

Chapter 2

Paradigms of paradigms

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This paper is concerned with inflectional morphology. Its point of departure is the old insight that paradigms of content categories are typically nested inside other paradigms forming hierarchical structures, e.g., case paradigms are included in number paradigms: CASE] NUMBER]. Similarly, say, in the Latin verb, PERSON] NUMBER] TENSE] ASPECT] MOOD] VOICE] (Section 1). As for exponence, paradigms (selectional sets) of inflectional classes (declensions, conjugations) are more often flat (linear) and asymmetrical with respect to one or more characteristics, e.g., meaning, stem shape, or productivity. But they may include selectional sets of allomorphs at a lower level, say, in individual cases or tenses, presenting paradigms in paradigms within paradigms (...) (Section 1.1). A third dimension in inflectional systems is the typological paradigm of morphological techniques commonly reflected in synchronic variation; English verb morphology, for instance, comprises analytic (*will call*, *got arrested*), agglutinative (*waded*, *jogged*), fusional (*kept*, *built*), and introflective (*sang*, *hung*) formations (Section 2.1). As additional examples of typological paradigms the conjugations of French, Latin, and Russian are examined (Sections 2.1–2.4). It is shown that such typological variation may reflect the historicity of an inflectional system. Since this variation is part of speakers' competence, it should be recognized as an inomissible part of synchronic description (Section 3).

1 Introduction

1.1 Content paradigm

The purpose of this paper is to draw attention to paradigmatic relations in inflectional morphology that have traditionally been overlooked. The background for this examination is the distinction between content paradigms and exponent paradigms. We begin with paradigms of grammatical categories.



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Quite naturally the notion of paradigm – what de Saussure (1959 [1916]) called associative relations – has historically implied a focus on grammatical content categories and their members. Saussure illustrated the notion with members of inflectional categories and derivational categories and, to include the exponent level, sets of homonyms. When Jakobson (1956b) characterized speech as a product of the dual processes of selecting and combining linguistic entities, the selectional sets he referred to were evidently paradigms of lexical and grammatical categories (see also Bloomfield 1933: 164; Hamp 1966, s.v. *selection*). Such categories serve well to illustrate the diversity of selectional sets.

Scalar paradigms perhaps best illustrate Saussure's understanding that linguistic categories are imposed on the world of experience and thereby shape our conceptual categories. Consider the colors in the world around us, which in the world of languages are represented by anywhere from two to a dozen simple color terms. The modern understanding of the hues of the color wheel has facilitated the identification of a multitude of colors. Their multifarious exploitation in design and fashion, as in interior decorating and in clothing, suggests that this perceptual dimension has a potential for infinitely differentiated paradigms of hues and subparadigms of shades, tints, and tones – through the imposition of color names (or code numbers). Many other scalar dimensions of experience are expressed with paradigms of contrary opposites, e.g., *large* vs *small*, *wide* vs *narrow*, *dark* vs *light*, *loud* vs *soft*, which are employed relative to explicit or implicit standards in both literal and metaphorical senses.

Graded (step-wise) categories are as common. The number words from *one* to *ten*, which recursively name units, tens, hundreds, thousands, and so on, illustrate how paradigms can be nested inside paradigms, in this instance ad infinitum; see (1). Decimal fractions of each whole number likewise form nested paradigms stretching to the infinitely small, a conceptual counterpart to the potentially infinite differentiation of the realm of colors.

- (1) UNITS] TENS] HUNDREDS] THOUSANDS] TEN-THOUSANDS] ...

Grammatical categories typically form paradigms of contradictory opposites. These paradigms do not have infinitely many members, but a hierarchical ordering of paradigms is commonly in evidence. Typically, for instance, in languages with grammatical cases, the case paradigm is subordinated to a number paradigm; see Table 1.

This relation of subordination, which can be summed up as CASE] NUMBER], becomes manifest in historical change when CASE is lost while NUMBER remains, as in many European languages.

Table 1: Latin First declension

	Singular	Plural
NOM	<i>tabul-a</i>	<i>tabul-a-e</i>
ACC	<i>tabul-a-m</i>	<i>tabul-ā-s</i>
GEN	<i>tabul-a-e</i>	<i>tabul-ā-r-um</i>
DAT	<i>tabul-a-e</i>	<i>tabul-ī-s</i>
ABL	<i>tabul-ā</i>	<i>tabul-ī-s</i>

(2) PERSON] NUMBER] TENSE] ASPECT] MOOD] VOICE]

Similarly in verbs, the category of PERSON is often subordinated to that of NUMBER. In Latin this relationship is realized in each of the three tenses Present, Imperfect, Future, in both aspects, Inflective and Perfective (where the tenses are called Perfect, Pluperfect, and Future Perfect), in both moods, Indicative and Subjunctive, and in both voices, Active and Passive, yielding a structure that is easily represented by a tree-diagram, but can be summed up as in (2).

1.2 Exponent paradigms

When we turn to the expression side of languages, we find paradigms of less consistently hierarchical structure. A language may have extensive allomorphy in its inflectional categories; see, for example the Latin case allomorphy in Table 2.

Table 2: Allomorphy in Latin noun declension. Singular

NOM.SG	-a/-e/-es/-ēs/-is/-s/-ū/-um/-us/-Ø
ACC.SG	-am/-e/-em/-im/-ū/-um/-us/-Ø
GEN.SG	-ae/-eī/-ī/-is/-ūs
DAT.SG	-ae/-eī/-ī/-u/-uī
ABL.SG	-ā/-e/-ē/-i/-ō/-ū

The allomorphs are organized into several partly overlapping classes, the “declensions”. The grammatical tradition recognizes five declensions (Table 3), that is, a paradigm of five noun classes forming a flat structure. But several of the declensions have cases with notable internal allomorphy, that is, allomorph paradigms within case paradigms within the paradigm of declensions; see Table 3.

Table 3: Allomorphy in Latin case desinences

	Decl. 1	Decl. 2	Decl. 3	Decl. 4	Decl. 5
NOM.SG	-a	-um/-us/-Ø	-e/-es/-is/-s/-Ø	-ū/-us	-ēs
ACC.SG	-am	-um/-us	-e/-em/-im/-Ø	-ū/-um	-em
GEN.SG	-ae	-ī	-is	-ūs	-eī
DAT.SG	-ae	-ō	-ī	-u/-uī	-eī
ABL.SG	-ā	-ō	-e/-i	-ū	-ē

In Decl. 2, for instance, feminines and masculines have syncretic desinences in all cases; e.g., *fīcus*.F.NOM.SG, *fīcum*.F.ACC.SG, *fīcī*.F.GEN.SG ‘fig’, *servus*.M.NOM.SG, *servum*.M.ACC.SG, *servī*.M.GEN.SG ‘slave’. Both masculines and neuters have additional, lexically conditioned allomorphs: Some Decl. 2 masculines have a -Ø NOM.SG desinence (*vir* ‘man’, *liber* ‘book’), and a few Decl. 2 neuters have -us.NOM/ACC.SG (*vulgus* ‘crowd’, *vīrus* ‘poison’). This allomorphy is conditioned by the gender of lexical stems; hence each of the endings -um.NOM.SG and -us.ACC.SG points to (or indicates) the neuter gender of its noun stem; see Table 4.

Table 4: Allomorphy paradigms in Latin Second-declension desinences

NOM.SG			ACC.SG		
M	F	N	M	F	N
-us/-Ø	-us	-um/-us	-um	-um	-um/-us

Table 5: Allomorphy paradigms in Russian First-declension desinences

NOM.SG		ACC.SG		GEN.SG		LOC.SG	
M	N	M	N	M	N	M	N
-Ø	-o	-Ø/-a	-o	-a/-u	-a	-e/-u	-e

A similar case paradigm in Russian (Table 5) includes paradigms of allomorphs that indicate the gender of the stems: NOM.SG -o (*okn-o* ‘window’) indicates neuter, NOM.SG -Ø (*gorod-Ø* ‘town’) indicates masculine. But additional allomorphs within the masculine point to referential features such as animacy

(ACC.SG *syn-a* ‘son’ vs *gorod-Ø*) or mass vs countable (GEN.SG *čaj-u* ‘tea’ vs *gorod-a*) or material vs nonmaterial referent (LOC.SG *v sneg-ú* ‘in the snow’ vs *v sneg-e* ‘in snow (as concept or word)’).

In terms of the theory of semiotics of Charles S. Peirce, the semiotic value of this low level allomorphy is identified as indexical (Shapiro 1969; Anttila 1972, 1989; Andersen 1980, 2020): individual allomorphs point to, indicate, or are indexes of phonological, grammatical, or lexical features of given noun stems or features of their referents or combinations of such subsidiary information.

A systematic investigation of the contribution of this secondary level of signaling in communication is a task for the future. But the index values of allomorphs or morphological processes such as mutation or truncation will be relevant repeatedly below.

2 Typological paradigms

Here we turn to yet another paradigmatic relation in inflection, one that opens up a neglected perspective on morphological systems.

For the purposes of this exposition it is useful to be able to refer to Sapir’s (1921: 120–146) typology of morphological techniques. It is presented in Table 6 with minimal characterizations of the individual types, derived from Sapir’s text; I use *introflection* for Sapir’s *symbolism*.

Table 6: Basic morphological techniques

A.	Analytic	Constructions of lexical and grammatical words, free or clitic.
B.	Synthetic	
	Agglutination	Simple juxtaposition of bound lexical and grammatical morphemes. ± Cross-boundary phonological or phonotactic indexing.
	Fusion	Grammatical morphemes with cumulative grammatical content. ± Cross-boundary grammatical and/or lexical content indexing.
	Introflection	Lexical morphemes with grammatical content.
C.	Isolating	Grammatical exponents not constructed with lexical morphemes.

The major types (A, B, C) form a paradigm, and within the synthetic macro-type, agglutination, fusion, and introflexion form another paradigm. In the following pages we will see some examples of how these paradigms are exploited in morphological systems. The examples are taken from English (Section 2.1), French (Section 2.2), Latin (Section 2.3), and Russian (Section 2.4).

2.1 English conjugation

It is convenient to begin with the conjugation of the English verb; see the major verbal categories in Table 7. Infinitive and imperative are uninflected. They have identical lexical content; their distinct grammatical content is expressed solely by their syntactic properties. In the Present Indicative, the 3SG is suffixed /-əz/ (|| /ɪz/) after sibilants, /-s/ after voiceless stops, and otherwise /-z/, e.g., *pitch-es*, *bat-s*, *jog-s*, *run-s*. The content of this desinence is debatable; some would consider it cumulative ('3SG Present Indicative'), but it might be just 'Indicative', specifying a predicate as asserted, in the least marked Person–Number–Tense environment. Assuming that cumulative exponence is characteristic of fusion (cf. Table 6), this noncumulative interpretation would be compatible with agglutination, as are the phonotactic adjustment after sibilant stems and the phonological adjustment after voiceless stops. The Present participle in /-ɪŋ/ is agglutinative.

Table 7: English verb morphology: Categories

Present system	Preterite system
Infinitive	
Imperative	
Present tense	Preterite
Present participle	Past participle
Auxiliated: Progressive and Futures	Auxiliated: Perfect and Passives

The Past tense and Past participle are expressed by three formations that differ in morphological technique. They form a selectional set, a paradigm; data from Bloch (1947), Palmer (1987: 249–257).

Preterite 1, the productive pattern characteristic of thousands of verbs and applied to all new verbs, is agglutinative. It has a phonotactic adjustment /-əd/ (|| /ɪd/) after stem-final dental plosives (here written ...T), a voiceless allomorph /-t/ after stem-final voiceless consonants, and otherwise /-d/; see Table 8.

Preterite 2 is fusional. It comprises verbs with the regular /-t/ and /-d/ allomorphs and some that have a lexically conditioned /-t/. Some of these verbs have

a vowel mutation in the Preterite (*keep–kept*, *flee–fled*, *mean–meant*), some have both a vowel and a coda mutation (*lose–lost*), some have a vowel mutation and coda truncation (*can–could*, *catch–caught*); a couple have just coda truncation (*make–made*); see Table 9.

Table 8: English Preterite 1: Agglutinative

...T__	...vI C__	Default
<i>bat</i> : -əd (-ed)	<i>pitch</i> : -t (-ed)	<i>wail</i> : -d (-ed)
<i>bat</i> - <i>batted</i>	<i>pitch</i> - <i>pitched</i>	<i>wail</i> - <i>waited</i>
<i>wade</i> - <i>waded</i>	<i>miss</i> - <i>missed</i>	<i>jog</i> - <i>jogged</i>

Table 9: English Preterite 2: Fusional

Regular -t	Regular -d	Irregular -t
Vowel mutation		
<i>keep</i> , <i>leap</i> , <i>sleep</i> , <i>weep</i> ,	<i>flee</i> , <i>say</i> , <i>hear</i> , <i>tell</i> , <i>sell</i> ,	<i>dream</i> , <i>mean</i> , <i>feel</i> , <i>kneel</i> ,
...
Vowel mutation and	Vowel mutation and coda truncation	
coda mutation		
<i>cleave</i> , <i>leave</i> , <i>lose</i> ,...	<i>can</i> , <i>shall</i> , <i>will</i>	<i>catch</i> , <i>teach</i> , <i>bring</i> , ...
	Coda truncation	
	<i>have</i> , <i>make</i>	

The mutations in the stems of these verbs are conditioned by the Past-tense category. Since Past tense is separately expressed by the distinct Past tense marker in all these verbs, the mutations are indexical, and the morphological type of these forms is fusional; cf. Table 6. Some of these verbs have an agglutinative Preterite 1 variant in which the mutation is omitted, e.g., *leaped*, *dreamed*, *kneeled*, *cleaved*. There are also basically agglutinative verbs with a variant ‘Irregular -t’ Preterite 2 and no mutation, e.g. *spell–spelt*, *spill–spilt*.

There are no verbs in Preterite 2 that have the phonotactic vowel epenthesis (-əd) found in Preterite 1. Instead, Preterite 2 verbs in stem-final dental plosive (here written ...T) truncate the ...t or ...d after the appropriate Preterite allomorph has been selected, that is, ...t-t → -t, ...d-d → -d, ...d-t → -t; see Table 10. Some English experts view the ending in these verbs as -∅ (Palmer 1987). The verbs with regular -t or -d might be described that way; but the verbs with ‘Irregular -t’ suggest that it is indeed the stem-final dental plosive that is truncated.

Table 10: English Preterite 2': Fusional

Regular -t ...T truncation	Regular -d	Irregular -t
<i>slit, split, put, bet, let, cut, hurt, cost, must, burst, ...</i>	<i>bid, rid, shed, spread, ...</i>	<i>bend, rend, send, build, ...</i>
Vowel mutation and ...T truncation		
<i>meet</i>	<i>bleed, lead, read, slide,...</i>	

Preterite 3 comprises verbs with unsuffixed and with suffixed PST.PTCP. Besides this distinction there are verbs with three alternating vowels (*sing-sang-sung, drive-drove-driv-en*), with two vowels, identical in PRS and PST.PTCP (*run-ran-run, know-knew-know-n*) or identical in PST and PST.PTCP (*hang-hung-hung, speak-spoke-spok-en*), and with a single vowel throughout (*beat-beat-beat-en*); see Table 11.

Preterite 3 is typologically diverse. In the unsuffixed lexemes past tense and past-participle function are expressed through introflexion (cells 1.1–1.3). In the suffixed lexemes, past tense is expressed through introflexion (cells 2.1–2.4), and past-participle functions by the suffix alone (cells 2.2, 2.4; agglutination) or by the suffix accompanied by stem-vowel mutation (cells 2.1, 2.3); this is fusion.

Casual speaking styles show a strong tendency to extend the introflective past-tense forms to past-participle function, e.g. *I would've did it differently* (cell 2.1), *you could've came earlier* (cell 1.2), *they should've took the other one* (cell 2.2).

The different formations of the English Preterite form a typological paradigm as in Table 12. As a selectional set they are evidenced in synchronic (stylistic, social) variation. Preterite 1 ~ Preterite 2: *dreamed ~ dreamt, kneeled ~ knelt*; Preterite 1 ~ Preterite 3: *strived ~ strove, thrived ~ throve*, (metaphorical) *weaved* (through traffic) ~ *wove, slayed* (an audience) ~ *slew*; Preterite 2' ~ Preterite 3: *(for)bid ~ (for)bade*; note Preterite 1 ~ 2 ~ 3 in *cleave-cleaved ~ cleave-cleft ~ cleave-clove-cloven*; all variants cited from *The American Heritage Dictionary*.

Table 12 displays the paradigm of morphological techniques of English conjugation.¹

¹English noun plurals exemplify the same variation. Analytic: *heads of cattle, ... cabbage; pairs of scissors, ... trousers, cloves of garlic*. Agglutination: *horse-s, cat-s, dog-s, cow-s, ox-en*. Fusion: *calf-calv-es, house-hous-es, youth-youth-s; child-childr-en*. Introflexion: *woman-women, man-men; foot-feet*, also *tooth, goose; mouse-mice*, also *louse*; *crisis-crises, alumna-alumnae; sheep-sheep*, also *deer, grouse, trout, fish; sail, cannon*.

Table 11: English Preterite 3

1. No past-participle suffix	2. Suffixed participle
1.1 Three alternating vowels	2.1 Three alternating vowels
<i>sing</i> (+ 9 more)	<i>drive</i> (+ 8 more), <i>fly</i> , <i>do</i>
1.2 Distinct vowel in Pst	2.2 Distinct vowel in Pst
<i>come</i> , <i>run</i>	<i>know</i> (+ 4), <i>take</i> (+ 1), <i>slay</i> , <i>eat</i> , <i>give</i> , <i>see</i> , <i>bid</i> , <i>fall</i> , <i>draw</i>
1.3 Distinct vowel in Pst and PST.PTCP	2.3 Distinct vowel in Pst and PST.PTCP
<i>cling</i> (+ 10), <i>hang</i> , <i>strike</i> , <i>sneak</i> , <i>shine</i> , <i>bind</i> (+ 3), <i>hold</i> , <i>sit</i> (+2), <i>shoot</i> , <i>fight</i> , <i>light</i>	<i>speak</i> (+ 5), <i>break</i> (+ 1), <i>choose</i> , <i>lie</i> , <i>get</i> (+ 4), <i>bite</i> (+ 4)
	2.4 One vowel in all three stems
	<i>beat</i>

Table 12: English conjugation in typological perspective

Analytic	Futures (<i>will</i> , <i>is going to work</i>), Continuous (<i>is</i> , <i>was</i> , <i>has been working</i>), Retrospective (<i>has</i> , <i>had worked</i>), Passive (<i>was</i> , <i>got fired</i>)
Agglutination	Present: 3sg Indicative; Prs.ptcp; Preterite 1. Preterite 3: suffixed PST.PTCP (types <i>known</i> , <i>beaten</i>)
Fusion	Preterite 2. Preterite 3: suffixed PST.PTCP (types <i>driven</i> , <i>spoken</i>) Modal verbs, <i>have</i> (<i>has</i> , <i>had</i>), <i>been</i>
Introflexion	Preterite 3: Pst, unsuffixed PST.PTCP <i>be</i> (<i>am</i> , <i>is</i> , <i>are</i> , <i>was</i> , <i>were</i>)

Here it is worth noting that the vowel alternations in Preterite 3 verbs reflect those of the Indo-European Present vs. Perfect formations. These apophonic alternations, which Germanic shares with all the other Indo-European languages, may be at least 7000 years old. The agglutinative Preterite 1, by contrast, is Common Germanic heritage, perhaps less than 2500 years old. With the exception of the ‘be’ passive, the analytic, auxiliated formations are much younger.

It appears that this typological perspective reflects what one can call the historicity of the system of verbal morphology.

Now, we know enough of the history of English to recognize that this is not the same as reflecting the history of the language. A historical account will acknowledge (i) that Preterite 2 developed from Preterite 1 thanks to a variety of conditioned sound changes, so it is younger; (ii) that in Old English our apophonic Preterite 3 verbs had a separate set of past-tense desinences, that is, they were fusional; they became introflective only when this ‘strong’ past-tense inflection was lost; but also (iii) that more Preterite 3 verbs have changed to Preterite 1 or 2 since Old English, than vice versa, and (iv) that there is a similar predominance of Preterite 2 verbs transitioning to Preterite 1.

None of these details can be read off the overview in Table 12. Still the typological paradigm undeniably suggests a generalized historical perspective on this synchronic system.

In the following pages I will look at a few other languages whose history is known, to see to what extent such a historical perspective may be a common feature of morphological systems.

2.2 French conjugation

French has two regular conjugations, one productive, exemplified by *chanter* ‘sing’, the other practically unproductive, typified by *finir* ‘finish’. In addition there is a number of irregular verbs. The system of categories can be seen in Table 13.

An important feature of French conjugation is that finite verbs are obligatorily accompanied by subject clitics; consequently the (contingent) suffixal Participant (Person, Number) marking is strictly an agreement feature.

Conj. 1 is agglutinative: Suffixes for tense, mood, person, and the nonfinite categories simply follow the stem. There is some stem allomorphy: Some verb stems with mid vowels have a regular alternation between pretonic and tonic (final, closed) syllable: /e/, /ə/ ~ /ɛ/ (*céder*–*cède* ‘cede’, *jeter*–*jette* ‘throw’, *appeler*–*appelle* ‘name, call’), /ø/ ~ /œ/ (*beurrer*–*beurre* ‘butter’), and /o/ ~ /ɔ/ (*coller*–*colle*

Table 13: French tense system

Present system	Preterite system	Infinitive system
Present indicative	Past indicative	Future
Present subjunctive	Past subjunctive	Conditional
Imperfect		
Present participle	Past participle	Infinitive

‘glue’). The alternation has no apparent synchronic motivation; contrast *aider-aide* ‘help’ with /ε/, *sauver-sauve* ‘save’ with /o/; but it is phonologically (prosodically) conditioned, and it is irrelevant to the stem–desinence boundary. Thus it is compatible with agglutination.

Conj. 2 is similarly agglutinative. But it is characterized by two truncations that produce distinct stems for (i) PRS.IND.123SG and (ii) the Preterite and Infinitive systems; see (3.a–b), where superscript 0, 00 represent coda and rhyme truncation, respectively; the basic stem ends in /s/, e.g., /finis-/. The truncations produce stem allomorphs with specific grammatical meaning: This is a fusional feature.

- (3) a. PRS.IND: fin⁰-Ø.123SG vs finis-ø.1PL, finis-Ø.3
 textscpl; PRS.SBJ: finis-Ø.123SG.3PL, finis-j-ø.1PL; IMPF:
 finis-ε.123SG.3PL; PRS.PTCP: finis-ã
- b. ST.IND: fin⁰⁰-i-Ø.123.SG, fin⁰⁰-i-m.1PL, fin⁰⁰-i-t.2PL, fin⁰⁰-i-r.3PL;
 PST.SBJ: fin⁰⁰-i-s-Ø.12SG.3PL, fin⁰⁰-i-s-j-ø.1PL, fin⁰⁰-i-PST.PTCP,
 fin⁰⁰-ir-INF

The contrast between the stem-final ...s- in finis-Ø.PRS.SBJ.123SG.3PL (*finisse(nt)*) (3) and the PST.SBJ morpheme -s- in fin⁰⁰-i-s-Ø.PST.SBJ.12SG.3PL (*finisse(nt)*) (3b) is recognized by French grammarians (see Grevisse 1961: 588–589). These grammatical forms are systematically homophonous in Conj. 2 verbs, but since they have different morpheme constituency they are not homonymous.

Irregular verbs have largely the same agglutinative suffixations as Conj. 1 and 2 verbs; but they have different allomorphs in the Preterite and Future systems; and they are characterized by stem mutations and truncations, as well as by stem suppletion. The lexical distribution of these features is irregular. A systematic presentation of the whole picture would exceed the space available here. The

following subregularities and a few illustrations in (4) will suffice for the present purpose.

- (4) a. Vowel mutations, homologous to those in Conj. 1, but involving different vowels. /e/ → /jɛ/, /ə/ → /wa/, /y/ → /wa/, /u/ → /ø ~ œ/; phonotactically, /jɛ/ and /wa/ count as single segments. In some verbs the vowel mutation affects PRS.IND.123SG.3PL; e.g., *acquérir* ‘get’: *aker-ō.1PL*, *akjer-Ø.3SG*, *akjer-Ø.3PL* (*acquérons*, *acquiert*, *acquièrent*), *mourir* ‘die’: *mur-ō*, *mœr-Ø*, *mœr-Ø* (*mourons*, *meurt*, *meurent*).
- b. Coda truncation in PRS.IND.SG; e.g., *dormir* ‘sleep’: *dœrm-ō.1PL*, *dœrm-Ø.3PL*, but *dœr⁰-Ø.3SG* (*dormons*, *dorment*, *dort*); *bouillir* ‘boil’: *buj-ō*, *buj-Ø*, *bu⁰-Ø* (*bouillons*, *bouillent*, *bout*); *lire* ‘read’: *liz-ō*, *liz-Ø*, *li⁰-Ø* (*lisons*, *lisent*, *lit*).
- c. Coda truncation in PRS.IND.SG also occurs in some verbs with vowel mutation (but not in PRS.SBJ.1–3SG): *recevoir* ‘receive’: *rəsəv-ō.1PL*, *rəswav-Ø.3PL*, *rəswa⁰-Ø.3SG* (*recevons*, *reçoivent*, *reçoit*); *devoir* ‘ought; owe’: *dəv-ō*, *dwav-Ø*, *dwa⁰-Ø* (*devons*, *doivent*, *doit*); *boire* ‘drink’: *byv-ō*, *bwav-Ø*, *bwa⁰-Ø* (*buvons*, *boivent*, *boit*); *mouvoir* ‘move’: *muv-ō*, *mœv-Ø*, *mø⁰-Ø* (*mouvons*, *meuvent*, *meut*).
- d. Rhyme truncation in PST.IND.SBJ, as in Conj. 2; e.g., *acquérir*: *aker-ō.1PL*, *ak⁰⁰-i-Ø.3SG* (*acquérons*, *acqui*); *voir* ‘see’: *vwaj-ō*, *v⁰⁰-i-Ø* (*voyons*, *vi*); *recevoir*: *rəsəv-ō*, *rəs⁰⁰-y-Ø* (*recevons*, *reçu*); *devoir*: *dəv-ō*, *d⁰⁰-y-1Ø1* (*devons*, *du*); *boire*: *byv-ō*, *b⁰⁰-y-Ø* (*buvons*, *bu*); *lire*: *liz-ō*, *l⁰⁰-y-Ø* (*lisons*, *lu*); *savoir* ‘know’: *sav-ō*, *s⁰⁰-y-Ø* (*savons*, *su*).
- e. Preterite allomorphy. -i- ~ -y-; e.g., (i) -i- in both PST.IND.SBJ and PST.PTCP: e.g., *dormir*: *dœrm-i-Ø*, *dœrm-i* (*dormi*, *dormi*); *bouillir*: *buj-i-Ø*, *buj-i* (*bouilli*, *bouilli*); (ii) -i- in PST.IND-SBJ, -y- in PST.PTCP: *voir*: *v⁰⁰-i-Ø* and *v⁰⁰-y* (*vi*, *vu*), *rompre* ‘break’: *röp-i-Ø*, *röp-y* (*rompi*, *rompu*), *battre* ‘beat’: *bat-i-Ø*, *bat-y* (*batti*, *battu*). (iii) -y- in both PST.IND-SBJ and PST.PTCP: *lire*: *l⁰⁰-y-Ø* and *l⁰⁰-y* (*lu*, *lu*), *courir* ‘run’: *kur-y-Ø* and *kur-y* (*couru*, *couru*).
- f. Interfixed consonants in INF and/or FUT.COND; e.g., *connaître* ‘know’: *kœnɛs-ō*, *kœnɛ⁰-t-r-INF* (*connaissons*); *coudre* ‘sew’: *kuz-ō*, *ku⁰-d-r* (*cousons*); *moudre* ‘grind’: *mul-ō*, *mu⁰-d-r* (*moulons*); *tenir* ‘hold’: *tæn-ō*, *tjē-d-r-ε.cond.3SG* (*tenons*, *tiendrait*); *vouloir* ‘will, want’: *vul-ō*, *vu⁰-d-r-ε* (*voulons*, *voudrait*).

The features in (4a–4f) are relevant to many irregular verbs. They define some stem allomorphy indicating desinential grammatical content and some desinence allomorphy indicating the lexical content of the stem: This is fusion.

The following examples in (5) illustrate wordforms that combine lexical and grammatical content: Introflexion.

- (5) a. A specific stem for PRS.SBJ: *aller* ‘go’: al- \tilde{o} .PRS.IND.1PL but aj- \emptyset .PRS.SBJ.123SG.3PL (*allons, aille(nt)*); *vouloir*: vul- \tilde{o} , v \emptyset l.PRS.IND.3PL but v \emptyset j- \emptyset (*voulons, veulent, veuille(nt)*); *savoir*: sav- \tilde{o} , sav- \emptyset but saš- \emptyset (*savons, savent, sache(nt)*).
- b. A specific stem for FUT and COND. *tenir*: t \emptyset n- \tilde{o} , t \tilde{j} \tilde{e} -d-r-e.FUT.1SG (*tenons, tiendrai*), *aller*: al- \tilde{o} , ir-e (*allons, irai*), *voir*: vwaj- \tilde{o} , v \tilde{e} r-e (*voyons, verrai*).
- c. A specific wordform for PST.PTCP (feminine endings in parentheses). *Offrir* ‘offer’: α fr- \tilde{o} , α fer(-t) (*offrons, offert*); *ouvrir* ‘open’: uvr- \tilde{o} , u \tilde{v} er(-t) (*ouvrons, ouvert*); *mourir*: mur- \tilde{o} , m α r(-t) (*mourons, mort*); combined with rhyme truncation: *acquérir*: aker- \tilde{o} , ak⁰⁰-i(-z) (*acquérons, acquis*); *mettre* ‘put’: m \tilde{e} t- \tilde{o} , m⁰⁰-i(-z) (*mettons, mis*); *écrire* ‘write’: ekriv- \tilde{o} , ekr⁰⁰-i(-t) (*écrivons, écrit*).
- d. Other grammatically specific stems or wordforms. (i) *haïr* ‘hate’: ais- \tilde{o} , ϵ .PRS.123SG (*haïssons, hait*); (ii) *pouvoir* ‘can, be able’: p \tilde{u} i.PRS.IND.1SG, p \tilde{u} is-.PRS.SBJ (*puis, puisse(nt)*); (iii) *savoir*: sav-.PRS.IND.PL/INF, se.PRS.IND.SG, saš-.PRS.SBJ/PTCP, s⁰⁰-.PST.IND/SBJ/PTCP, so-r-.FUT/COND (*savons, savais, sais, sache(nt), sachant, sus, saurai*); (iv) *aller*: v ϵ .PRS.IND.1SG, va.23SG, v \tilde{o} .3PL, aj-.PRS.SBJ, ir-.FUT/COND (*vais, va, allons, vont, aille, ir-ai*); (v) *avoir* ‘have’: e.PRS.IND.1SG, a.23SG, \tilde{o} .3PL, ϵ .PRS.SBJ.123SG.3PL, y-.PST/PST.PTCP, or-.FUT/COND (*avons, ai, a, ont, aie, eus, aurai*); (vi) *être* ‘be’: s \tilde{u} i.PRS.IND.1SG, ϵ .23SG, som.1PL, ϵ t.2PL, s \tilde{o} .3PL, swa-.PRS.SBJ, fy-.PST, ϵ t-.INF, s α r-.FUT/COND, ϵ te.PST.PTCP (*suis, est, sommes, sont, sois, fus, êt-re, se-r-ai, été*); (vii) *faire* ‘do, make’: f α z-.PRS.IND.1PL/PTCP/IMPF, f ϵ .PRS.123SG/INF, f ϵ t.PRS.IND.2PL, f \tilde{o} .3PL fas-.PRS.SBJ, fl.PST, f α r-.FUT/COND, f ϵ (-t).PST.PTCP (*faisons, fait, faites, font, fasse(nt), fi, ferai, fait*).

The irregular lexical distribution of the many subregularities in the morphology of these verbs makes for some complexity; in Stump & Finkel’s (2017) approach, French has 72 conjugations. Still, it is clear that features in (4a–4f) produce allomorphy, in stems or suffixes, that amounts to cross-boundary indexes;

they exemplify the technique of fusion. The examples in (5) are stems or word-forms that combine lexical and grammatical content; this is introflection. Many irregular verbs have no introflective forms at all, but several have a handful or more.

Table 14: French conjugation in typological perspective

Analytic	Obligatory pronominal subject clitics. Passive: <i>être</i> + P.P.P.; Perfect: <i>avoir/être</i> + P.P.P.; Auxiliated Future: <i>aller</i> + INF; Causative: <i>faire</i> + INF.
Agglutination	Only productive type: <i>chanter</i> ; regular, prosodically conditioned stem-internal V-mutations (type <i>céder-cède</i>).
Fusion	Stem allomorphy. V-mutations, coda truncation, rhyme truncation, V/C-interfixation: <i>finir</i> : finis fini ⁰ fin ⁰⁰ -i-; <i>mouvoir</i> : muv mœv mœ ⁰ m ⁰⁰ -y-; <i>recevoir</i> : rəsəv rəsɔv rəsɔv ⁰ rəsɔv ⁰⁰ -y-; <i>devoir</i> : dəv dɔv dɔv ⁰ d ⁰⁰ -y-; <i>lire</i> : liz li ⁰ li ⁰⁰ -y-; <i>écrire</i> : ekriɐv ekri ⁰ ekri ⁰⁰ -i-. Lexically conditioned suffix allomorphy: PST -e/a/ε-, -i-, -y-, P.P.P. -e-, -i-, -y-; INF -e, -r, -ir, -war.
Introflection	<i>hair</i> : ε.PRS.SG; <i>pouvoir</i> : pui puiɐ; <i>vouloir</i> : vœj; <i>savoir</i> : se saʃ-s- sor-; <i>aller</i> : vε va vœ aj- ir-; <i>faire</i> : fəz- fε- fet fœ fas- f-fε(-t) fər-; <i>avoir</i> : e a œ aj- y- or-; <i>être</i> : sɥi ε som et sœ swa-f- ete sər-; lexicalized PST.PTCP: <i>mār(-t)</i> , <i>ɔfer(-t)</i> , <i>mi(-z)</i> , <i>ekri(-t)</i> , <i>aki(-z)</i>

In Table 14, only the Passive is old; the other analytic formations have developed since the early Middle Ages. The productive, agglutinative pattern is the descendant of the Latin productive Conj. 1. Among the fusional verbs only the regular but unproductive *finir* conjugation continues a productive Latin formation (Late Lat. *finīscō-finīvī-finīre*). The other fusional patterns as well as all the introflective ones go back to pre-Latin formations that had ceased to be productive in classical Latin; this is true also of some post-Latin suppletive verbs, e.g., Fr. *aller* (< *ambulāre*, *vadere*, *īre*) and *être* (< *esse(re)*, *stare*).

The analytic formations are of different age. But the synthetic part of the paradigm largely reflects the historicity of the system.

2.3 Latin conjugation

The hierarchy of Latin verbal categories was briefly summarized in (2), repeated here as (6).

(6) PERSON] NUMBER] TENSE] ASPECT] MOOD] VOICE]

In Latin, verbal inflection is organized in a paradigm of four conjugation classes, traditionally numbered 1 to 4. Conj. 1 is fully productive, Conj. 4 less so; Conj. 2 and 3 are unproductive, the latter, with the exception of inchoative verbs formed with the suffix *-sc-* (*senēscō* ‘age’, Late Lat. *finīscō* ‘finish’).

Basic-stem formation. Verb stems are derived from lexical morphemes with interfixes (stem formatives), in Conj. 1 with *-ā-*, in Conj. 4 with *-ī-*, in Conj. 2 with *-ē-* (~ *-Ø-* ~ *-i-*; see below). In Conj. 3, some basic (Inflective) stems are derived with several lexically conditioned affixes, other stems are bare, e.g., interfixed (*cap-i-ō* ‘catch’), infixed (*ru-m-p-ō* ‘break’), and bare stem (*ag-ō* ‘lead’). The interfixation, being lexically conditioned, is fusional derivation. Verb stems serve as bases for inflection for Voice, Mood, Aspect, Tense, Number and Person as well as the derivation of a roster of deverbal nominal (Infinitive, Gerund), adjectival (Gerundive, Present and Past Participle), and adverbial (Supines 1 and 2) derivatives, as well as deverbal verbs (e.g., frequentative, desiderative). Here we focus on the obligatory verbal categories.

Voice: In the Passive, the Perfective tenses are analytic (auxiliary ‘be’ + P.P.P.); in the Inflective tenses, Passive morphs are joined with Participant (Person/Number) exponents (see below) (7g).

Mood: In the Subjunctive there is no distinct Future or Future perfect; but Subjunctive is expressed cumulatively with the other tenses (see below). In the Imperative there is no Perfective aspect, no Imperfect tense, only second person forms; the Future is expressed by the suffix *-to-*. Negative Imperative is auxiliated, *noli* ‘do not’ + INF.

Aspect: In Conj. 1, 2, 4 Inflective stems are identical with the INF stem. In Conj. 1 and 4, the Perfective exponent is *-v-*, in Conj. 2, where the class suffix is *-Ø-* in the Perfective, the suffix is *-u-*: the *-v-* ~ *-u-* alternation is phonologically conditioned: it is agglutinative (7).

In Conj. 3 Perfective stems are related to Inflective stems by (i) deaffixation (*cap-i-ō-cēp-ī*, *ru-m-p-ō-rūp-ī*), (ii) vowel mutation and/or (iii) quantity change (*ag-ō-ēg-ī*), (iv) reduplication (*curr-ō-cu-curr-ī* ‘run’), (v) a combination of some

of these (*ta-n-g-ō-te-tig-ī* ‘touch’), (vi) affixation (*scrib-ō-scrip-s-ī* ‘write’, *ping-ō-pinx-ī* ‘paint’), or (vii) invariant-stem inflection (*scand-ō-scand-ī* ‘ascend’). Types (i–v) are fusional: the stem allomorph points to the Perfect desinences; (vi) and (vii) are agglutinative, (vi) with an overt *-s-*, (vii) with zero Perfect suffix.

- (7) a. Present. Conj. 1 *amā-re*.INF., *amā-v-ī*.PRS.PFV.1.SG; Conj. 2 *monē-re*, *mon-u-ī*; Conj. 3 *capi-ō*, *cēp-ī*; *ag-ō*, *ēg-ī*; Conj. 4 *audī-re*, *audī-v-ī*.
 b. Past. Conj. 1 *amā-b-a-m*.PST.INFV, *amā-v-er-a-m*.PST.PFV; Conj. 2 *monē-b-a-m*, *mon-u-er-a-m*; Conj. 3 *capi-ē-b-a-m*, *cēp-er-a-m*; *ag-ē-b-a-m*, *ēg-er-a-m*; Conj. 4 *audi-ē-b-a-m*, *audī-v-er-a-m*.
 c. Future. Conj. 1, 2 *amā-b-ō*.FUT.INF, *amā-v-er-ō*.FUT.PFV; *monē-b-ō*, *mon-u-er-ō*; vs. Conj. 3, 4 *capi-a-m*, ...-e-s, ...-e-nt, *cēp-er-ō*; *ag-a-m*, *ēg-er-ō*; *audi-a-m*, *audī-v-er-ō*.
 d. Prs.subj *am⁰-e-m*, *mone-a-m*, *capi-a-m*, *audi-a-m*; IMPF.SUBJ *amā-r-e-m*, *monē-r-e-m*, *cap-er-e-m*, *audī-r-e-m*; PRF.SUBJ *amā-v-er-i-m*, *mon-u-er-i-m*, *cēp-er-i-m*, *audī-v-er-i-m*; PLUP.SUBJ *amā-v-iss-e-m*, *mon-u-iss-e-m*, *cēp-iss-e-m*, *audī-v-iss-e-m*.
 e. Conj. 1: *amā-re*.INF. but *am⁰-ō*.PRS.IND.1SG, *am⁰-em*.PRS.SBJ.1.SG.
 f. Prs *amā-s*.2SG, *ama-t*.3SG, *amā-mus*.1PL, *amā-tis*.2PL, *ama-nt*.3PL.
 g. Conj. 1: *amā-re*.INF, *amā-v-ī*.PRF.1.SG, *amā-t-us*.PST.PASS.PTCP; Conj. 2: *monē-re*, *mon-u-ī*, *moni-t-us*; Conj. 3 *cap-e-re*, *cēp-ī*, *cap-t-us*; Conj. 4: *finī-re*, *finī-v-ī*, *finī-t-us*.
 h. *am⁰-o-r*, *amā-r-is*, *amā-t-ur*, *amā-m-ur*, *amā-mini*, *ama-nt-ur*.

Tense: Indicative: In both aspects, Present tense has a zero exponent. Past Inflective (Imperfect) and Perfective (Pluperfect) are expressed by *-b-ā-* and *-er-ā-*, respectively; in Conj. 3, 4 the Inflective *-b-* is affixed to an *-ē-* interfix (7b). Future Inflective (Future) in Conj. 1, 2 is expressed by *-b-ō/i/u-* and Future Perfective (Future Perfect) of all verbs, by *-er-ō/i/u-*. In Conj. 3, 4 Future Inflective is expressed by *-a/e-* (7c). The structure of all these forms is transparent and mainly agglutinative. The *-b- ~ -er-* allomorphs (‘nonPresent’) indicate Aspect; the allomorphy is fusional. The *-b-* vs *-a/e-* allomorphy in the Inflective Future indicates Conj. class; in Conj. 3, 4 the *-a- ~ -e-* allomorphy indicates Person (*-a-m*, *-e-s*, ...): both these alternations are fusional.

In the Subjunctive, Present is expressed by *⁰-e-* in Conj. 1, otherwise by *-a-*; Imperfect is expressed by *-r-e-* in Conj. 1, 2, 4 and by *-er-e-* in Conj. 3: phonological

conditioning. Perfect is *-er-i-* and Pluperfect, *-iss-e-* (7d). In sum, Tense is largely expressed agglutinatively, but indicates Mood and Aspect: Fusion. Person and Number allomorphy is conditioned by Voice, Aspect and Tense (7e).

In the Active Participant desinences, separate plural exponents can be recognized in the final *-s* of *-mu-s.1PL*, *-ti-s.2PL*, and in the longer desinence *-nt.3PL* vs *-t.3SG* (7f). Passive suffixes are partly fused with Participant desinences: *-o-r.1SG.PASS*, *-r-is.PASS.2SG*, *-t-ur.3SG.PASS*, and *-nt-ur.3PL.PASS* are agglutinative; in *-m-ur.1PL.PASS*, Person and Number are cumulative; in *-mini.PASS.2PL*, similarly, Voice, Person, and Number are cumulative (7g): Fusion.

In the Perfective Present (the Perfect), *-ī.1SG* is a covariant of the Inflective Present and Future *-ō.1SG* and the default *-m.1SG*. The desinences *-is-tī.2SG* and *-is-ti-s.2PL* contain the Perfect suffix *-is-* ~ *-er-*; *-ēre.3PL* is cumulative: Fusion.

Phonotactic and phonological adjustments. In the Inflective, Conj. 1 interfix *-ā-* is truncated before vocalic endings (7e) and exemplifies a general alternation in quantity phonologically conditioned by following desinences (7f). The long interfix vowels of Conj. 2, 4 shorten in hiatus, e.g., *monē-re.INF* *mone-ō.PRS.INFV.1SG*, *finī-re*, *fini-ō*. Inflection within each of the aspects is fairly transparent.

Among the irregular verbs there are instances of (i) stem suppletion yielding wordforms that combine lexical and grammatical content, (ii) stems with ambiguous aspect (*pluit.PRS/PRF.3SG* ‘rains/rained’), and (iii) a few stems with aspect or voice meaning that overrides that of their inflection, e.g., *ōd-ī* ‘hate’, *me-min-ī* ‘remember’ (Inflective meaning despite Perfective form), *ūt-or* ‘use’, *fru-or* ‘enjoy’ (Active meaning despite Passive form): Introflexion.

The typological paradigm of Latin verb inflection is in Table 15. In the typological paradigm (Table 15) I leave aside basic-stem formation to focus on obligatory grammatical categories. The analytic formations, the mainly agglutinative productive conjugations, the fusional Conj. 3 and the introflective suppletive verbs make for an apparent historical perspective. The unproductive patterns reflect (original aorist and perfect) formations from the distant past of the language. The productive formations may have ancient ancestors too (Sihler 2010), as may the Perfective Passive. But in the synchronic view, the transparent productive patterns of inflection and the unproductive ones form a clear reflection of the historicity of the system of conjugation.

2.4 Russian conjugation

The hierarchy of obligatory verbal categories in Russian (7) (Jakobson 1956a) is similar to that of Latin:

(8) PERSON] NUMBER] TENSE] ASPECT] MOOD] VOICE]

Table 15: Latin conjugation in typological perspective

Analytic	Auxiliated Perfective Passive and Perfective of deponent verbs: ‘be’ + PST.PASS.PTCP; auxiliated Future: ‘be’ + FUT.PTCP
Agglutination	Suffixal Perfective -v-/-u- in Conj. 1, 2, 4. Regular Tense and Participant inflection within each aspect. Mainly agglutinative; some phonotactic and phonological adjustments.
Fusion	Tense and Indicative vs Subjunctive are cumulative; Tense suffixes indicate Aspect; Conj. 3, 4 Future -a/e- allomorphy indicates person; P.P.P.: -t- ~ -s-, e.g., <i>mittō-missus</i> , <i>cadō-cāsus</i> , <i>tendō-tensus</i> . Participant desinences: Some indicate Aspect; some are cumulative, especially Passive. Unproductive Perfective stem formation (Conj. 3): Types <i>capiō-cēpī</i> , <i>rumpō-rūpī</i> , <i>agō-ēgī</i> , <i>currō-cucurrī</i> , <i>tangō-tetigī</i> ,
Introflexion	(i) Suppletion: <i>ferō-tulī-lātum</i> , <i>tollō-sustulī-sublātum</i> ; <i>sum</i> , <i>es-</i> , <i>sunt</i> , <i>eram</i> , <i>fuī</i> , <i>possum-potuī</i> ; <i>volō</i> , <i>vīs</i> , <i>vult</i> , <i>velle</i> ...; (ii) Stems combining lexical and grammatical content, despite inflection: <i>ōdī</i> ; <i>frūor</i>

Voice: The Passive is analytic: ‘be’ + PST.PASS.PTCP; the Passive–middle voice is agglutinative, expressed by a fixed verbal clitic with phonologically conditioned allomorphy (=s’a ~ =s’).

Mood: The Irrealis is agglutinative; it is expressed by Past tense or Infinitive plus the movable enclitic =by. The Imperative–Hortative is inflected for Person and enclitic Number (=te; see below). The clitics follow person, gender, and (in participles) case desinences; possible clitic orders are: =sja/s’=by, =te=s’.

Aspect: Russian aspect is often characterized as derivational (thus Wiemer 2022 [this volume]). It is in fact expressed by stem affixation, but Aspect differs from all lexical derivational categories in the language by being an obligatory grammatical category.

In a discussion of morphological techniques a first distinction must be made between the non-obligatory semantic categories of essentially monoaspectual

“procedural” verbs², which will not be discussed here. We will focus on the “basic” non-procedural verbs. As Imperfectives these represent states or activities, and as Perfectives they represent results of activities.

The foundation of this lexico-grammatical category is a large and open class of simplex Imperfective verbs (9a) and a few dozen simplex Perfective verbs (9b) (Isačenko 1962: 352–355, 381–385). These two groups of primary simplicia, in which each lexeme combines lexical and aspectual meaning, can be considered introflective. Secondary Perfective verbs are formed from simplex Imperfectives by prefixation (Janda et al. 2013). In (9c) perfectivization is agglutinative. Secondary Imperfective verbs are formed from both primary and secondary Perfectives by suffixation (*-a*, *-va*, *-iva*), regularly accompanied by mutation of stem vowel and/or stem-final consonant and stress displacement. In (9d) imperfectivization is fusional. It must be acknowledged that the vast majority of Russian verbs are old and replete with codified semantic extensions. But the processes of Perfectivization (9c) and Imperfectivization (9d) are perfectly productive and apply to neologisms.

- (9) a. Primary Imperfective. E.g., *pisá-t'* ‘write’, *rabóta-t'* ‘work’;
- b. Primary Perfective. E.g., *liší-t'* ‘deprive’, *da-t'* ‘give’;
- c. Secondary Perfective. E.g., *na-pisá-t'* ‘write’, *s-pisá-t'* ‘copy’, *pod-pisá-t'* ‘sign’, *za-rabóta-t'* ‘earn (lit.: work in)’, *pro-rabóta-t'* ‘study, analyze (lit.: work through)’;
- d. Secondary Imperfective. E.g., *liš-á-t'* ‘deprive’, *da-vá-t'* ‘give’, *s-pís-yva-t'* ‘copy’, *pod-pís-yva-t'* ‘sign’, *za-rabát-yva-t'* ‘earn’, *pro-rabát-yva-t'* ‘study, analyse’.

Tense: The two tenses are Past and Present. The verb *byt'* in addition has a future tense *búd-u* ‘will be’, which serves as auxiliary with Imperfective verbs to present a state or activity as future. The morphological present of perfective verbs regularly has future reference.

Participant categories: Tense suffixes are followed by participant suffixes, Person and Number in the Present tense, Gender or Number in the Past tense. These are mainly agglutinative, but Person and Number are cumulative in the Present.

To these can be added the deverbal (nominal) Infinitive, (adjectival) participles, and (adverbial) gerund. Their expression of Aspect and Tense (or Taxis; Jakobson 1956a) is fusional.

²R *sposoby glagol'nogo dejstviia*; Isačenko (1962: 385–418); <https://russkiyazik.ru/889/>

A key morphophonemic fact of Russian verb inflection is that Infinitive and Past endings begin with consonants, whereas Present and Imperative endings begin with vowels (in the Imperative, alternating with $-\emptyset$). The endings entail different phonotactic adjustments of stems that end in a consonant and stems that end in a vowel.

There are four productive inflection classes (10a–10d). The majority of Russian verbs, which includes most secondary Perfectives, most primary, and all secondary Imperfectives (10a), have a stem in ...*a*- or ...*e*- in Infinitive and Past and a stem in ...*aj*- or ...*ej*- in Present and Imperative. There is evidence from historical morphology and from child speech that synchronically the /j/ is inserted between a stem-final vowel and a vocalic ending (cf. Andersen 1980). The /j/ epenthesis counts as a phonotactic adjustment, compatible with agglutination. The three other productive patterns are fusional: A basic vowel-final stem is modified in Present and Imperative by a suffix-allomorph replacement (10b), by truncation (10c), or by truncation and a mutation of the PRS.1SG stem-final consonant (10d). The mutation is one of several consonant mutations that reduce the number of phonological distinctions in specific derivational and inflectional environments (Andersen 1995), and which are regular in verb inflection.

- (10) a. *déla-t'*–*déla-j-ut* PRS.3PL ‘do, make’, *belé-t'*–*belé-j-ut* ‘whiten’;
 b. *tolk-ová-t'*–*tolk-új-ut* PRS.3PL ‘interpret’;
 c. *mók-nu-t'*–*mók-n⁰-ut*.PRS.3PL ‘get wet’;
 d. *prosí-t'*–*proš⁰-ú*.PRS.1SG ‘ask’

There are (synchronically) underived verbs that pattern with the productive formations (10a) and (10d). In addition to these, there are some two dozen groups of additional simplex verbs with unproductive subregularities. In those, stem allomorphy indicates the grammatical content of endings, that is, they exemplify fusion. A few of them have suppletive stems, e.g., *sést* ‘sit down’: *s'é*-.INF/PST, *s'ád*-.PRS/IMPV; *(po)nját* ‘understand’: *-n'a*-.INF/PST, *-jm*-.PRS-IMPV.

Besides these suppletive verbs there are some that differ from the regular alternation of Infinitive–Past stem and Present–Imperative stem: *éxat* ‘ride’: *jéxa*-.INF/PST, *jéd*-.PRS, *pojezzáj*-.IMPV; *idtí* ‘go, walk’: *i*-.INF, *id*-.PRS/IMPV, *šol*-.PST; *léč* ‘lie down’: *l'é*-.INF, *l'ág*-.PRS/IMPV, *l'og*-.PST; *ést* ‘eat’: *jé*-default, *jed'*-.PRS.PL; *dát* ‘give’: *da*-default, *dad*-.PRS.PL, *daj*-.IMPV; *být* ‘be’: *jést*-.PRS.3SG, *sút*-.PRS.3PL (bookish), *búd*-.FUT.

These suppletive stems cooccur with grammatical morphemes in concatenations that can be viewed as fusional. But some of their alternant stems are limited to, and hence are indexes of, specific grammatical content. In practical terms,

then, they can be considered introflective; compare the similarly ambiguous status of the English Preterite 2 verbs (Section 3, note 3).

Table 16: Russian verb inflection in typological perspective

Analytic	Passive: 'be' + PST.PASS.PTCP. Passive-Middle: verb + =sja/s'	Irrealis: Past or Inf + =by Futures: <i>búdut</i> , <i>stánut</i> + Inf
Agglutination	Aspect: Prefixal Perfectivization; Present, Imperative: /j/ epenthesis: Productive: <i>déla-t'</i> – <i>déla-j-ut</i> , <i>belé-t'</i> – <i>belé-j-ut</i> (10a); unproductive <i>zna-t'</i> type (>20)	Infinitive ...V- <i>t'</i> . Past. ...V- <i>l-</i> + Gender/Number
Fusion	Aspect: Suffixal Imperfectivization in /-a -va -iva/ with mutations and displacement; Productive: <i>tolk-ová-t'</i> – <i>tolk-új-ut</i> : suffix allomorphy (10b); <i>mók-nu-t'</i> – <i>mók-n⁰-ut</i> : V truncation (10c); <i>prosí-t'</i> – <i>proš⁰-ú</i> : V truncation and C mutation (10d). Unproductive: <i>vide-t'</i> – <i>víz⁰-u</i> (> 50), <i>deržá-t'</i> – <i>derž⁰-ú</i> (>30). Unproductive patterns (>180 verbs): <i>davá-t'</i> (+ 2 more), <i>krý-t'</i> (+ 6), <i>bí-t'</i> (+ 4), <i>ží-t'</i> (+ 2), <i>dé-t'</i> (+ 3), <i>žá-t'</i> (+ 4), <i>ple-stí</i> (+ 17), <i>pé-č'</i> (+ 12), <i>nes-tí</i> (+ 6), <i>teré-t'</i> (+ 4), <i>móknu-t'</i> (+ 59), <i>pisá-t'</i> (+ 50), <i>ždá-t'</i> (+ 9).	
Introflection	Aspect: Simplex Perfectives and Imperfectives. Irregular stem alternants (>20 verbs): <i>jéxa</i> –/jed–/pojezžaj–; i–/id–/šol–; l'é–/l'og–/l'ág–; s'é–/s'ád–; -n'a–/jm–; -jé–/jed'–; da–/dad–/daj–; bi–/jést'/sút'/búd–.	

The synchronic overview of Russian verb inflection in Table 16 only partly corresponds to the historical perspective it suggests.

The analytic Futures are quite young, first attested in the 1300s, though as a category, with different auxiliaries, the analytic Future must have originated before the 1000s (Andersen 2006). Also, the productive agglutinative verbs with /j/ epenthesis in the Present are likely younger than the unproductive fusional patterns. At the other extreme, the introflective verbs do include some of the

oldest, and long since unproductive, formations, originally athematic (*ést* ‘eat’, *dát* ‘give’) and infixed presents (*léč’–ljágut* ‘lie down’, *sést’–sjádut* ‘sit down’).

But the agglutinative prefixation (serving Perfectivization) is as old as preverbs in other Indo-European languages; they were grammaticized as Perfectivizers in recent prehistory. The fusional Imperfectivizing suffixation is specific to Slavic and cannot be much younger. Again, the agglutinative Russian Past tense developed as a Perfect in the Middle Ages, being regrammatized as a simple past no later than the 1200s, whereas the analytic PST.PASS with participles in *-en-* and *-t-* has ancient origins.

We are reminded of the English verb system, in which the fusional Preterite 2 is younger than the agglutinative Preterite 1, and the apparent historicity of the system to some extent is at odds with its known history.

3 Conclusion

In this study of paradigms of paradigms I have drawn attention to notable differences between the hierarchical structures constituted by paradigms of morphological categories (Section 1.1) and the mainly flat or mixed flat–hierarchical paradigms of exponent allomorphs (Section 1.2). Such language-particular paradigms of paradigms will long occupy students of morphology, and although they are language-particular a detailed study of them can be expected to yield insights into common and perhaps universal principles that underlie their organization.

Against this background I have looked at the presumably universal paradigm of morphological techniques that defines synchronic typological variation (Section 2). I have limited the definitions of these techniques to the bare bones (Table 1); a discussion of details will be offered elsewhere.

My aim in this regard has been twofold:

First of all, I wished to highlight the fact that synchronic typological paradigms may afford an extraordinary perspective on the historicity of inflectional systems. In each of the systems sketched here the typological paradigm points up the contrast between the less restricted, productive formations and the more restricted, unproductive ones, between the systems’ younger and older parts. This imprint of history by and large reflects the well-known Morphological Cycle (Hodge 1970). True enough, as emphasized in Section 2.1, a synchronic paradigm of morphological techniques is unlikely to directly reflect the historical development of the given system. For languages whose history we know it is clear that besides a main-stream development from analysis to agglutination to fusion to introflexion, there are many renewals that loop back from each of the synthetic types to structurally simpler techniques (Werner 1987, Igartua 2015).

Still, the perceived historicity of any typological paradigm similar to Table 12 and Tables 14–16 implies hypotheses about past developments. In any language that lacks a historical record, this perspective extends an invitation to historical linguists to uncover the actual historical past of the given language through internal reconstruction.

But more importantly, I wished to advocate for an approach to morphological description that acknowledges typological paradigms. In simple, practical terms, the paradigms of morphological techniques that can be observed in language after language show us that only an approach to morphological analysis that captures this synchronic variation can attain descriptive adequacy.

A theory of morphology that presumed all inflection to be agglutinative would be artificial and inadequate (Hockett 1954), not to say useless. A Word-and-Paradigm approach that operates with unanalysed wordforms as if all inflectional systems were introflective is no better. The recent advance into the dead end of Word-and-Paradigm theory by Stump & Finkel (2017) divides the wordforms of inflectional paradigms into stable and alternating fragments (termed “themes” and “plats”) that are divorced from both lexical and grammatical content; e.g., Fr. *mouvoir* ‘move’: M- + -uvwar, -ø, -uv, -œv, ...; *mourir* ‘die’: M- + urir, -urō, -œr, -or; or *moudre* ‘grind’: MU- + -dr, -l, -ly...). This approach achieves descriptions that are truly meaningless.

Due attention to synchronic variation in inflectional morphology – stylistic, inflection-class, allomorphic, and typological – and to the innovations that give rise to such variation will convince the interested linguist of the priority – in the minds of speakers – of productive patterns over unproductive ones, of regular patterns over irregular ones, and of speakers’ concern with ultimate elements of exponence and their correlations with elements of meaning (symbolic as well as indexical).

Since all such variation reflects the speakers’ competence, it must be acknowledged in any theory of morphology, and recognized as an inomissible part of any adequate synchronic description.³

Abbreviations

1	first person	ABL	ablative
2	second person	ACC	accusative
3	third person	COND	conditional

³I am grateful to Lars Heltoft and Lene Schøsler for their insightful comments on an early draft of this paper.

CONJ	conjugation	N	neuter
DAT	dative	NOM	nominative
F	feminine	P.P.P.	past passive participle
FR.	French	PASS	passive
FUT	future	PFV	perfective
GEN	genitive	PL	plural
IMPF	imperfect	PLUP	pluperfect
IMPV	imperative	PRF	perfect
IND	indicative	PRS	present
INF	infinitive	PST	past
INFV	inflective	PTCP	participle
IPFV	imperfective	R	Russian
LAT.	Latin	SBJ	subjunctive
LOC	locative	SG	singular
LIT.	literally	VL	voiceless
M	masculine		

References

- Andersen, Henning. 1980. Russian conjugation: Acquisition and evolutive change. In Elizabeth C. Traugott (ed.), *Papers from the Fourth International Conference on Historical Linguistics*, 285–301. Amsterdam: John Benjamins.
- Andersen, Henning. 1995. Consonant reduction in Russian. In Henrik Birnbaum & Michael S. Flier (eds.), *The language and verse of Russia. In honor of Dean S. Worth on his sixty-fifth birthday*, vol. 2 (UCLA Slavic Studies. New Series), 19–30. Moscow: Vostočnaja literatura RAN.
- Andersen, Henning. 2006. Periphrastic futures in Slavic: Divergence and convergence. In Kerstin Eksell & Thora Vinther (eds.), *Change in verbal systems: Issues in explanation*, 9–45. Bern: Lang.
- Andersen, Henning. 2020. Synchrony, diachrony, and indexicality. In Bridget Drinka (ed.), *Historical linguistics 2017*, 163–182. Amsterdam: John Benjamins.
- Anttila, Raimo. 1972. *An introduction to historical and comparative linguistics*. New York: Macmillan.
- Anttila, Raimo. 1989. *Historical and comparative linguistics*. First edition: An introduction to historical and comparative linguistics. New York: Macmillan, 1972. Amsterdam: John Benjamins.
- Bloch, Bernard. 1947. English verb inflection. *Language* 24. Reprinted in Joos (1963: 243–254), 414–441.

- Bloomfield, Leonard. 1933. *Language*. New York: Henry Holt & Co.
- de Saussure, Ferdinand. 1959 [1916]. *Cours de linguistique générale*. New York: McGraw, Hill.
- Grevisse, Maurice. 1961. *Le bon usage: Grammaire française*. Gembloux, Paris: Geuthner, Paul & Duclot, J.
- Hamp, Eric P. 1966. *A glossary of American technical linguistic usage 1925–1950*. Utrecht: Spectrum.
- Hockett, Charles F. 1954. Two models of grammatical description. *Word* 10. Reprinted in Joos (1963: 386–399), 210–231.
- Hodge, Carleton T. 1970. The linguistic cycle. *Language sciences* 13. 1–31.
- Igartua, Iván. 2015. From cumulative to separative exponence in inflection: Reversing the morphological cycle. *Language* 91. 676–722.
- Isačenko, Aleksandr V. 1962. *Die russische Sprache der Gegenwart, Teil 1: Formenlehre*. Halle (Saale): Niemeyer.
- Jakobson, Roman. 1956a. *Shifters, verbal categories and the Russian verb*. Reprinted in his *Selected writings*, vol. 2. *Word and language*, 130–147. The Hague: Mouton, 1971. Cambridge, MA: Harvard University Press.
- Jakobson, Roman. 1956b. Two aspects of language and two types of aphasic disturbances. In Roman Jakobson & Morris Halle (eds.), *Fundamentals of language*, 53–82. Reprinted in Roman Jakobson, *On language*, ed. by Waugh, Linda R. & Monville-Burston, Monique, 115–134. Cambridge MA: Harvard University Press, 1990. The Hague: Mouton.
- Janda, Laura A., Anna Endresen, Julia Kuznetsova, Olga Lyashevskaya, Anastasia Makarova, Tore Nessel & Svetlana Sokolova. 2013. *Why Russian aspectual prefixes aren't empty: Prefixes as verb classifiers*. Bloomington, IN: Slavica.
- Palmer, F. R. 1987. *The English verb*. 2nd edn. London: Longman.
- Sapir, Edward. 1921. *Language: An introduction to the study of speech*. New York: Harcourt, Brace & World.
- Shapiro, Michael. 1969. *Aspects of Russian morphology: A semiotic investigation*. Cambridge, MA: Slavica.
- Sihler, Andrew L. 2010. *New comparative grammar of Greek and Latin*. New York: Oxford University Press.
- Stump, Gregory T. & Raphael A. Finkel. 2017. *Morphological typology: From word to paradigm*. Cambridge: University Press.
- Werner, Otmar. 1987. The aim of morphological change. In Giuliano Bernini, Onofrio Carruba & Anna G. Ramat (eds.), *Papers from the 7th International Conference on Historical Linguistics*, 591–606. Amsterdam: John Benjamins.

Wiemer, Björn. 2022. No paradigms without classification: How stem-derivation develops into grammatical aspect. In Gabriele Diewald & Katja Politt (eds.), *Paradigms regained: Theoretical and empirical arguments for the reassessment of the notion of paradigm*, 67–125. Berlin: Language Science Press. DOI: 10.5281/zenodo.5675845.