

15 Phonology in the Soviet Union

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Abstract

The paper considers the development of phonological theory in the Soviet Union, both within the context of its origins in the intellectual atmosphere of late 19th and early 20th century linguistics in Russia, and within the light of its later separation into two different frameworks, known as the ‘Moscow’ and ‘Leningrad’ schools. It is shown that both approaches are closely related to other varieties of phonological structuralism, notably the Prague School, and share important similarities in how they addressed issues of phonological analysis. In particular, I argue that many of the analytical choices and controversies were shaped in a significant way by the properties of the phonological grammar of Russian, with which both schools were preoccupied.

Keywords: phonemic analysis · allophony · morphophonology · Russian · historical phonology · alternations · structuralism (linguistics)

15.1 Introduction

This chapter concentrates on the two major ‘schools’ of phonology in the Soviet Union, known as the ‘Moscow’ and ‘Leningrad’ schools. Section 15.2 describes the context of the development of linguistics in Russia and later the Soviet Union from the late 19th century through to the early 1950s, when the two schools more or less assumed their ‘classic’ form. The next two sections offer parallel discussions of the main differences between Moscow and Leningrad phonology with respect to the nature of the phoneme, which was a central question of phonological theorizing for both (Section 15.3), and the analysis of morphophonological alternations (Section 15.4). Finally, Section 15.5 summarizes the distinctive properties of Soviet phonology in the wider context of linguistic theory. It also describes some developments outside the two frameworks discussed in the bulk of the chapter.

15.2 Historical outlook

Both schools of Russian phonology emerged in the 1920s and early 1930s, maturing — and not by accident — at about the same time as other varieties of European structuralism. To understand their development, it will be useful to sketch the context of language sciences in Russia in the foregoing years.

15.2.1 The early 20th century

At the dawn of the 20th century, the study of language in Russia was mostly preoccupied with traditional philological issues. Although pioneering approaches to phonology had been formulated by Mikołaj Kruszewski and Jan Baudouin de Courtenay (Radwańska-Williams, this volume) in the late 19th century, their full theoretical impact would only be felt later. Baudouin de Courtenay himself, after extensive travels, ended up teaching Indo-European linguistics and linguistic theory in St Petersburg; his pupils would often identify as part of a ‘St Petersburg linguistic school’ (which, of course, became the ‘Leningrad school’ once the city was renamed by the Bolshevik authorities). Baudouin’s influence would be felt not just in phonology but also via the morphological and syntactic ideas of the hugely influential grammarian Viktor Vinogradov (1895–1969).

Another significant figure in that period was Filipp Fortunatov (1848–1914), the originator of the ‘Moscow Linguistic School’ and one of Russia’s first important Neogrammarians (for Neogrammarianism, see Salmons, this volume). Fortunatov made contributions to Slavic and Indo-European historical linguistics (notably in the study of Balto-Slavic accentuation), and encouraged the development of dialectological and traditional philological study. He trained notable scholars such as Aleksei Shakhmatov (1864–1920), a leading figure in the study of the Old Russian manuscript tradition and language; the dialectologist and grammarian Dmitrii Ushakov (1873–1942); the Slavic and Baltic philologist Viktor Porzhezinskii (Wiktor Porzeziński; 1870–1925); and the dialectologist, Slavic philologist, and grammatical theorist Nikolai Durnovo (1876–1937). In 1912 the first (and only) cohort of students graduated from the programme in ‘comparative linguistics’ at Moscow University, run by Fortunatov’s pupil and successor Porzhezinskii: one of the two students was Nikolai Trubetzkoy (Battistella, this volume).

The theoretical approach of Fortunatov’s ‘Moscow School’ can be defined by an emphasis on ‘formalism.’ Unlike linguists such as Baudouin de Courtenay, who particularly in his later period insisted on the psychological reality of units of linguistic analysis such as morphemes, or of the influential Ukrainian scholar Aleksandr Potebnya (1835–1891), who paid particular attention to the relationship of language and the mind (for instance, in his theory of the ‘internal form of words’, i. e. the semantic motivation of morphologically complex words), the Moscow School focused on the use of formal criteria in linguistic analysis. An example is Fortunatov’s analysis of parts of speech, as presented in his lecture notes published as [Fortunatov \(1956\)](#): it rejected the traditional semantically informed classification in favour of one emphasizing morphological criteria. This approach was to play an important rôle in later Moscow developments.

15.2.2 Developments in the 1920s

Following the revolutions of 1917 and the upheaval of the Civil War, linguistics in Russia remained highly productive. In the 1920s it was largely concentrated in universities; Moscow and Leningrad Universities played a central rôle, while formerly important regional centres such as Kazan and Kharkov went into relative decline.

Traditional philological and grammatical work continued, overseen by scholars in the Neogrammarian mould such as Afanasii Selishchev (1886–1942). An active milieu of literary

critics and scholars, as well as theoretical linguists — the latter group including Roman Jakobson (1896–1982), Evgenii Polivanov (1891–1938), and Lev Yakubinskii (1892–1945) — coalesced around the grouping known as OPOYAZ (for *Society for the Study of Poetic Language*) and around the Moscow Linguistic Circle, founded in 1915. These ‘formalists’ were concerned with the *structure* and *use* of language, verse, and literary text, and it is not too difficult to discern the links between this preoccupation and the Fortunatov’s school’s lessened emphasis on ‘psychologism.’¹

Linguistic research was also happening in other venues. Importantly for the development of phonology, the new authorities embarked on an intensive programme of language planning, starting with a spelling reform for Russian and moving on to the creation of alphabets for the indigenous minority languages of the Soviet Union (Martin 2001; Grenoble 2003). It was led by the All-Soviet Central Committee for the New Alphabet (1925–1937), which supported the work of specialists such as the Finno-Ugric linguist Dmitrii Bubrikh (1890–1949) or the Mongolist Nikolai Poppe (1897–1991). In the context of the history of phonology, a particularly relevant figure is the Caucasologist Nikolai Yakovlev (1892–1974), who in his capacity as head of the Committee’s Technographic Commission led the work of creating the alphabets (see Section 15.3.3 below). Some research institutes also housed linguists, such as several member institutions of RANION (The Russian Association of Research Institutes in the Social Sciences), whose linguistic section was led by Polivanov.

15.2.3 The Marr hiatus

Linguistics in the Soviet Union took a dramatic turn in the late 1920s, not least with the advent of ‘the New Doctrine of Language’ (*новое учение о языке*) associated with the name of Nikolai Marr (1865–1934; see Slezkine 1996; Alpatov 2004; Brandist 2015 for detailed studies).² Marr, who had made his name in the pre-revolutionary era as a Caucasologist, veered towards grand theories of language origins and evolution and rejected traditional etymology and the 19th century model of language history based on divergence. Instead, he envisaged language change as the product of hybridization between already existing varieties, emphasizing convergence driven by external events. This led him to a Marxist interpretation of his New Doctrine, whereby language change was triggered by socioeconomic change and class struggle.

Marr did raise some important questions, such as the origin and evolution of language, the rôle of convergence in the history of languages,³ and the importance of typological analysis. For the most part, however, the New Doctrine was essentially pseudoscientific, rejecting accepted methods of linguistic scholarship, impervious to falsification by inconvenient data and deflecting criticism by a crude shield of pseudo-Marxist jargon. Nevertheless, beginning in the late 1920s and particularly after Marr’s death in 1934 it was elevated to the status of orthodoxy. Some linguists active in the 1920s moved to the Marrist camp; those who did not subscribe to its

¹The literature on ‘Russian Formalism’ is enormous; some useful overviews are Erlich (1973) and Steiner (1995). See also Glanc & Pilshchikov (2017) specifically on the relationship between OPOYAZ and the Moscow Linguistic Circle.

²See also Dmitriev (2016) for a useful comparison of Marr and Baudouin’s ideological backgrounds.

³Thus, both Alpatov (2004) and Sériot (2012) point out that Marr’s emphasis on convergence can be seen in the same context as Trubetzkoy’s discovery of *Sprachbünde*.

tenets found themselves marginalized (as with Lev Shcherba; see Section 15.3.2 below), if not persecuted outright (Polivanov, Bubrikh).

There were also major organizational changes. The relatively informal ‘circles’ of the early 1920s ceased, partly due to personnel changes as scholars emigrated or moved on to different interests, and partly due to concerted ideological criticism aimed at ‘formalism’ in art. Moreover, the early 1930s saw a reorientation of research capacity towards specialized institutes within the Academy of Sciences system, and universities lost much of their importance (in both Moscow and Leningrad Universities linguistics departments were closed and merged with smaller institutions). In linguistics, pride of place belonged to the Japhetic Institute in Leningrad, founded by Marr himself; it was renamed the Institute of Language and Thought and remained the leading centre of linguistic research throughout the 1930s.

Although Marrism hit orthodox historical linguistics on Neogrammarian lines harder than phonology, whose concerns were fairly marginal to the Marrists, the energy of the 1920s somewhat dissipated in that era. The New Doctrine of Language remained, at least rhetorically, the official line until 1950. Its dominance came to an abrupt end when, at the height of a renewed bout of Marrist repression, Joseph Stalin himself weighed in with a *Pravda* article entitled *Marxism and questions of linguistics*, in which he⁴ denounced Marrism and proclaimed traditional philology to be the only scientific approach to the study of language.

Although phonological theory came out ‘into the open’ again in the 1950s, some of the most important scholars of the preceding period had been swallowed up in the Marrist tide and general Stalinist repression. Nikolai Yakovlev had become a proponent of the New Doctrine, and after its fall he was fired, never to return to active research. Many linguists were caught up in the purges, including a large series of show trials known as the ‘Slavicist Trial’ («Дело славистов»), where émigrés including Jakobson and Trubetzkoy were named as the alleged instigators. Nikolai Durnovo and Evgenii Polivanov were executed, while other linguists such as Afanasii Selishchev and Viktor Vinogradov were arrested and imprisoned.

Nevertheless, important work in both the Moscow and Leningrad traditions *was* done in the 1930s and 1940s. A group of active phonologists (see Section 15.3.3 below) worked in the Moscow City Pedagogical Institute; also in Moscow, an Institute of Russian Language was opened within the Academy of Sciences in 1944, partly as a counterweight to the Institute of Language and Thought in Leningrad.⁵

It is important to remember that early Soviet linguists were very much part of the same intellectual currents that gave birth to the Prague school (on which see Battistella, this volume). Jakobson and Trubetzkoy, of course, had themselves belonged to the intellectual milieu of 1910s and 1920s Russia, and other links between Russia and Europe (particularly Prague) would persist: for instance, Nikolai Durnovo spent a few years in Czechoslovakia in the 1920s before being forced to return. During the Marr period, however, these links weakened, and by the time something resembling normal service resumed, phonology in the Soviet Union had become estranged from developments that led to mid-century structuralism (Ladd, this volume; Basbøll,

⁴Or rather, perhaps, Arnold Chikobava (1898–1985), an uncompromising opponent of Marrism, who had Stalin’s ear on the matter. For a recent discussion of Stalin’s article, see Dobrenko (2015).

⁵In 1950, after the fall of Marrism, part of the Institute of Russian Language was organized separately as the Institute of Linguistics, and the Leningrad institute was later made a branch office of this new institution — a situation that would continue until 1991.

this volume), and to generative phonology (Dresher & Hall, this volume). It did not help that Neogrammarianism was now the proclaimed ‘Marxist’ creed, and other theoretical approaches, no matter how closely related intellectually to Soviet ones, were tarred with the ‘bourgeois’ brush. This was vividly demonstrated by the so-called ‘discussion on the phoneme’ of the mid-1950s, occasioned by the publication of [Shaumyan \(1952\)](#). His attempt to (re-)import structuralist thinking, with particular reference to the Praguians and to Hjelmslev (Battistella this volume; Basbøll this volume), was met by harsh criticism as ‘idealist’ (for instance, by [Bernshteĭn 1952](#)) — that is, ideologically suspect (for accounts of the Shaumyan controversy, see [Milivojević 1970](#); [Reformatskiĭ 1970](#); [Fischer-Jørgensen 1975](#)).

15.3 The two schools

It is usual to view phonology in the Soviet Union in light of a cleavage between a ‘Moscow school’, continuing the tradition of Fortunatov and the ‘Russian formalism’ of OPOYAZ and the Moscow Linguistic Circle, and a ‘Leningrad school’, heirs (rhetorically at least) to Baudouin’s ‘psychological’ approach. This is a fair distinction to make, although a rapprochement between the two frameworks was not at all impossible.

Most of the early theoretical work in Russian and Soviet phonology concentrated (with a few notable exceptions) on the analysis of the Russian language. It should therefore not be surprising that the kinds of questions that theoreticians mainly sought to address were significantly shaped by Russian phonology. To facilitate the discussion, the next section briefly describes the kinds of data these analysts faced.

15.3.1 The Russian backdrop

Any analysis of Russian has to contend with extensive patterns of allophony and morphophonological alternations (see, for instance, [Hamilton 1980](#); [Cubberley 2002](#); [Timberlake 2004](#)). Some of them have a straightforward phonetic or phonological rationale, whilst others are more complex.

Final devoicing, voicing assimilation and vowel reduction belong largely to the former class. Word-final obstruents devoice in Modern Standard Russian:

- | | | | |
|-----|----|------------|---------------|
| (1) | a. | [ˈrʲɪb̥-ə] | ‘fish-NOM.SG’ |
| | b. | [ˈrʲɪp] | ‘fish.GEN.PL’ |
| | c. | [ˈʔap̥-ə] | ‘paw-NOM.SG’ |
| | d. | [ˈʔap] | ‘paw.GEN.PL’ |

Obstruent clusters also agree in voicing: [ˈrʲɪp̥-k̥-ə] ‘fish-DIM-NOM.SG’, *[ˈrʲɪbk̥ə].

Unstressed vowel reduction is another pervasive pattern. In particular, [o] occurs in stressed but not unstressed position. When unstressed, it alternates with [ɐ], as does stressed [a]. Many lexical items in Russian show various kinds of stress mobility in inflection and derivation, creating alternations such as the following:

- (2) a. [ˈvɔd-i] ‘water-NOM.PL’
 b. [vɛ̞d-a] ‘water-NOM.SG’
 c. [ˈtrav-i] ‘grass-NOM.PL’
 d. [trɛ̞v-a] ‘grass-NOM.SG’

Several patterns relate to palatalization. Vowels show allophony depending on the palatalization of surrounding consonants. In particular, [a o u] are generally higher and fronter in the neighbourhood of palatalized consonants: the vowel in [ˈpat] ‘stalemate’ is different from the vowel in [ˈpiatʲ] ‘five’. The front non-low vowels, on the other hand, present a famous complication.

The vowel /e/ is (for historical reasons) found in three contexts: after palatalized consonants (although recent borrowings do allow it after non-palatalized ones); in syllable-initial position; and following [ʃ ʒ ʦ]. In the two latter contexts, its allophone is traditionally described as a low mid, i. e. relatively back, [ɛ], as opposed to higher and relatively front [e] after palatalized consonants. This pattern of front-back allophony is identical to those seen with [a o u]. The high non-back vowels, however, behave differently. Traditionally, the sound appearing after non-palatalized consonants (but not syllable-initially) is interpreted as central unrounded [ɨ]. This [ɨ] is in complementary distribution with [i], which appears following palatalized consonants and syllable-initially:

- (3) a. [ˈbɨ] ‘be-PAST-MASC.SG’
 b. [ˈbi] ‘hit-PAST-MASC.SG’
 c. [ˈi] ‘silt’
 d. * [ˈɨ]

In fact, as has been known already to [Tomson \(1905\)](#), ‘[ɨ]’ in modern standard Russian does not have a stable quality: it starts with a low F2 transition that converges with the F2 values characteristic of [i] ([Padgett 2001](#)). However, this fact has not been prominent in Soviet debates, which concentrated on the phonological patterning.

In particular, we can observe alternations like those in (4): the addition of the prefix [s] (here used to form the perfective) changes the context. The unprefixated form has the syllable-initial variant [i], and the prefixed form shows [ɨ], as expected after a non-palatalized consonant:

- (4) a. [igˈra-tʲ] ‘play-INF’
 b. [s-igˈra-tʲ] ‘PREFIX-play-INF’

Other kinds of alternations do not depend quite as much on the phonological context, and indeed appear phonologically arbitrary. Especially egregious in this respect is the verbal paradigm. Under the traditional view, all Russian verbs possess two irreducibly different stems that appear in specified paradigm cells: a ‘present stem’ and an ‘infinitive stem’. Descriptively, there are many productive and unproductive inflectional classes defined by the relationships between the shapes of these two stems (for instance, [Zaliznyak 1977](#) counts 16 verbal classes and [Timberlake 2004](#) posits 21), and these relationships often appear quite arbitrary; this can be seen in the examples in [Table 15.1](#), where the underlining shows the ‘stem’ portion and the hyphens indicate other morpheme boundaries.

Infinitive	Present 3rd singular	Gloss
<u>br</u> 's-a-tʃ	<u>br</u> 's-aj-it	'throw'
' <u>pl</u> ak-ə-tʃ	' <u>pl</u> atʃ-it	'weep'
'tr <u>ie</u> b-əvə-tʃ	'tr <u>ie</u> b-uj-it	'demand'
' <u>ʒ</u> d-a-tʃ	' <u>ʒ</u> d-ot	'wait'

Table 15.1: Examples of Russian verbal classes

(a) 'to scream'			(b) 'to wait'		
Person	Singular	Plural	Person	Singular	Plural
1st	v <u>ɛ</u> 'pʲi-u	v <u>ɛ</u> 'pʲi-m	1st	' <u>ʒ</u> d-u	' <u>ʒ</u> dʲ-o-m
2nd	v <u>ɛ</u> 'pʲi-f	v <u>ɛ</u> 'pʲi-te	2nd	' <u>ʒ</u> dʲ-o-f	' <u>ʒ</u> dʲ-o-te
3rd	v <u>ɛ</u> 'pʲi-t	v <u>ɛ</u> 'pʲi-a-t	3rd	' <u>ʒ</u> dʲ-o-t	' <u>ʒ</u> d-u-t

Table 15.2: Examples of morphologically conditioned alternations

In addition, Russian verbs show other morphologically restricted alternations. The present tense paradigms of two verbs belonging to two different 'conjugations' (i. e., taking two different sets of present-tense inflections) exemplify this in Table 15.2. In both cases, stem-final consonants in certain cells undergo additional alternations: the shape of the alternation depends on the consonant, but the triggering context is apparently best expressed in morphological terms, with reference to paradigm cell and 'conjugation class', over and above the 'dual-stem' dichotomy.

In what follows we will see how this diversity of sound patterns informed the kinds of questions Russian phonologists asked and the answers they gave.

15.3.2 The Leningrad tradition

The Leningrad tradition in phonology is primarily associated with Lev Shcherba (1880–1944). He studied in Paris, notably under Jean-Pierre Rousselot and Paul Passy, and was largely a phonetician rather than a phonologist; he also worked with Antoine Meillet and later, in St Petersburg, with Baudouin. Shcherba set up a phonetic laboratory at St Petersburg University as early as 1909, and his phonological thinking always remained tightly bound up with his phonetic interests.

His Master's thesis (Shcherba 1912) was an early but influential account of his views. Shcherba builds on Baudouin's major idea that the physical realization of a sound is distinct from its abstract, 'psychological' representation, and accepts that speakers of each particular language categorize individual pronunciation events into a finite number of types. His crucial theoretical innovation was to unite this inheritance with the importance of lexical contrast highlighted by phoneticians such as Henry Sweet and Paul Passy (cf. Fischer-Jørgensen 1975), by focusing on the possibility of expressing lexical distinctiveness in a given language as the defining criterion of phonemic status. Shcherba discusses how languages differ in whether they treat the

difference between a particular pair of sound types as meaningful: so, for instance, in Russian the distinction between a [e] and [ɛ] driven by the palatalization of surrounding consonants (as in [ˈdʲetʲi] *deti* ‘children’ vs. [ˈdʲetʲkʲi] *detki* ‘children-DIM’) is real, but is not easily perceived by untrained speakers, and not used to make semantic distinctions. Conversely, in French the same distinction between [ˈde] *dé* ‘die, cube’ and [ˈdɛ] *dais* ‘niche’ is both meaningful and easily available to speakers.

Initially, Shcherba gives the following definition of the phoneme: ‘the briefest general phonetic representation of a given language that is able to be associated with semantic representations and differentiate between words and that can be distinguished in speech without changing the phonetic content of the word’ (Shcherba 1912: 8).⁶ Crucial for his conception is the difference between a ‘phoneme’ and a ‘shade’ (*оттенок*, as in a colour shade), with ‘shade’ differences being non-distinctive in the given language (that is, shades are equivalent to the ‘allophones’ of later phonemic theory). For Shcherba (1912), these terms are useful as descriptions of the functions of differences between physical, real sounds; he even appears to go so far as to say that ‘phonemes are those shades that are the least affected by the surrounding context’;⁷ in other words, he essentially identifies the phoneme and its ‘basic allophone’. In later work, this position is revised (or at least clarified), and phonemes are explicitly defined as properly abstract units of linguistic analysis, whilst shades are physical events. In other words, phonemes represent types and shades represent tokens:

[There exists] a relatively small number of sound types that are able to distinguish words and their forms [...] It is these sound types that are meant when referring to individual *speech sounds*. We will call them *phonemes*. The different sounds that are actually pronounced, which are the specific phenomena realizing the general (the phoneme), we will call *phoneme shades* [original emphasis].⁸ (Shcherba 1937: §16)

For Shcherba, phonemic analysis requires taking a set of pre-existing distinctions between sounds (see below Section 15.3.4 on how these are identified) and deciding whether a distinction is phonemic within the particular language, insofar as it is put to certain uses — specifically, insofar as it can create lexical contrasts. In this respect, Shcherba’s conception of phonology is what we might today call ‘functionalist’ in orientation: phonemic status is at the centre of attention, but unlike the more ‘formal’ approach of the Moscow school (see Sections 15.2.1 and 15.3.3) it is primarily a particular way of manipulating ‘raw’, pre-existing linguistic material (phonetic differences) to achieve certain ends (lexical contrastiveness).

This orientation was shared by Evgenii Polivanov. Due to his vigorous opposition to Marrism, he was unable to hold a post in Moscow or Leningrad, and was forced to move to Central Asia,

⁶«[К]ратчайшее общее фонетическое представление данного языка, способное ассоциироваться со смысловыми представлениями и дифференцировать слова и могущее быть выделяемо в речи без искажения фонетического состава слова.»

⁷«[Ф]онемами являются те оттенки, которые находятся в наименьшей зависимости от окружающих условий» (Shcherba 1912: 12).

⁸«[С]равнительно небольшое число звуковых типов, способных дифференцировать слова и их формы... Эти звуковые типы и имеются в виду, когда говорят об отдельных *звуках речи*. Мы будем называть их *фонемами*. Реально же произносимые различные звуки, являющиеся тем частным, в котором реализуется общее (фонема), будем называть *оттенками фонем*.»

where he was caught up in the Stalinist purges of the 1930s, imprisoned, and executed on a trumped-up charge of spying for Japan. He published relatively little, especially after 1931, and his work only reacquired some influence after the fall of the New Doctrine.

Polivanov was a polyglot with a particular interest in Asian languages; among other things, his pioneering analysis of Japanese pitch accents (Polivanov 1915) initiated the modern understanding of this phenomenon, and he made several specific diachronic proposals, especially relating to the reconstruction and classification of Japanese and Korean. Polivanov worked extensively on Turkic, Iranian, and Sinitic languages, and was active in language planning. He was also a productive theorist, maintaining links with Jakobson and Trubetzkoy and publishing in the Prague *Travaux*.

Where Shcherba sought to recast Baudouin's 'psychophonetics' as a 'phonology' grounded in observable differences, Polivanov remained truer to their teacher's 'psychological' emphasis and retained a strong interest in the relationship between the structure of language and the mind of its speakers (notably, he never abandoned the term 'psychophonetics'). He was particularly interested in theorizing about language change (see his selected essays in Polivanov 1974), distinguishing between 'historical phonetics' (the diachronic study of individual languages) and 'phonetic historiology, the general study of principles and causes of phonetic evolution that are valid for all languages.'⁹

Polivanov certainly deserves to be mentioned alongside scholars such as Jakobson, Nicolaas van Wijk, and André Martinet (cf. Fischer-Jørgensen 1975: §§3.16–3.18) as an early exponent of systematic historical phonology, but in fact he prefigured many currents of thought in historical linguistics more generally. He distinguished between phonetically gradual sound changes without phonological consequences and abrupt ('mutational', or 'revolutionary') changes that altered the system of phonemic contrasts, arguing that the latter are normally preceded, and triggered, by the former (cf. Labov 2010). He argued that phonemic 'convergences' and 'divergences' (mergers and splits) should not be treated in isolation, insisting on the fundamentally interconnected nature of phonological changes. He noticed that most phonemic splits involved mergers: for instance, Polivanov (1968) analyses the fall of the yers in Slavic languages as a split, whereby the existing phonemes /ъ/ and /ь/ split into /∅/ and a vowel phoneme, but crucially in each language the non-zero outcome was an already existing phoneme: /o/ in Russian, /a/ in Serbo-Croat, /e/ in Polish; hence, the generalization is that the development of the yers always involves a phonemic merger (cf. the 'primary split' of Hoenigswald 1965).

This emphasis on phonological conditioning led Polivanov to analyses where changes are triggered by the outcome of other changes. For instance, Polivanov (1924) reconstructs the rise of the *r*-coloured vowels /i/ and /u/ in Japanese dialects as follows: first, the conditioned merger of **i* and **u* after alveolar affricates and fricatives creates a new phoneme /i/; then, the *i* > [i] shift is generalized to all instances of **i*; then, system pressure triggers a similarly unconditioned shift of **u* to a new phoneme /u/. This kind of analysis presaged the prominence of the systematic study of shifts and mergers in much of later thinking in both synchronic and historical phonology (e. g. Salmons & Honeybone 2015).

⁹«[Ф]онетическ[ая] историологи[я], общее учение о действительных для всех языков принципах и причинах звуковой эволюции.» (Polivanov 1928: 30)

More generally, Polivanov explicitly discussed the importance of language acquisition and imperfect learning in language change, and described the trade-off between minimization of effort ('human laziness', as he put it) and communicative success as the leading motivation for change. He also weighed up the rôles of endogenous (motivated by system-internal pressures) and exogenous (due to external circumstances) change, particularly in the context of language planning.

The Leningrad school remained focused on the phonetic basis of phonology, sometimes cast as 'the autonomy of phonetics'. Its ideas informed research in experimental (including perceptual) phonetics and further development of phonemic theory that emphasized the primacy of the phoneme as an independently observable unit, by scholars such as Lev Zinder (1903–1995), Margarita Matusевич (1895–1979), and Liya Bondarko (1932–2007). The Leningrad phonologists' insistence on the primacy of the phoneme led them to reject what they called the 'atomistic' conception of distinctive features, associated primarily with Jakobson (Dresher & Hall, this volume). They disagreed with what they saw as the relegation of the phoneme to a bundle of independently defined primitives, i. e. features (for discussion, see the influential textbook by Zinder 1979, first published in 1960; also useful are Voronkova & Steblin-Kamenskij 1975; Kasevich 1983). For Leningrad phonologists, it was phonemes and oppositions between them rather than any particular features that formed the basic building block of phonological analysis. Features were useful to describe *how* these oppositions were implemented, and there was a distinction between *differential* features (the primary expressions of phonemic contrast) and *integral* features (those whose presence accompanies and therefore signals, but does not directly express, contrast).¹⁰ The reasoning was partly phonetic. Leningrad scholars emphasized the multitude and variability of acoustic and articulatory cues to distinctive features and the inconsistency of cues across different contexts (for an example of this thinking, see Bondarko 1969). The absence of such invariants prompted them to reject Jakobsonian universality of features, and what they saw as the inability of 'atomistic' theory to express the important distinction between differential and integral features. All this led Leningrad phonology to analyse features as contingent *properties* of phonemes rather than universal 'building blocks'.

The functionalist ethos also remained prominent. One visible contributor was the Germanic philologist and (historical) phonologist Mikhail Steblin-Kamenskii (1903–1981). Like Polivanov, he was particularly interested in the systematic study of historical phonology, and made important contributions to the phonological analysis of the North Germanic languages (e. g. Steblin-Kamenskij 1974). Leningrad phonologists applied their thinking to a broad range of languages and phenomena; thus, Steblin-Kamenskii's pupils such as Anatoly Liberman (1937–; Liberman 1984), Jurij Kusmenko (1941–), and Yurii Kleiner (1946–) carried out a broad programme of research in Germanic phonology (particularly prosody), while scholars such as Mirra Gordina (1925–2018) and (among many other contributions) Vadim Kasevich (1945–) tackled the challenges to a 'segmental' model of phonology presented by the 'syllabic' languages of East and South-East Asia (Kasevich 1983; Gordina & Býstrov 1984).

The Leningrad school's view of phonemicization meant that the focus of their phonological analysis was not as closely trained on alternations as in some other approaches. Under their

¹⁰This distinction can usefully be compared to the use of features for contrast and enhancement in Western generative phonology (Stevens & Keyser 1989; Avery & Idsardi 2001; Hall 2011).

approach, an automatic alternation such as that, in Russian, between [b] in ['ribə] 'fish' and [p] in ['ripkə] 'fish-DIM' involves two different phonemes, because /b/ and /p/ are clearly phonemically distinct in the language (cf. ['bar] 'bar' and ['par] 'steam') — even though the appearance of the /p/ is conditioned by the following voiceless obstruent. The burden of distinguishing between such an 'automatic' alternation and a morphologically conditioned one falls onto the separate discipline of *morphophonology*, to which we return in due course. Now, however, we turn to a consideration of the other major strand of Soviet theorizing, which was preoccupied precisely with the phonological import of alternations.

15.3.3 The Moscow school

In the 1920s, the Moscow 'formal' tradition was most fruitfully developed by Nikolai Yakovlev. Although he never presented an extended account of his theoretical ideas, he consistently expressed a view of the phoneme that, whilst taking Baudouin's conception as its starting point, also prefigured Trubetzkoy and Jakobson's approach. In a classic paper, [Yakovlev \(1928\)](#)¹¹ agrees with Shcherba in treating phonemes as abstract representations creating lexical distinctions. However, in line with the Moscow 'formalist' tradition, for Yakovlev the lexically contrastive function is not a property of some independently existing distinctions: it is the ability to implement contrast that creates the distinctions in the first place: '[I]t is not the case that phonemes are identifiable [...] because each individual speaker is conscious of them, but the precise reason speakers are conscious of them is that these sounds fulfil a particular grammatical function in language as a socially elaborated grammatical system' (original emphasis).¹² Yakovlev, who was closely involved in language planning, claimed that this understanding of the phoneme lay behind the intuitions of the creators of non-logographic writing systems (Sproat, this volume; Duanmu & Kubozono, this volume); once the analyst was able to reason their way to these phonemes in non-standardized languages, the creation of new alphabets could be treated as a rigorous discipline.¹³

As noted, Yakovlev became a Marrist and abandoned his earlier work, and the label 'Moscow phonological school', which appeared later, is primarily associated with the names of Ruben Avanesov (1902–1982), Vladimir Sidorov (1903–1968), Petr Kuznetsov (1899–1968), and Aleksandr Reformatskii (1900–1978). All of them, trained under Fortunatov's pupils such as Ushakov and Selishchev, inherited a primary interest in the Russian language (characteristic also of many members of the Moscow Linguistic Circle), and made important contributions to its study over and above phonological theory. Avanesov, Sidorov, and Kuznetsov had extensive training and broad interests in the dialectology and history of Russian, and they were all accomplished fieldworkers. These early Moscow phonologists also took a close interest in written language. Reformatskii had been an OPOYAZ member and held a number of publishing-related jobs, whilst both Avanesov and Sidorov theorized the reformed Russian spelling as a phonemic

¹¹This paper also presents Yakovlev's analysis of Adyghe as having a 'linear' vowel system with only three phonemic vowels /ə a a:/, later taken up by [Trubetzkoy \(1939\)](#).

¹²«[Ф]онемы выделяются [...] не потому, что они сознаются каждым отдельным говорящим, но они потому и сознаются говорящими, что в языке как в социально выработанной грамматической системе эти звуки выполняют особую грамматическую функцию».

¹³For more on Yakovlev, see [Ashnin & Alpatov \(1995\)](#).

system (Avanesov & Sidorov 1930). They were, unsurprisingly, influenced by Yakovlev's work on both phonemic theory and orthography.

For the Moscow school, the distinctive function of the phoneme was also fundamentally important. As a corollary, phonological analysis could not ignore the fact that the possibility of producing phonological distinctions depends heavily on positional factors, and in particular that different positions support different ranges of distinctions; a view that finds its echoes in J. R. Firth's notion of polysystematicity (Battaner Moro & Ogden, this volume) and in the reasoning of Twaddell (1935), who argued against identifying similar sounds as belonging to the same phoneme if they are found in different sets of positions within a language. To return to our example, Russian obstruents contrast in voicing prevocally ([ˈpar] 'steam' is a minimal pair with [ˈbar] 'bar'), but no such contrast is possible before a voiceless obstruent, where all obstruents are voiceless: [ˈrɪpkə] 'fish-DIM' is phonotactically licit, but *[ˈrɪbkə] is not. Consequently, the Moscow school refuses to identify the pre-voiceless obstruent [p] in [ˈrɪpkə] with the prevocalic [p] in [ˈpar], because they stand in different contexts, in clear contrast with the Leningrad position, for which the identity of the two [p]'s is a given, and is not disrupted by distributional considerations.

This move closely parallels Trubetzkoy's postulation of archiphonemes on the basis of distributional criteria, but the key innovation of the Moscow school was to embrace the morphological criterion as a way to resolve the ambiguity. Thus, the word [ˈrɪpkə] 'fish-DIM' is morphologically [ˈrɪp-k-ə] 'fish-DIM-NOM.SG'. The first morpheme can also appear as [ˈrɪb]: [ˈrɪbə] 'fish'. Crucially, this latter is an example of the same morpheme where the consonant in question appears prevocally — that is, in a position that *does* support the full range of laryngeal contrast. Such positions, where contextual influence on the realization of phonemes is minimized, were known in Moscow parlance as 'strong'. So in the important textbook by Avanesov & Sidorov (1945: 41):

The degree of phonetic conditioning of the varieties of a phoneme is different in different conditions; in some positions this degree is greater and in others it is smaller. The position with the smallest degree of conditioning is called *strong*, as opposed to the other positions, called *weak*.¹⁴

Phonemicization in a strong position is uncontroversial: the root-final segment in [ˈrɪbə] 'fish' clearly belongs to the phoneme /b/, as there are no contextual influences on prevocalic obstruents in the language. The key analytic move for the Moscow school was to identify the sounds that appear in weak positions as belonging to the same phoneme as the sounds they alternate with, and more specifically to the phoneme that is revealed when a paradigmatically related form puts the member of the alternating series into a strong position. Consequently, [ˈrɪpkə] 'fish-DIM' is phonemicized as /ˈrɪbka/: the example in strong position is provided by [ˈrɪbə] 'fish' (see below Section 15.5.1 on the question of the /i/ phoneme). By contrast, [ˈlapkə] 'paw-DIM', despite the identical sequence [pk], is phonemicized as /ˈlapka/, cf. [ˈlapə] 'paw'. In other words, where Leningrad phonologists endorsed a conception of biuniqueness essentially identical to that of

¹⁴«Фонетическая обусловленность разновидностей фонемы в разных позициях неодинакова: в одних позициях эта обусловленность большая, в других — меньшая. Позиция наименьшей обусловленности называется *сильной*, в отличие от других позиций, которые называются *слабыми*.»

mid-century North American structuralism (Ladd this volume; see Halle 1963b for discussion), Moscow phonologists rejected it and sought to see morphemes as the level of representation invariant across different contexts.

One consequence of the emphasis on strong positions is the impossibility of unambiguous phonemicization when a phoneme only appears in a weak position. As we saw in Section 15.3.1, unstressed position is weak for vowel quality, but due to stress mobility the phoneme can often be recovered: hence, the [ɐ] in [trɐ'va] 'grass-NOM.SG' is phonemicized differently from the [ɐ] in [vɐ'da] 'water-NOM.SG': the former is /a/ (cf. ['travi] 'grass-NOM.PL') and the latter is /o/ (cf. ['vodi] 'water-NOM.SG'). With some morphemes, however, the vowel is *always* in a weak position, as in [bɐ'ran] 'ram-NOM.SG', which has immobile stress in all inflectional forms and derivatives. The Leningrad approach has no issue with phonemicizing 'ram' as /baran/: the vowel is identical to the 'shade' of the phoneme /a/ in such uncontroversially /a/-containing cases as [trɐ'va], and it cannot belong to /o/, which is (with only a few exceptions) never found in unstressed position. In the Moscow framework, /baran/ and /boran/ are equally plausible analyses. Such irrecoverable neutralization is analysed in classical Moscow phonology by postulating a *hyperphoneme* (a term introduced by Kuznetsov 1941, who attributes it originally to Sidorov). A hyperphoneme is a set of phonemes that do contrast in some positions but are neutralized among themselves in some context, albeit remaining in opposition to other phonemes. Thus, 'ram' is /b{ $\frac{a}{o}$ }ran/, where { $\frac{a}{o}$ } is a hyperphoneme that neutralizes /a/ and /o/ but still contrasts with, for example, /u/ (cf. [bu'ran] 'snowstorm').¹⁵

15.3.4 Morphological criteria in phonemicization

The foregoing discussion of the Leningrad and Moscow schools might give the impression that a key division between the two frameworks is the role of morphological information for phonemic analysis: where Leningrad concentrates on the distinctive function of independently established phonetic differences, Moscow embraces morphological criteria to resolve phonemicization ambiguities in weak position. To an extent, this is true. In particular, Shcherba often used language that apparently implied phonemic distinctions can be established without reference to the morphological structure of words.¹⁶ However, morphological information did in fact play an important rôle in Leningrad phonology. The reason is that Shcherba's focus on lexical distinctiveness only provided a criterion for phonemic *distinction*, but it was not much use as a criterion for phonemic *identity*. If two sounds do not make lexical distinctions, do they necessarily belong to the same phoneme?

Here, Leningrad phonologists sharply criticized scholars such as Trubetzkoy or Daniel Jones, who allowed recourse to phonetic similarity in defining the phoneme. Zinder (1979: 72–3) calls this approach a break with 'the linguistic criterion' and a 'sharp contradiction to the basic postulate of phonology, according to which *the acoustic and articulatory (dis)similarity of sounds does not define their phonemic status*'.¹⁷ Instead, Zinder offers the following morphologically

¹⁵See Spahr (2014) for a recent analysis of positional neutralization building on similar ideas.

¹⁶Eramian (1975) provides careful discussion of this point, although his overall conclusion is that Shcherba was never fully explicit on this issue.

¹⁷«[Р]езко[е] противоречи[е] с основным положением фонологии, согласно которому акустико-артикуляторное сходство или различие звуков не определяет их фонематического статуса» (original emphasis)

informed criterion: ‘for two sounds to be allophones of a single phoneme, they must stand in a relation of complementary distribution within at least one morpheme of a given language.’¹⁸ For instance, the slightly labialized [s^w] found in Russian before rounded vowels is an allophone of the phoneme /s/, because it alternates with plain [s]:

- (5) a. [kɐ's-a] ‘scythe-NOM.SG’
 b. [kɐ's^w-u] ‘scythe-ACC.SG’

By contrast, German or English [h] and [ŋ], whilst standing in complementary distribution, do not show such alternations, and thus their phonemic identity can be rejected without recourse to phonetic similarity. Leningrad phonologists also endorsed the use of morphological boundary placement to decide whether a sound is best interpreted as a single phoneme or a cluster, along lines laid by Trubetzkoy (1939); for in-depth discussion of these issues, see Kasevich (1983); Popov (2004).

Thus, it would not be fair to say that it was the possibility of reference to morphological information that was the major dividing line between Moscow and Leningrad schools, although clearly this information was used in quite different ways. It is, however, certainly true that a major point of contention was presented by the analysis of morphophonological alternations.

15.4 Morphophonology in the Soviet Union

The importance of the complex system of Russian morphophonological alternations, briefly sketched in Section 15.3.1, for the history of generative phonology should be clear from the fact that they provided the empirical material for one of the framework’s key texts, Halle’s (1959) *Sound pattern of Russian*. Perhaps no less important was the innovative paper by Jakobson (1948), where the dual-stem dichotomy in verbs is reanalysed with a single underlying form for each stem instead of two.

Jakobson (1948) capitalized on the generalization that the shapes of the stems are essentially in complementary distribution: consonant-final stems appear before vowel-initial suffixes and vowel-final stems appear before consonant-initial suffixes. In the analysis, this can be captured via rules that (to make a long story short) delete stem-final consonants before consonants, and stem-final vowels before vowels. For instance, the alternation between the stems in [ˈplak-ə-l] ‘he wept’ and [ˈplatʲ-i-t] ‘(s)he weeps’ is derived from a single stem /pláka-/: underlying /pláka-l/ surfaces unchanged (*modulo* vowel reduction), and underlying /pláka-i-t/ undergoes rules whereby a stem-final vowel is deleted before a vowel-initial suffix (Jakobson 1948: §2.21) and /k/ changes to [tʲ] in a polysyllabic stem if followed by /a/ or /o/ before an inflectional vowel (§2.42A). Although it is still unabashedly morphological, Jakobson’s (1948) analysis crucially relies on *derivation* — there is a real sense in which the single underlying stem gets *transformed* into one of the two stems observable in the paradigm (see also Halle 1963a).

Both Soviet schools rejected this approach, and continued the line they traced from Baudouin’s ‘correlatives’ through Trubetzkoy’s ‘morphophonemes’ (Battistella, this volume), described as

¹⁸«[Д]ля того чтобы два звука были аллофонами одной фонемы, они должны быть связаны отношением дополнительной дистрибуции в пределах хотя бы одной морфемы данного языка» (Zinder 1979: 73)

the set of phonemes alternating within a morpheme: ‘To each alternation in the linguistic consciousness there corresponds a *morphophoneme*, that is, the union of all phonemes participating in the relevant alternations, understood as a morphophonological entity.’ (Trubetzkoy 1934: 30)¹⁹ In his analysis of Russian, Trubetzkoy postulated morphophonemes precisely where alternations could not be described as positional allophony or neutralization, such as [‘trud̥i-i-t-sə] ‘(s)he works’ vs. [tru‘z̥-u-sʲ] ‘(I) work’, in contrast to alternations occasioned by, say, word-final devoicing along the lines of [‘trut] ‘work’, phonemicized as /truT/, with an archiphoneme in neutralizing position.²⁰ This pervasiveness of phonologically unmotivated alternations of the former type in Russian convinced both Moscow and Leningrad phonologists of the necessity of a theory of morphophonology to account for these arbitrary phenomena.

15.4.1 The Leningrad school

Within the Leningrad School, phonology embraces only a fairly narrow range of alternations, namely those involving ‘shades’ that do not participate in lexical contrast. Any alternation in which otherwise contrastive sounds appear within the same morpheme is by definition phonemic; this applies equally to a synchronically arbitrary pattern such as in [‘trud̥itsə] ~ [tru‘z̥usʲ] and a positionally motivated one such as [tru‘da] ~ [‘trut] with final devoicing.

Under this régime, even alternations with apparently straightforward phonological rationales are instances of allomorphy. The morpheme ‘work’ can appear phonemically as either /trud/ or /trut/, but this automatic alternation is not different in kind from the morphologically restricted patterns producing /truʒ/, again much as in American structuralism (Ladd, this volume). The difference between the two kinds of alternations lies in their conditioning.

For Leningrad theorists, alternations were primarily important as a by-product of morphology. Kasevich (1985) is probably the most in-depth Leningrad account of morphophonology, and his key argument is that phonemic alternations are to be described with reference to morphology. This follows from the overall structuralist position, in which morphemes are treated as signs in the Saussurean sense. They are therefore endowed with two planes: the *signifiant* and the *signifié*. Elements of either or both of those planes can trigger an alternation: in automatic (i. e. apparently phonological) alternations, the triggering conditions are less specific and refer only to the *signifiant* plane of the context (i. e. surrounding phonemes or phonological boundaries), whereas morphophonological alternations also refer to properties of the *signifié*, such as grammatical category. To support this morphology-centred approach, Kasevich (1983; 1985) argues that even the most apparently straightforwardly phonological alternations often require reference to both the phonological and the morphological context. For instance, he points out that Russian final devoicing applies before clitics: [‘trut] ‘work’, but also [‘trut li] ‘work + question particle’. The clitic is part of the phonological word (as evidenced, for example, by vowel reduction patterns), but not of the morphological word, so the triggering boundary has to be morphological rather than phonological.

¹⁹„Jeder Alternation entspricht im Sprachbewußtsein ein *Morphonem*, d. i. die als morphonologische Einheit gedachte Gesamtheit der an der betreffenden Alternation beteiligten Phoneme.“

²⁰In Jakobson’s (1948) analysis, the verbal stem is /trud̥i-/, which comes out unchanged in the infinitive and as [truʒ] in the 1 SG present by the rule of prevocalic stem-vowel deletion (§2.21) and a palatalization rule applying to underlyingly palatalized consonants in the 1 SG present (§2.41).

Morphophonological alternations were viewed primarily as redundant means of signalling changes in meaning that always accompany a primary exponent (such as an overt morpheme): for instance, German comparatives are formed by the suffix *-er* (*weit* ‘wide’, *weiter* ‘wider, further’), but can also be formed by a combination of the suffix and an *Umlaut* alternation (*warm* ‘warm’, *wärmer* ‘warmer’); the alternation in such cases is morphophonological, since it does not (and cannot) carry the relevant morphological information. Kasevich (1985) provides a lucid exposition, concluding as follows:

[M]orphophonological phenomena are not signs for two reasons: first, they are not independent, [in that] a morphophonological property is always determined by the phono[logical and] morphological context; second, it is typical for identical morphophonological properties to accompany very different grammatical processes that share nothing whatsoever in terms of function and/or semantics.²¹

Using these criteria, Kasevich (1985) rejects the argument by Kubryakova & Pankrats (1983) that morphophonology includes non-concatenative morphology (German *Apfel* ‘apple’, pl. *Äpfel*). Despite the superficial similarity to cases like *warm* ~ *wärmer*, where an identical vowel change accompanies affixation, Kasevich argues that if an alternation can act as the sole exponent of a morphological categories (in German, the plural), it properly belongs to morphology; it is only morphophonological when it cannot act independently (as with the comparatives, which are never formed solely by *Umlaut*). Such reasoning further exemplifies the Leningrad focus on functionalist reasoning; indeed, there was significant interest in rationalizing at least some alternations as bearing a semantic load (Maslov 1979).

Overall, Leningrad phonemic theory necessarily required almost any morphophonological alternation to be conceptualized as involving an interchange of phonemes. As a consequence, Leningrad morphophonology embraced both automatic and morphologized alternations, and in fact sought to emphasize their essential identity rather than draw a hard and fast line between the two kinds (cf. Zinder 1979: §§237–240). The situation was quite different in Moscow.

15.4.2 The Moscow school

The consequences of the Moscow approach to phonemicization for the division of labour between phonology and morphology were drastic, since the very definition of the phoneme required abstracting away from those alternations that were due to a phoneme appearing in a weak position. Alternations such as final devoicing were instances of allophony. A different approach was required for alternations such as [‘trudʲitsə] ~ [tru‘zʊsʲ], where both [dʲ] and [ʒ] are in strong positions.

In fact, the status of these alternations was never satisfactorily resolved. In an influential article, Reformatskiĭ (1955) sharply criticized the morphophonological enterprise, describing non-phonologically driven alternations as the débris of history with no special synchronic

²¹ «[M]орфонологические явления не носят знакового характера по двум причинам: во-первых, они не являются независимыми, та или иная морфонологическая характеристика всегда обусловлена фономорфологическим контекстом; во-вторых, типична ситуация, когда одни и те же морфонологические признаки сопровождают принципиально разные грамматические процессы, не обладающие какой бы то ни было функциональной и/или семантической общностью.» (Kasevich 1985: 31)

status. However, some scholars did attempt elaborating the theory of such alternations, often by postulating a separate level of representation linking phonemic strings to morphological objects.

Churganova (1973) offers one worked-out example. She postulates an autonomous morphophonemic level, and argues that the building blocks of morphemes are not phonemes but rather the units of this level — morphophonemes. However, unlike the North American structuralist ‘morphophoneme’ (Goldsmith 2008; Ladd, this volume; Dresner & Hall, this volume) the relationship between Churganova’s (1973) morphophonemes and phonemes is declarative rather than derivational: morphophonemes are sets of alternating phonemes that occupy the same slot within a morpheme, just like phonemes are sets of alternating allophones. Churganova (1973) justifies the necessity of an autonomous morphophonemic level by noting that morphophonemic regularities cannot always be derived from synchronic morphological structure. A key notion in her theory is the ‘submorph’: a substring that does not submit to synchronic morphological analysis but shows morphophonological behaviour identical to that of homophonous morphemes. Compare the following pairs:

- (6) a. [ku'pʲi-eʃ̌s] ‘merchant-NOM.SG’
 b. [kupʲ-ʃ̌s-a] ‘merchant-GEN.SG’
 c. [ʲkup-tʃ̌j-ik] ‘merchant-DIM’
- (7) a. [ɛgu'rʲeʃ̌s] ‘cucumber-NOM.SG’
 b. [ɛgurʲ-ʃ̌s-a] ‘cucumber-GEN.SG’
 c. [ɛ'gurtʃ̌j-ik] ‘cucumber-DIM’

We can observe that the highlighted portions in (6) and (7) show identical morphophonological behaviour in terms of vowel-zero alternations, the [ʃ̌s] ~ [tʃ̌j] alternation, and stress mobility. However, in (6) the portion /eʃ̌s/ can be morphologically separated from the root (cf. [ku'pʲi-i-tʃ̌j] ‘to buy’), but in (7) there is no obvious morpheme boundary.²²

In practice, an autonomous morphophonology strictly separated from other grammatical components was never particularly popular as a theoretical position. The bulk of morphophonological work remained descriptive, taking a non-committal stance that identified morphophonology as a grey area between phonology and morphology. Although clearly of major descriptive interest, it was rarely theorized as an independent grammatical component; for instance, Bromleĭ (1974) suggests that ‘all linguistic significance inherent in a phonemic alternating series can be entirely divided between the phonology and the grammar.’²³ Bromleĭ accepts that ‘morphophonemes’, as sets of phonemes alternating within a morpheme, are a useful terminological crutch, but she criticizes Trubetzkoy for excessive ‘psychologism’ in treating them as having special status.

Despite this theoretical vagueness, a rich vein of work in morphophonology, continuing the Moscow tradition’s focus on Russian, produced often exceptionally detailed synchronic and

²²One could, of course, analyse *ogur-* as a bound ‘cranberry morpheme’, but this is not the analysis adopted by Churganova (1973).

²³«[В]се языковые значимости, заложенные в фонемном альтернативном ряде, без остатка делятся между фонологией и грамматикой.» (Bromleĭ 1974: 36)

comparative descriptions of the systems of alternations found in both standard and vernacular varieties across the Slavic-speaking world (e. g. [Anan'eva et al. 1987](#); [Tolstaya 1998](#)). This was a major enterprise, which not only amassed a wealth of data but also built up a framework for morphophonological comparison. Its Slavist orientation allowed scholars working in the framework to interact with Slavic scholars in the West interested in (morpho-)phonological topics, such as Dean Worth (e. g. [1970](#); [1972](#)) and Edward Stankiewicz (e. g. [1966](#)). We will return to some of the consequences of this interaction in Section [15.5.2](#).

15.5 Summary and further developments

15.5.1 A distinctive Russian approach?

Although the relationship between the St Petersburg (Leningrad) and Moscow schools has often been framed as antagonistic, phonology in the Soviet Union can be seen as a coherent, independent sibling of the better known European and American varieties of structuralism. Both schools claimed the heritage of Baudouin de Courtenay, insisted on the centrality of the phoneme (rather than the feature) as the primitive of phonological analysis, and emphasized the analytical import of the position with minimal contextual conditioning. In general, Soviet theorists subscribed to similar tenets of grammatical theory and standards of reasoning. Typically, they rejected derivations in favour of a declarative mode of grammatical description: the analysis of an utterance involved a statement of what phones it consisted of, which phonemes these phones represented, which morphophonemes these phonemes belonged to (if applicable), and so on. The description would then map units of one kind to another, drawing on the necessary contextual information, but no derivational relationship, let alone a system of ordered rules, was envisaged.

This had far-reaching consequences for what could be accepted as valid reasoning. Consider the famous disagreement between the major schools regarding the inventory of Russian vowels (see above Section [15.3.1](#)). Moscow phonologists treat both [i] and [i̯], which are in complementary distribution, as belonging to a single phoneme /i/. (This was, unsurprisingly, also the Prague analysis; [Jakobson 1929](#).) The Leningrad phonologists, however, take as their starting point the existence of a phonetic distinction between [i] and [i̯]. It is argued to be phonemic. Leningrad analysts point to the fact that even naïve speakers can easily produce [i̯]-initial words, notably [i̯] ‘the letter <ы>’ and a nonce verb [‘ikəʋ] ‘to say [i̯]’, as well as foreign place-names transcribed with an initial <ы> (and also words derived from such borrowings using Russian native morphology). Further, they point out the lack of parallelism in the fronting allophony in [i] ~ [i̯] and in the other vowels: in the former pair, the front allophone appears syllable-initially, but in all other cases that position is occupied by the backer ‘shade’.

From a generative perspective, we can immediately notice that there is no appeal to information that cannot be extracted from the single-level phonemic representation. Whether we compare the Moscow position to [Halle \(1959\)](#), who derives both [i] and [i̯] from an underlying /i/, or consider the later generative analysis that postulates both /i̯/ and /i/ in underlying representations, like the Leningrad phonologists ([Lightner 1965](#); [Plapp 1996](#)), the generative argumentation is entirely different. It derives the palatalization of consonants from the features

of following vowels in a system of ordered rules, and so the vowel's behaviour with respect to palatalization processes becomes crucial in determining its underlying backness.

Thus, in the generative six-vowel analysis, a suffix /i/ with a [+back] vowel is postulated because it fails to palatalize preceding non-velar consonants ([ˈstol] 'table', plural [stɐˈli]). After velars, this suffix appears as [i], with the velar itself also palatalized: [ˈkrʲuk] 'hook', plural [krʲuˈki]. In the standard generative approach, this follows from a separate rule of post-velar fronting of /i/, followed by the palatalization of velars: /krʲuki/ → /krʲuki/ → [krʲukʲi]. To a certain extent, this dual behaviour is reproducible in a Moscow analysis: the plurals are phonemicized as /stoli/ and /krʲuki/ respectively. In the former case, the phoneme /i/ is realized as [i] due to the preceding non-palatalized consonant. In the latter, an allophonic pattern requires velars to be palatalized before phonemic /i/, meaning also that [i] itself has to be front rather than back, as it is now preceded by a palatalized consonant.

The vowel analysed in the generative approach as /i/ shows a very different pattern. For instance, it triggers the alternation between the [k] of [ˈkrʲik] 'shout' and the [tʃ] of [kriˈtʃit] '(s)he shouts', via a rule of 'velar palatalization'. From a Moscow perspective, this is exactly backwards. It is the palatalization of the affricate that determines the realization of the /i/ as [i] rather than [i]. The consonantal alternation cannot be explained purely from the information available in the phonological context; therefore, the [k] ~ [tʃ] alternation must be 'morphophonological', and has nothing to do with the phonemic analysis of the [i].²⁴

Obviously, the rejection of derivationalism did not prevent Soviet phonologists from producing important analytical insights. Consider the phonology of voicing assimilation in Russian. The voicing of the 'unpaired' voiceless obstruents [tʃ] and [tʃʲ] to [dʒ] and [dʒʲ] before voiced obstruents — a fatal problem for (American) taxonomic phonemics according to the 'origin myth' of generative phonology (Anderson 2000; Ladd, this volume; Dresher & Hall, this volume) — is entirely unproblematic for Soviet frameworks. In Moscow phonology, the voicing of both 'paired' and 'unpaired' obstruents is utterly mundane allophony, since pre-obstruent position is 'weak' for obstruent voicing. In Leningrad, the distinction between [tʃ] and [dʒ] could, in principle, be phonemic, but it is not interpreted as such, because there are no (sub)minimal pairs even of the highly marginal kind seen for /i/. The analysis of these facts by Kasevich (1983) is instructive. Rather than leave these segments unspecified for [±voice] on the basis of them lacking phonemic voiced counterparts, Kasevich interprets /tʃ/ and /tʃʲ/ as phonologically voiceless, since they are triggers of voicelessness assimilation. He justifies a voicelessness specification by reordering the features in Halle's (1959) distinctive feature hierarchy (see Dresher & Hall this volume), so that voicing is assigned before the manner features that distinguish the affricates from other obstruents — essentially the same analysis as that proposed recently by Dresher & Hall (2016). More generally, where phonotactic or morphophonological regularities could be stated in terms of distinctive features, it was quite common to use this kind of appeal to syntagmatic and paradigmatic generalizations to justify representational solutions.²⁵

²⁴This rejection of derivationalism did find sympathy among Slavic specialists in the West familiar with Russian phonological thinking; see, for instance, Darden (1977) for a criticism of the abstract SPE-style analysis of Russian by Lightner (1965; 1972).

²⁵Two random examples should suffice to demonstrate this: Bromleĭ (1974) insists that regularities of morphophonological alternations are best stated in terms of distinctive features; and Sudnik (1975) offers a comparative

The commonality of assumptions underlying differences in opinion between Moscow and Leningrad can be illustrated by the existence of ‘hybrid’ frameworks that tried to unite Leningrad grounding in phonetic reality with the Moscow framework for the analysis of regular alternations. These were often proposed by Moscow phonologists dissatisfied with the indeterminacy forced on the analyst by the overriding importance of the phoneme’s identity in strong position. As we saw in Section 15.3.3, in ‘classical’ Moscow phonology if a phoneme could not be identified, it was left underspecified as a ‘hyperphoneme’. Several phonologists, notably Sergei Bernshtein (1892–1970; an anti-Marrist, he wrote an important paper in the 1930s, which was only published as Bernshtein 1962), Shaumyan (1952), Panov (1967), and eventually Avanesov himself (e.g. 1956) — attempted to assign phonemic status to *all* minimal units of analysis, and viewed higher-level abstract units as generalizations of such ‘phonemes’. For instance, in Avanesov’s conception all weak positions contained ‘weak phonemes’ (never hyperphonemes), whilst strong positions exhibit ‘strong phonemes’. Every position supports a different range of phonemic contrasts, with strong positions allowing more contrasts: hence, the problematic form [bɛˈran] ‘ram’ was phonemicized as /bɑˈran/, with a ‘weak phoneme’ /ɑ/. The set of weak and strong phonemes participating in phonological alternation was treated as a single ‘phoneme series’ (*фонемный ряд*), broadly corresponding to the ‘classical’ Moscow phoneme. This approach, reminiscent of Firthian polysystemicity (Battaner Moro & Ogden, this volume), allowed full phonemicization of strings but avoided the loss of paradigmatic information inherent in the conflation of phonemes across ‘strong’ and ‘weak’ positions in the Leningrad analysis. At the same time, Avanesov identified the set of strong phonemes as the phonemic inventory of the language, reproducing the Trubetzkoyan distinction in status between phonemes and archiphonemes.

Both main currents of Soviet phonology sprang from the same root as European structuralism, and represent a parallel development that maintained a non-derivational focus, a commitment to the primacy of the phoneme, and a strict separation between phonemic analysis and the treatment of ‘non-automatic’ morphophonological alternations. These tenets, together with the complexity of Russian morphophonology, kept both Moscow and Leningrad phonology from attempting to build a unified theory of ‘automatic’ and ‘morphophonological’ alternations. Nevertheless, with their focus closely trained on positional factors in sound patterns, both schools produced valuable descriptive work and sophisticated analyses of patterns of phonological neutralization and contrast.

15.5.2 Postscript: ‘dynamic’ models and morphophonology redux

Finally, it is worth mentioning some currents of Soviet phonological thinking that did not directly grow from the two major schools. Some of them arose from a difference in empirical emphasis: for example, intonation was the focus of work by scholars such as Elena Bryzgunova (1931–; see, for instance, her section on intonation in Shvedova et al. 1980) and Tat’yana Nikolaeva (1933–2015; see Nikolaeva 1977; 1996). Important phonological insights can, of course, also be found in much work that does not concern itself directly with questions of theory: this includes

study of several Slavic and Baltic vernaculars that analyses differences in phonological patterning by appeal to different orderings of features in a contrastive hierarchy very much reminiscent of Drescher (2009).

prescriptive works (Avanesov 1972; Verbitskaya 1990), sociolinguistic explorations (Všotskiĭ et al. 1971; Glovinskaya & Kuz'mina 1974), work on the history of standard pronunciation (Panov 1990), and modern and historical dialectology (Orlova 1970; Kasatkin 1999).

An important source of alternative theoretical approaches was the explosive growth of interest in cybernetics and language processing that began in the 1950s (cf. Dresher & Hall, this volume). It led to highly formalized, mathematically informed modelling of phonemic systems by linguists such as Sebastian Shaumyan (1916–2007) and Isaak Revzin (1923–1974) and mathematicians such as Vladimir Uspenskii (1930–2018). In the end, these approaches were never particularly influential in the Soviet Union, although at the time it attracted considerable attention from Western scholars (Milivojević 1970; Kortlandt 1972; Fischer-Jørgensen 1975).

More generally, however, this approach was part of a movement away from structuralism towards what was generally described as ‘dynamic’ — that is, derivational — models of morphological (and morphophonemic) phenomena. Their credibility was buttressed by the masterful explication of Russian morphology by Andrei Zaliznyak (1935–2017; see Iosad et al. 2018), whose exhaustive formal descriptions of the patterns (Zaliznyak 1967; 1977) remain standard to this day. Zaliznyak briefly trained in Paris under André Martinet, and though he did not focus on functional concerns in phonology that preoccupied Martinet, he mostly worked independently from Soviet theoretical frameworks. In fact, his *œuvre* was not explicitly framed as phonological. Instead, the analysis is closely parallel to ‘Word-and-Paradigm’ models developed at about the same time in the West, notably by P. H. Matthews (e. g. 1974; see Anderson 2016 for discussion): the forms of each lexeme are derived from a single abstract representation via a battery of rewrite rules that convert them to more concrete forms. No claim is laid to any ontologically ‘phonological’ status to the abstract representations: it was an idealized model, but a model that worked extremely well.

Similar approaches were applied to morphologically conditioned stress and accent systems, by Zaliznyak himself (1985) and scholars such as Vladimir Dybo (1931–; see Dýbo 1980; 2000; Dýbo, Zamyatina & Nikolaev 1990): Lehfeldt (2009) gives an overview and critique of the general approach, which is closely related to the Basic Accentuation Principle posited for Indo-European by Kiparsky & Halle (1977). Dynamic modelling was also adopted in work on segmental alternations, often tying in with the morphophonological scholarship described in Section 15.4.2 (Bulýgina 1977; Itkin 2007; Polivanova 2008). It was also the framework of choice for numerous descriptions of the minority languages of the Soviet Union and Russia produced in Moscow from the 1970s onwards (such as, for instance, Kibrik 1977; Kibrik, Kodzasov & Murav'eva 2000). Such descriptions readily adopted a derivational perspective, albeit without necessarily attempting to reconcile it with current phonemic theory. They often involved autonomous morphophonological representations undergoing rules starting from unique underliers, much as in generative phonology. However, in many approaches the outcomes are then converted to orthodox phonemic representations, with attendant statements of allophony to account for regular phonological patterns: for instance, in Itkin's (2007) analysis of Russian two morphophonemes {i} and {i} are postulated on the basis of derivational properties (as in the generative analysis), but then merge into a single phoneme /i/, identified on the basis of the predictable distribution of the two allophones. In embracing derivationalism, ‘dynamic’ models have produced many valuable generalizations whilst maintaining the firewall

between positional and morphologically restricted alternations that is often seen as a necessary consequence of the phonological organization of Russian.

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References

- Alpatov, Vladimir Mikhaïlovich. 2004. *Istoriya odnogo mifa: Marr i marrizm*. 2nd edn. Moscow: Éditorial URSS.
- Anan'eva, Natal'ya Evgen'evna, Maïya Ivanovna Ermakova, Tat'yana Veniaminovna Popova & Svetlana Mikhaïlovna Tolstaya. 1987. *Slavyanskaya morfonologiya: Substantivnoe slovoizmenenie*. Moscow: Nauka.
- Anderson, Stephen R. 2000. [Reflections on 'On the Phonetic Rules of Russian'](#). *Folia Linguistica* 34(1–2). 11–28.
- Anderson, Stephen R. 2016. [Words and paradigms: Peter H. Matthews and the development of morphological theory](#). *Transactions of the Philological Society* 115(1). 1–13.
- Ashnin, Fedor Dmitrievich & Vladimir Mikhaïlovich Alpatov. 1995. Nikolaj Feofanovič Jakovlev (1892–1974). *Histoire Epistémologie Langage* 17(2). 141–161.
- Avanesov, Ruben Ivanovich. 1956. *Fonetika sovremennogo russkogo yazýka*. Moscow: Izdatel'stvo Moskovskogo universiteta.
- Avanesov, Ruben Ivanovich. 1972. *Russkoe literaturnoe proiznoshenie*. Moscow: Prosveshchenie.
- Avanesov, Ruben Ivanovich & Vladimir Nikolaevich Sidorov. 1930. Reforma orfografii v svyazi s problemoi pis'mennogo yazýka. *Russkii yazýk v sovetskoï shkole* 1930/1. 110–118. Excerpted in Aleksandr Aleksandrovich Reformatskiï (ed.). 1970. *Iz istorii otechestvennoï fonologii: Ocherk, khrestomatiya*. Moscow: Nauka, 1970.
- Avanesov, Ruben Ivanovich & Vladimir Nikolaevich Sidorov. 1945. *Ocherk grammatiki russkogo literaturnogo yazýka*. Vol. 1: *Fonetika i fonologiya*. Moscow: Gosudarstvennoe uchebno-pedagogicheskoe izdatel'stvo Narkomprosa RSFSR.
- Avery, Peter & William J. Idsardi. 2001. Laryngeal dimensions, completion, and enhancement. In T. Alan Hall (ed.), *Distinctive feature theory* (Phonetics and Phonology 2), 41–71. Berlin: Mouton de Gruyter.
- Bernshteïn, Sergeï Ignat'evich. 1952. Protiv idealizma v fonetike. *Izvestiya Akademii Nauk SSSR: Otdelenie literatury i yazýka* 11(6). 541–559.
- Bernshteïn, Sergeï Ignat'evich. 1962. Osnovnye ponyatiya fonologii. *Voprosy yazýkoznanija* 1962/5. 62–80.

- Bondarko, Liya Vasil'evna. 1969. [The syllable structure of speech and distinctive features of phonemes](#). *Phonetica* 20(1). 1–40.
- Brandist, Craig. 2015. *The dimensions of hegemony: Language, culture and politics in Revolutionary Russia* (Historical Materialism 86). Leiden & Boston: Brill.
- Bromleĭ, Sof'ya Vladimirovna. 1974. Morfonologiya i grammatika. In Ruben Ivanovich Avanesov (ed.), *Obshchoslavyanskiĭ lingvisticheskiĭ atlas: Materialy i issledovaniya. 1972*, 25–48. Moscow: Nauka.
- Bul'ygina, Tat'yana Vyacheslavovna. 1977. *Problemy teorii morfologicheskikh modelei*. Moscow: Nauka.
- Churganova, Valeriya Grigor'evna. 1973. *Ocherk russkoĭ morfonologii*. Moscow: Nauka.
- Cubberley, Paul V. 2002. *Russian: A linguistic introduction*. Cambridge: Cambridge University Press.
- Darden, Bill J. 1977. O novom napravlenii v generativnoĭ fonologii v SShA. In Vladimir Andreevich Zvegintsev (ed.), *Problemy teoreticheskoi i ėksperimental'noi lingvistiki* 8, 55–70. Moscow: Izdatel'stvo Moskovskogo universiteta.
- Dmitriev, Alexander. 2016. [Philologists–autonomists and autonomy from philology in late imperial Russia: Nikolai Marr, Jan Baudouin de Courtenay, and Ahatanhel Krymskii](#). *Ab Imperio* 2016(1). 125–167.
- Dobrenko, Evgeny. 2015. Linguistic turn à la Sovietique: The power of grammar, and the grammar of power. In Petre Petrov & Lara Ryazanova-Clarke (eds.), *The vernaculars of Communism: Language, ideology and power in the Soviet Union and Eastern Europe* (Routledge Studies in the History of Russia and Eastern Europe 21), 19–39. London & New York: Routledge.
- Dresher, B. Elan. 2009. *The contrastive hierarchy in phonology*. Cambridge: Cambridge University Press.
- Dresher, B. Elan & Daniel Currie Hall. 2016. Trade-offs in the contrastive hierarchy: Voicing versus continuancy in Slavic. *North East Linguistic Society (NELS)* 46(2). 43–56.
- Dybo, Vladimir Antonovich. 1980. Balto-slavyanskaya aktsentnaya sistema s tipologicheskoi točki zreniya i problema rekonstruktsii indoevropeĭskogo aktsenta. In Tamara Mikhaĭlovna Sudnik (ed.), *Balto-slavyanskie ėtnoyazykovye kontaktŷ*, 91–150. Moscow: Nauka.
- Dybo, Vladimir Antonovich. 2000. *Morfonologizovannye paradigmaticheskie aktsentnye sistemy: Tipologiya i genezis*. Moscow: Yazŷki russkoĭ kul'turŷ.
- Dybo, Vladimir Antonovich, Galina Igorevna Zamyatina & Sergeĭ L'vovich Nikolaev. 1990. *Osnovy slavyanskoĭ aktsentologii*. Moscow: Nauka.
- Eramian, Gregory M. 1975. The separation of levels in Shcherba's phonemic theory. *Canadian Slavonic Papers* 17(1). 126–142.
- Erlich, Victor. 1973. [Russian formalism](#). *Journal of the History of Ideas* 34(4). 627–638.
- Fischer-Jørgensen, Eli. 1975. *Trends in phonological theory: A historical introduction*. Copenhagen: Akademisk forlag.
- Fortunatov, Filipp Fedorovich. 1956. Sravnitel'noe yazŷkovedenie: Obshchiĭ kurs. In Mikhail Nikolaevich Peterson, Petr Savvich Kuznetsov & Andreĭ Nikolaevich Robinson (eds.), *Izbrannye trudŷ*, vol. 1, 23–197. Moscow: Gosudarstvennoe uchebno-pedagogicheskoe izdatel'stvo Ministerstva Prosveshcheniya RSFSR.

- Glanc, Tomáš & Igor Pilshchikov. 2017. Russkie formalistŷ kak nauchnoe soobshchestvo. In Yan Levchenko & Igor Pilshchikov (eds.), *Épokha «ostraneniya»: Russkii formalizm i sovremennoe gumanitarnoe znanie*, 85–100. Moscow: Novoe literaturnoe obozrenie.
- Glovinskaya, Marina Yakovlevna & Svetlana Maksimovna Kuž'mina. 1974. Fonetika. In Leonid Petrovich Krŷsin (ed.), *Russkii yazŷk po dannŷm massovogo obsledovaniya: Opŷt sotsial'no-lingvisticheskogo izucheniya*, 41–83. Moscow: Nauka.
- Goldsmith, John A. 2008. [Generative phonology in the late 1940s](#). *Phonology* 25(1). 37–59.
- Gordina, Mirra Veniaminovna & Igor' Sergeevich Bŷstrov. 1984. *Fonetičeskii stroi v'etnamskogo yazŷka*. Moscow: Nauka.
- Grenoble, Lenore A. 2003. *Language policy in the Soviet Union* (Language Policy 3). New York et al.: Kluwer Academic Publishers.
- Hall, Daniel Currie. 2011. [Phonological contrast and its phonetic enhancement: Dispersedness without dispersion](#). *Phonology* 28(1). 1–54.
- Halle, Morris. 1959. *The sound pattern of Russian: A linguistic and acoustical investigation*. 's Gravenhage: Mouton.
- Halle, Morris. 1963a. O pravilakh russkogo sprjazheniya (predvaritel'noe soobshchenie). In *American contributions to the Fifth International Congress of Slavists, Sofia, September 1963*. Vol. 1: *Linguistic contributions*, 113–132. The Hague: Mouton.
- Halle, Morris. 1963b. Phonemics. In Thomas A. Sebeok (ed.), *Current trends in linguistics*. Vol. 1: *Soviet and East European linguistics*, 5–21. The Hague: Mouton.
- Hamilton, William S. 1980. *Introduction to Russian phonology and word structure*. Columbus, OH: Slavica Publishers.
- Hoenigswald, Henry M. 1965. *Language change and linguistic reconstruction*. Chicago: Phoenix Books.
- Iosad, Pavel, Maria Koptjevskaja-Tamm, Alexander Piperski & Dmitri Sitchinava. 2018. [Depth, brilliance, clarity: Andrey Anatolyevich Zaliznyak \(1935–2017\)](#). *Linguistic Typology* 22(1). 175–184.
- Itkin, Il'ya Borisovich. 2007. *Russkaya morfonologiya*. Moscow: Gnozis.
- Jakobson, Roman. 1929. *Remarques sur l'évolution phonologique du russe comparée à celle des autres langues slaves* (Travaux du Cercle linguistique de Prague 2). Prague: Jednota československých matematiků a fyziků. *Phonological studies*. 1962. *Selected writings*. Vol. 1. 's Gravenhage: Mouton, 1962.
- Jakobson, Roman. 1948. Russian conjugation. *Word* 4. 155–167.
- Kasatkin, Leonid Leonidovich. 1999. *Sovremennaya russkaya literaturnaya i dialekt'naya fonetika kak istočnik dlya istorii russkogo yazŷka*. Moscow: Nauka & Shkola 'JaRK'.
- Kasevich, Vadim Borisovich. 1983. *Fonologičeskie problemŷ obščego i vostočnogo yazŷkoznaniya*. Moscow: Nauka.
- Kasevich, Vadim Borisovich. 1985. *Morfonologiya*. Leningrad: Izdatel'stvo Leningradskogo universiteta.
- Kibrik, Aleksandr Evgen'evich. 1977. *Opŷt strukturnogo opisaniya archinskogo yazŷka*. Vol. 3: *Dinamičeskaya grammatika* (Publikatsii Otdeleniya strukturnoi i prikladnoi lingvistiki 13). Moscow: Izdatel'stvo Moskovskogo universiteta.
- Kibrik, Aleksandr Evgen'evich, Sandro Vasil'evich Kodzasov & Irina Anatol'evna Murav'eva. 2000. *Yazŷk i fol'klor alyutortsev*. Moscow: IMLI RAN & Nasledie.

- Kiparsky, Paul & Morris Halle. 1977. Towards a reconstruction of the Indo-European accent. In Larry M. Hyman (ed.), *Studies in stress and accent* (Southern California Occasional Papers in Linguistics 4), 209–238. Los Angeles, CA: Department of Linguistics, University of Southern California.
- Kortlandt, Frederik. 1972. *Modelling the phoneme: New trends in East European phonemic theory* (Janua Linguarum Series Major 68). The Hague & Paris: Mouton.
- Kubryakova, Elena Samuilovna & Yuriĭ Genrikhovich Pankrats. 1983. *Morfologiya v opisanii yazŷkov*. Moscow: Nauka.
- Kuznetsov, Petr Savvich. 1941. K voprosu o fonematičeskoĭ sisteme sovremennogo frantsuzskogo yazŷka. *Učenŷe zapiski Moskovskogo gorodskogo pedagogičeskogo instituta. Kafedra russkogo yazŷka* 5(1). 140–174. Reprinted in Aleksandr Aleksandrovich Reformatskiĭ (ed.). 1970. *Iz istorii otečestvennoĭ fonologii: Očerki, khrestomatiya*. Moscow: Nauka, 1970.
- Labov, William. 2010. *Principles of linguistic change*. Vol. 3: *Cognitive and cultural factors*. Oxford: Wiley-Blackwell.
- Lehfeldt, Werner. 2009. *Einführung in die morphologische Konzeption der slavischen Akzentologie*. 3rd expanded and revised edition, with an afterword by Willem Vermeer (Vorträge und Abhandlungen zur Slavistik 42). München: Otto Sagner Verlag.
- Liberman, Anatoly. 1984. *Germanic accentology*. Vol. 1. Minneapolis: University of Minnesota Press.
- Lightner, Theodore M. 1965. *Segmental phonology of Modern Standard Russian*. Cambridge, MA: Massachusetts Institute of Technology dissertation.
- Lightner, Theodore M. 1972. *Problems in the theory of phonology*. Vol. 1: *Russian phonology and Turkish phonology*. Edmonton: Linguistic Research.
- Martin, Terry. 2001. *The affirmative action empire: Nations and nationalism in the Soviet Union, 1923–1939*. Ithaca & London: Cornell University Press.
- Maslov, Yuriĭ Sergeevich. 1979. O tipologii cheredovaniĭ. In Ruben Ivanovich Avanesov (ed.), *Zvukovoĭ stroĭ yazŷka*, 195–201. Moscow: Nauka. Reprinted in *Izbrannŷe trudŷ. Aspektologiya. Obščee yazŷkoznanie*. 2004. Moscow: Yazŷki slavyanskoĭ kul'turŷ, 2004.
- Matthews, Peter Hugoe. 1974. *Morphology: An introduction to the theory of word-structure* (Cambridge Textbooks in Linguistics 1). London & New York: Cambridge University Press.
- Milivojević, Dragan D. 1970. *Current Russian phonemic theory, 1952–1962* (Janua Linguarum Series Minor 78). The Hague & Paris: Mouton.
- Nikolaeva, Tat'jana Mikhaĭlovna. 1977. *Frazovaya intonatsiya slavyanskikh yazŷkov*. Moscow: Nauka.
- Nikolaeva, Tat'jana Mikhaĭlovna. 1996. *Prosodiya Balkan: Slovo — vŷkazŷvanie — tekst*. Moscow: Indrik.
- Orlova, Varvara Georgievna (ed.). 1970. *Obrazovanie severnorusskogo narečiya i srednerusskikh govorov: Po materialam lingvističeskoĭ geografii*. Moscow: Nauka.
- Padgett, Jaye. 2001. Contrast dispersion and Russian palatalization. In Elizabeth V. Hume & Keith Johnson (eds.), *The role of speech perception in phonology*, 187–218. San Diego: Academic Press.
- Panov, Mikhail Viktorovich. 1967. *Russkaya fonetika*. Moscow: Prosveshchenie.
- Panov, Mikhail Viktorovich. 1990. *Istoriya russkogo literaturnogo proiznosheniya XVIII–XX vekov*. Moscow: Nauka.

- Plapp, Rosemary Kuhn. 1996. Russian /i/ and /i/ as underlying segments. *Journal of Slavic Linguistics* 4. 76–108.
- Polivanov, Evgenii Dmitrievich. 1915. Muzýkal'noe udarenie v govore Tokio. *Izvestiya Imperatorskoï akademii nauk, seriya VI* 9(15). 1617–1638.
- Polivanov, Evgenii Dmitrievich. 1924. Vokalizm severo-vostochnýkh yaponskikh govorov. *Doklady Rossiïskoï akademii nauk: Seriya V*. 105–108.
- Polivanov, Evgenii Dmitrievich. 1928. *Vvedenie v yazýkoznanie dlya vostokovednýkh vuzov*. Leningrad: Leningradskii vostochnyi institut imeni A. S. Enukidze.
- Polivanov, Evgenii Dmitrievich. 1968. Mutatsionnye izmeneniya v zvukovoï istorii yazýka. In Fedor Dmitrievich Ashnin (ed.), *Stat'i po obshchemu yazýkoznaniiu*, 90–113. Moscow: Nauka.
- Polivanov, Evgenii Dmitrievich. 1974. *Selected works: Articles on general linguistics*. Alekseï Alekseevich Leont'ev (ed.). Trans. from the Russian by Daniel Armstrong (Janua Linguarum Series Maior 72). The Hague & Paris: Mouton. Trans. of Fedor Dmitrievich Ashnin (ed.). 1968. *Stat'i po obshchemu yazýkoznaniiu*. Moscow: Nauka, 1968.
- Polivanova, Anna Konstantinovna. 2008. Printsipy postroeniya segmentnoï grammatiki. In *Obshchee i russkoe yazýkoznanie: Izbrannye raboty*, 210–303. Moscow: Rossiiskii gosudarstvennyi gumanitarnyi universitet.
- Popov, Mikhail Borisovich. 2004. *Problemy sinkhronicheskoi i diakhronicheskoi fonologii russkogo yazýka*. St Petersburg: Filologicheskii fakul'tet Sankt-Peterburgskogo gosudarstvennogo universiteta.
- Reformatskii, Aleksandr Aleksandrovich. 1955. O sootnoshenii fonetiki i grammatiki. In Viktor Vladimirovich Vinogradov, Nikolaï Aleksandrovich Baskakov & Nikolaï Semenovich Pospelov (eds.), *Voprosy grammaticheskogo stroya*, 92–112. Moscow: Izdatel'stvo Akademii Nauk SSSR. Reprinted in Aleksandr Aleksandrovich Reformatskii (ed.). 1970. *Iz istorii otechestvennoï fonologii: Ocherk, khrestomatiya*. Moscow: Nauka, 1970.
- Reformatskii, Aleksandr Aleksandrovich (ed.). 1970. *Iz istorii otechestvennoï fonologii: Ocherk, khrestomatiya*. Moscow: Nauka.
- Salmons, Joseph C. & Patrick Honeybone. 2015. Structuralist historical phonology: Systems in segmental change. In Patrick Honeybone & Joseph C. Salmons (eds.), *The Oxford handbook of historical phonology*, 32–46. Oxford: Oxford University Press.
- Sériot, Patrick. 2012. *Structure et totalité: Les origines intellectuelles du structuralisme en Europe centrale et orientale*. 2nd edn. Limoges: Lambert-Lucas. Trans. as *Structure and the whole*. 2014. *East, west and non-Darwinian biology in the origins of structural linguistics*. Trans. from the French by Amy Jacobs-Colas. Berlin: Mouton, 2014.
- Shaumyan, Sebast'yan Konstantinovich. 1952. Problema fonemý. *Izvestiya Akademii Nauk SSSR: Otdelenie literatury i yazýka* 11(4). 324–343.
- Shcherba, Lev Vladimirovich. 1912. *Russkie glasnnye v kachestvennom i kolichestvennom otnoshenii*. St Petersburg: Tipografiya Yu. N. Erlikh. Rpt. as *Russkie glasnnye v kachestvennom i kolichestvennom otnoshenii*. 1983. Ed. by Lev Rafailovich Zinder & Liya Vasil'evna Bondarko. Leningrad: Nauka, 1983.
- Shcherba, Lev Vladimirovich. 1937. *Fonetika frantsuzskogo yazýka: Ocherk frantsuzskogo proiznosheniya v sopostavlenii s russkim*. Moscow & Leningrad: Uchpedgiz.

- Shvedova, Nataliya Yul'yevna, Nina Davidovna Arutyunova, Aleksand Vladimirovich Bondarko, Valerii Vasil'evich Ivanov, Vladimir Vladimirovich Lopatin, Igor' Stepanovich Ulukhanov & Filipp Petrovich Filin (eds.). 1980. *Russkaya grammatika*. Moscow: Nauka.
- Slezkine, Yuri. 1996. N. Ia. Marr and the national origins of Soviet ethnogenetics. *Slavic Review* 55(4). 826–862.
- Spahr, Christopher. 2014. [A contrastive hierarchical account of positional neutralization](#). *The Linguistic Review* 31(3–4). 551–585.
- Stankiewicz, Edward. 1966. Slavic morphophonemics in its typological and diachronic aspects. In Thomas A. Sebeok (ed.), *Current trends in linguistics*. Vol. 3: *Theoretical foundations*, 495–520. The Hague: Mouton. Reprinted in *Studies in Slavic morphophonemics and accentology*. 1979 (Michigan Slavic Materials 16). Ann Arbor, MI: Michigan Slavic Publications, 1979.
- Steblin-Kamenskij, M. I. 1974. The Scandinavian consonant shift. *Arkiv för nordisk filologi* 89. 1–29.
- Steiner, Peter. 1995. [Russian formalism](#). In Raman Selden (ed.), *The Cambridge history of literary criticism*. Vol. 8: *From formalism to poststructuralism*, 11–30. Cambridge: Cambridge University Press.
- Stevens, Kenneth N. & Samuel Jay Keyser. 1989. Primary features and their enhancement in consonants. *Language* 65(1). 81–106.
- Sudnik, Tamara Mikhaïlovna. 1975. *Dialektŭ litovsko-slavyanskogo pogranič'ya: Očerki fonologičeskikh sistem*. Moscow: Nauka.
- Timberlake, Alan R. 2004. *A reference grammar of Russian*. Cambridge: Cambridge University Press.
- Tolstaya, Svetlana Mikhaïlovna. 1998. *Morfonologiya v strukture slavyanskikh yazŭkov*. Moscow: Indrik.
- Tomson, Aleksandr Ivanovich. 1905. *Foneticheskie étyudy*. Varshava: Tipografiya Varshavskogo uchebnogo okruga. Originally published in *Russkii filologičeskii vestnik*, vol. 2.
- Trubetzkoy, Nikolai S. 1934. *Das morphologische System der russischen Sprache* (Travaux du Cercle linguistique de Prague 5.2). Prague: Jednota československých matematiků a fyziků.
- Trubetzkoy, Nikolai S. 1939. *Grundzüge der Phonologie* (Travaux du Cercle linguistique de Prague 7). Prague: Le Cercle linguistique de Prague.
- Twaddell, W. Freeman. 1935. [On defining the phoneme](#) (Language Monographs 11). Baltimore: Waverly Press.
- Verbitskaya, Lyudmila Alekseevna. 1990. Osnovnyĕ chertyĕ sovremennoĭ rusškoĭ proiznositel'noĭ normŭ. *Russistik* 2(1). 8–17.
- Voronkova, G. V. & M. I. Steblin-Kamenskij. 1975. [The phoneme — a bundle of DF?](#) *Linguistics* 13(146). 73–90. Trans. of Galina Vasil'evna Voronkova & Mikhail Ivanovich Steblin-Kamenskii. 1970. Fonema — puchok RP? *Voprosŭ yazŭkoznaniya* 1970/6. 15–26.
- Vŭsotskiĭ, Sergeĭ Sergeevich, Mikhail Viktorovich Panov, Aleksandr Aleksandrovich Reformat-skii & Vladimir Nikolaevich Sidorov (eds.). 1971. *Razvitie fonetiki sovremennogo russskogo yazŭka*. Vol. 2: *Fonologičeskie podsistemŭ*. Moscow: Nauka.
- Worth, Dean S. 1970. On the morphophonemics of the Slavic verb. *Slavia* 39. 1–9.
- Worth, Dean S. 1972. Vowel-zero alternations in Russian derivation. *International Journal of Slavic Linguistics and Poetics* 11. 110–123.

- Yakovlev, Nikolai Feofanovich. 1928. Matematicheskaya formula postroeniya alfavita: Opyt prakticheskogo prilozheniya lingvisticheskoi teorii. *Kul'tura i pis'mennost' Vostoka* 1. 41–64. Reprinted in Aleksandr Aleksandrovich Reformatskiĭ (ed.). 1970. *Iz istorii otechestvennoi fonologii: Ocherk, khrestomatiya*. Moscow: Nauka, 1970.
- Zaliznyak, Andrei Anatolevich. 1967. *Russkoe imennoe slovoizmenenie*. Moscow: Nauka.
- Zaliznyak, Andrei Anatolevich. 1977. *Grammaticheskii slovar' russkogo yaz'ika*. Moscow: Russkii yaz'ik.
- Zaliznyak, Andrei Anatolevich. 1985. *Ot praslavyanskoĭ aktsentuatsii k russkoĭ*. Moscow: Nauka.
- Zinder, Lev Rafailovich. 1979. *Obshchaya fonetika*. 2nd edn. Moscow: Vysshaya shkola.