal 1

Note that many languages in the sample, such as Ossetic (Iranian > Indo-European, Erschler 2012), or Kryz (Lezgian > East Caucasian, Authier 2009, 34), or Oromo (Kushitic > Afro-Asiatic, Owens 1985, 8ff.) do have both group affixation and m-case features. But they are not exceptions because these languages actually possess two case systems: an m-case system, more tightly integrated, often covert, that does not scope over coordination, and an agglutinating, non-m-case system that does scope over coordination. For possible analyses of such mixed systems in LFG, see Belyaev (2014) and Belyaev (2021).

The remaining exceptions may be due to limitations in the typological methodology. For example, French counts as an exception due to cumulation of prepositions with definiteness, number, and gender: *au* [o] (to.DEF.M.SG) is not synchronically derivable from *à* ‘to’ + *le* (DEF.M.SG). Furthermore, [o] is syncretic with definite plural (orthographic *aux*). However, this depends on the morphophonological analysis. Furthermore, cumulation in French is “accidental”: it does not occur all across the paradigm, and non-cumulative exponents of both case and definiteness are easy to isolate (*à* can be used without an article, or with the feminine singular article – *à la*, etc.). This contrasts with systematic cumulation, such as between case, number and gender in Indo-European case systems (e.g. in Russian or German). Perhaps a distinction should be made between this “real” cumulation and portmanteaux like in French; however, such a distinction is difficult to formalize typologically, and since the exceptions are few anyway, this does not seem to be a serious problem.

Remarkably, there also seems to be a tendency in the opposite direction for non-m-case systems to possess group marking, although it is weaker than Universal 1. Furthermore, individual diagnostics for m-case status are different in their predictive power: INFL, taken alone, is exceptionless. This is in line with Spencer and Otaguro’s (2005) observation that inflection classes are the most reliable criterion for m-case status.

3.4.2 Universal 2

The second hypothesis is that case concord is only possible in m-case systems:

- (11) $\text{CONCORD} \rightarrow \text{M-CASE}$
 $\neg \text{M-CASE} \rightarrow \neg \text{CONCORD}$

This hypothesis is also confirmed, as seen in Table 2.

	M-CASE		\neg M-CASE	
CONCORD	17	89%	2	11%
	52%		3%	
\neg CONCORD	16	18%	72	82%
	48%		97%	
$\chi^2(1, N = 107) = 37.2353, p < 0.00001$				

Exceptions: Wardaman (Yangmanic), Southern Sierra Miwok (Utian).

Table 2: Contingency table for Universal 2

The statistical significance is high. However, the universal still looks less reliable than Universal 1, because the number of systems with case concord is low in the first place: only 19 in the 107-language sample. The sample should be extended in future work to cover more families and geographic areas.

A possible critique of this universal is that its consequent, M-CASE, is a disjunction between SYNC, CUMUL and INFL. This is not a problem for Universal 1, because a disjunction in the antecedent is actually more restrictive than a simple statement. But in Universal 2, it means that a violation of one of the three may be “saved” by the lack of violation of one of the others, thus weakening the universal. It should therefore be noted that, even when individual diagnostics are taken in isolation, the universal is still statistically significant, although the number of exceptions is higher.

3.4.3 Universal 3

A curious corollary of Universals 1 and 2 is a generalization which may be called a third universal:

- (12) A case feature in which there is concord cannot have group exponence.

That is, the following implication holds:

- (13) $\text{CONCORD} \rightarrow \neg \text{GROUP}$
 $\text{GROUP} \rightarrow \neg \text{CONCORD}$

This generalization seems obvious for the conventional view of group/phrasal affixation, where the affix literally attaches to the edge of a noun phrase (14); if affixes attach to adjectives, affixation should occur at the lexical level.

(14) [[ADJ N] CONJ [ADJ N]]-CASE

But there are other approaches to suspended affixation, treating it as ellipsis (Erschler 2012) or feature deletion (Kharytonava 2012). In this case, other options may be possible, such as (15), where the case marker occurs on the head and modifiers of the last conjunct but is absent (deleted) from all other conjuncts. Universal 3 predicts that such examples are impossible, and indeed, to the best of my knowledge, none are attested in the literature.

(15) [[ADJ N] CONJ [ADJ-CASE N-CASE]]

Thus, these findings support the conventional approach to group affixation. In the context of LFG, they also support the syntactic analyses of Broadwell (2008), Belyaev (2014), and Belyaev (2021) rather than a hypothetical edge feature passing approach along the lines of (16). The latter approach does not predict that case features are realized on the edge conjunct that coincides with the direction of attachment of the affix (prefixes attach to the first conjunct, suffixes attach to the last conjunct). It also does not explain why case features are always realized on edge conjuncts, and no systems marking, for example, penultimate conjuncts exist.

(16)
$$\text{NP} \rightarrow \text{NP}^* \text{ Conj } \text{NP}$$

$$\begin{array}{ccc} \downarrow \in \uparrow & \uparrow = \downarrow & \downarrow \in \uparrow \\ & (\uparrow \text{ CASE}) = (\downarrow \text{ CASE}) & \end{array}$$

4 Discussion

4.1 Implications for LFG

In my view, in the context of LFG, these typological findings support preserving lexical integrity in some form; that is, a distinction between lexical morphology and syntactic exponence of grammatical features. However, the latter is to be understood in a wider sense than in the conventional view that relies on language-specific wordhood diagnostics. Syntactic exponence should be treated as the “default”; lexical (morphological) exponence should only be assumed if there is evidence for effects that require resorting to morphology-specific mechanisms. In the domain of case, morphological systems are an obvious minority (33 languages in my sample); only they should be treated as introducing the feature CASE in the lexicon. All other “case” exponents, regardless of their status with respect to wordhood diagnostics or their descriptions in grammars, should be described as corresponding to separate heads in the syntax, as in the analyses of Broadwell (2008) and Belyaev (2021). This agrees with much of current LFG practice of dividing labour between morphology and syntax, but gives it a solid cross-linguistic justification. Another implication is that distinguishing between syntactic and morphological treatment of case markers should be based on Beard’s Criterion rather than diagnostics based on bondedness.

At the same time, the morphology–syntax distinction may still be viewed as redundant because it is not formally impossible to analyze *all* case marking phenomena syntactically. What I argue is that such an approach fails to explain the proposed typological generalizations, whereas they follow naturally from the distinction between (lexical) morphology and syntax. In the following, I would like to illustrate this point by analyzing one example from three different approaches that could be used within LFG.

4.2 The Kryz example

I shall consider the following example from Kryz (Lezgian > East Caucasian):

- (17) [*kasib-a sun-ci fur-a na xinib-ci*] *-ğar*
 poor-a one-OBL man-GEN and woman-GEN-SUPEREL
 ‘About a poor man and his wife.’ (Authier 2009, 199)

Within the framework proposed in this paper, Kryz has both m-case and non-m-case markers, which are both treated as “cases” in Authier (2009). The only m-case marker in Kryz is the genitive (*-a* and the second *-ci*⁷ in 17), which fits most of the m-case criteria: it has different forms in different inflection classes and it is sometimes syncretic with the nominative (i.e. zero-expressed). Other “case” markers, such as the superrelative *-ğar* in (17), attach to the genitive stem and have a consistent form across all lexemes, singular and plural.

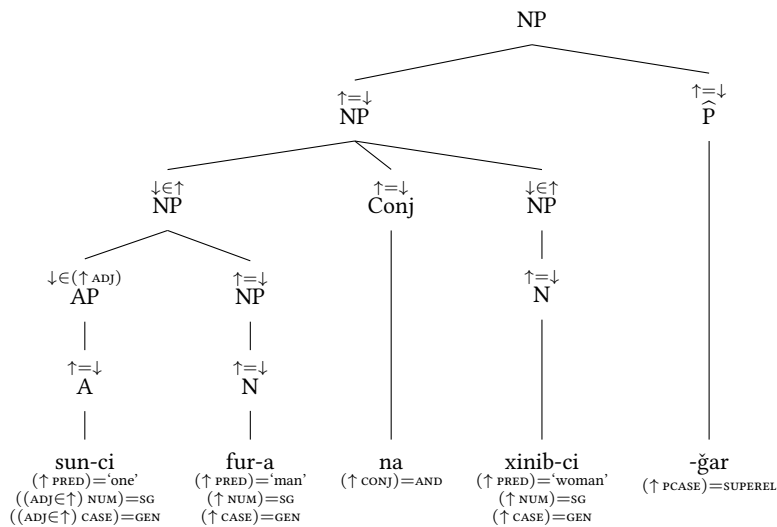
As expected, the genitive marker does not show group exponence; in (17), it appears on both conjuncts (as *-a* on ‘man’ and *-ci* on ‘woman’). In contrast, the superrelative *-ğar* scopes over both genitive-marked conjuncts. In accordance with Universal 2, case concord is only found in the genitive; that is, adjectives distinguish between nominative and oblique (recall that oblique cases are based on the genitive). For example, in (17), the numeral ‘one’ has the oblique concord suffix *-ci*, which is equivalent to the genitive affix on the noun ‘woman’. Therefore, Kryz is a paradigm example of all the typological generalizations and distinctions made in this paper.

The most straightforward approach would be to take the term “case” used in the grammar at face value and assume that all case marking is morphological, i.e. lexical. This will not work, because secondary cases like the superrelative scope over coordinate phrases. It is technically possible to analyze this via edge feature passing as in (16), but I have stated above why this approach is problematic from a typological point of view; furthermore, this requires treating secondary case as nondistributive, which will create additional problems, such as preventing proper case assignment to coordinate phrases (the set will be assigned a case feature that can be distinct from the features of its elements).

Secondary cases could be treated as clitics, such as in (18). On the analysis of “case” markers as \hat{P} , see Spencer (2005) on Hindi.

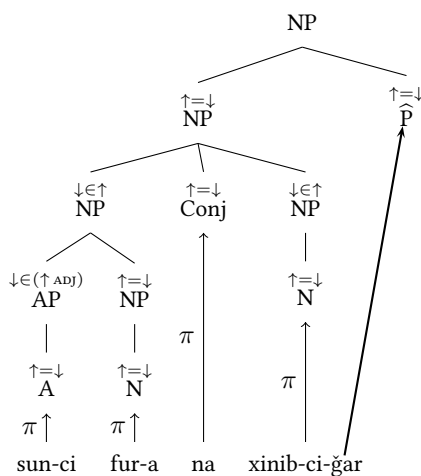
⁷The first *-ci*, on ‘one’, is glossed as OBL because it is treated as an oblique concord marker rather than a genitive case marker by Authier. The two are, of course, related.

(18)



This works as a technical solution, but it misses the fact that Authier (2009) treats elements like *-ğar* as cases for a reason: they morphologically pattern with affixes rather than clitics.⁸ If this evidence is to be taken seriously, a compromise would be to use lexical sharing (Wescoat 2002; Lowe 2016), as in (19), where the second conjunct co-instantiates the non-projecting \widehat{P} (case) node and the N node.

(19)



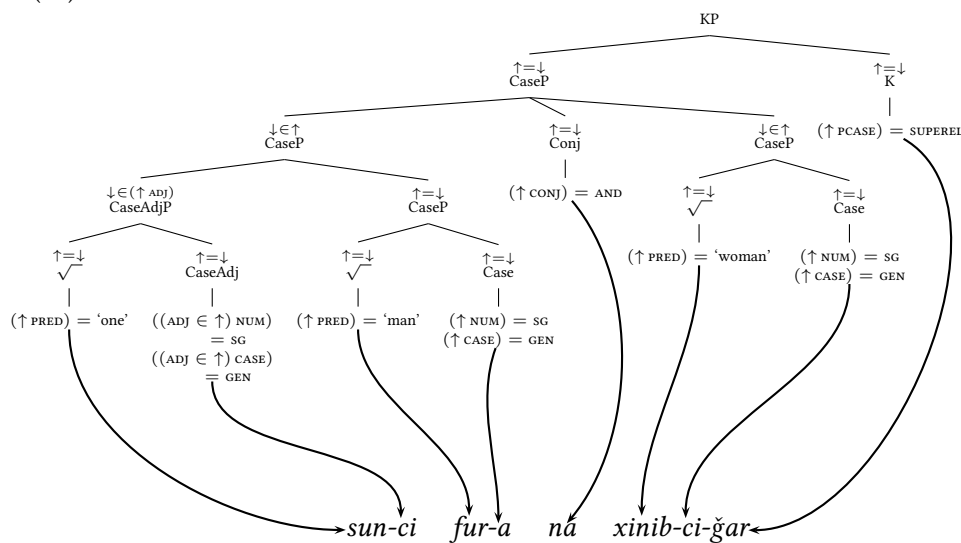
Lexical sharing is not without its problems, however. The most serious problem is that it fails to capture the typological generalizations provided above, namely, that m-case defies syntactic exponence, even through lexical sharing. Syntactic exponence is always affixal and agglutinating. Lexical sharing only specifies which f-description is assigned to which head, but does not capture the contribu-

⁸Authier (2009) does not explicitly discuss the criteria for treating these secondary cases as affixes rather than clitics, but these may be deduced from the data. For example, vowel hiatus is resolved with case markers: *k'ul-ci* (house-GEN) + inessive *-a* → *k'ul-c-a* 'in the house' (Authier 2009, 36), but *riki* (door.GEN) + *ara-c-a'ar* 'through' → *riki ara.c-a'ar* 'through the door' (Authier 2009, 96).

tion of individual morphemes; the internal structure of the word form is handled by the morphological component. Thus any features with any formal expression can be handled as lexically shared; generalizations like the ones presented in this paper either cannot be captured or must be captured through additional stipulations in the morphology itself.

Finally, a third alternative is to abandon LI (in its traditional form) altogether and treat all morphology as syntactically expressed. Such is the approach taken in L(R)FG (Melchin, Asudeh, and Siddiqi 2020). A sketch of an L(R)FG analysis of (17) is provided below:

(20)



The problem with this approach is that it completely collapses the morphological difference between the primary case markers and “secondary cases”. The fact that only the latter can undergo “phrasal affixation” cannot be explained by a morphology vs. syntax distinction. Rather, it has to be described as a constraint on coordination: KPs and Case(Adj)Ps can be coordinated, but not bare roots (there is no rule that coordinates bare roots). However, this is not realistically translatable to a cross-linguistic constraint, unlike the analyses above. It is not clear why the possibility of coordination would correlate with m-case status of the affixes: why are stems that host m-case markers non-conjoinable, while stems that host other case markers are?

However, this is not so much a feature of L(R)FG itself as a framework, but of its theoretical assumptions. Much like LFG does not have to be lexicalist, arguably, L(R)FG does not have to follow DM assumptions that every morpheme corresponds to a functional head. It is fully compatible with a lexical component, where some morphological features are realized together with the root; indeed, even now this solution must be taken for certain suppletive forms, such as English *my* and other possessive pronouns, to prevent forms like **me’s* or **you’s*. In

this spirit, L(R)FG can be used similarly to lexical sharing, assuming functional heads only where this is syntactically motivated by facts such as group affixation. One advantage over lexical sharing is an explicit mapping between exponents and their corresponding syntactic tree nodes.

5 Conclusions

In this paper, I have presented a typological argument, earlier presented in a more brief form in Belyaev (2018), in favour of lexical integrity based on the notion of (M-)CASE as formulated in Spencer and Otoguro (2005). This approach is based on the properties of the case paradigm and leads to more robust generalizations than prior definitions based on *words* and *affixes*. Specifically, two typological generalizations are shown to be statistically significant: first, m-case status predicts lack of group marking; second, case concord is only possible in m-case systems.

Therefore, in contrast to work such as Haspelmath (2011), the morphology-syntax distinction can be seen as cross-linguistically adequate. However, the scope of morphology is more narrow than traditionally assumed. Most kinds of nominal flag systems fall into the same class as adpositions, regardless of “bondedness”.

For LFG, this conclusion suggests that lexical integrity is a reasonable assumption. A natural explanation for the typological data is that flags adhering to Beard’s Criterion (m-cases) are always co-expressed at N heads and can never have syntactic expression. A theory that has no strict boundary between morphological and syntactic material fails to account for this.

But a conventional LFG approach that follows a strict definition of lexical integrity is also problematic, as some case affixes that correspond to syntactic heads nevertheless display properties of word-internal elements, and should not be treated in the same way as clitics or independent words. Two possible alternatives, which relax lexical integrity somewhat, are lexical sharing (Wescoat 2002; Lowe 2016) and L(R)FG (Melchin, Asudeh, and Siddiqi 2020). Both, in my view, are problematic: lexical sharing, because it does not model the association between specific affixes and syntactic heads, relegating all work to the morphology and thus allowing shared heads to have any kind of morphological expression; L(R)FG, because it completely removes the boundary between morphology and syntax and fails to provide a satisfactory explanation of the typological generalizations presented herein. A hybrid approach that has a place for both “syntactic” and “lexical” morphology, while providing clear criteria for separation between the two, would be preferable.

An interesting observation that emerges from these typological generalizations is that languages seem to prefer syntactic expression by default. Nothing prevents non-m-cases from being expressed in the lexicon, but they seem to predominantly favour expression in separate syntactic heads. One may speculate that lexical morphology is a “last resort” for language learners: the formation of

linguistic expressions is relegated to the lexicon only if the paradigm structure cannot be accounted for in the syntax.

This typological study, and its results, remain preliminary. The sample is not fully balanced, especially with respect to case concord: more data from other linguistic areas and language families should be included in order to make Universal 2 more reliable. The comparative concept is also too crude as it fails to distinguish between different kinds of cumulation (cf. the French example above), syncretism (phonologically motivated vs. systematic), and inflection classes (purely idiosyncratic vs. semantically motivated variation). This, however, is an inherent feature of the typological method, which has to rely on relatively coarse-grained concepts in order to achieve a large coverage of languages; it is the goal of the theory to provide the initial hypotheses and explain any exceptions.

Other typological parameters of case systems, such as case compounding, Suffixaufnahme, and affix order, may be considered as well, in addition to group marking and concord. However, it is not clear whether these phenomena are frequent enough in languages of the world to provide raw data for a robust typological study.

Finally, if my explanation of the observed universals is on the right track, similar observations should hold for other nominal features, such as number, and other word classes, such as verbs. Notions like m-case should be devised for these domains as well. Case, however, seems to be an appropriate initial testing ground, being a purely syntactic feature whose set of values is determined solely on the basis of its marking patterns.

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