

Tore Nessel
(University of Tromsø)

Modeling Language Change in Cognitive Grammar: The *bereč'* Verb Class in Russian*

Ever since cognitive linguistics was born in California more than thirty years ago (Lakoff & Johnson 1980; Lakoff 1987; Langacker 1987 & 1991a), the framework has grown rapidly, and is now influential worldwide. However, even today some areas of study are underrepresented, among them phonology, morphology and language change. In this article, I show how the interaction of phonology and morphology in language change can be modeled in Cognitive Grammar, the variety of cognitive linguistics developed by Ronald W. Langacker (1987; 1991a; 1991b; 1999). It is argued that a non-modular model enables us to represent phonological and morphological factors in a uniform way, and thus provides a straightforward account of their interplay in language change.

The analysis I propose addresses ongoing change in the softening alternation of verbs like *bereč'* 'take care of', where forms like *berežët* and *beregët* compete in present-day Russian. Three stages of development are compared. It is argued that the attested development is a product of the tension between language internal and external factors. Phonemization of palatal plosives facilitates language change, while language external factors such as social prestige have the opposite effect. After a brief overview of the data in section 1, I explore three stages of development in sections 2 through 4, before the contribution of the paper is summarized in section 5.

* I would like to thank Laura A. Janda and participants in the Danish-Norwegian historical linguistics conference at Lysebu, Oslo, January 2008, for comments on earlier versions of this article. For extensive discussion of stem alternations in Russian verbs, the interested reader is referred to Nessel (2008). Any shortcomings in form or content are my sole responsibility.

1. The softening alternations in Russian verbs

The Russian verb system is notorious for its complex stem alternations. The root final consonant of many verbs displays softening in parts of the inflectional paradigm. For instance, [d] in *glodat* 'gnaw' alternates with [z], as shown by forms like the 3 sg present tense *gložet*.¹ This kind of softening, which may be referred to as "substitutive", is a combination of palatalization (in a broad sense) and lenition. In the [d]~[z] alternation, the postalveolar [z] is closer to the palate than [d], so we are dealing with palatalization. The plosive [d] alternates with the fricative [z], which "increases the permeability of the vocal tract to airflow" (Lass 1984, 177). For this reason, it is justified to use the term "lenition". In addition to the complications presented by substitutive softening, there is also a different type of alternation, which I shall refer to as "plain softening". By way of example consider *vesti* 'lead', where the root-final [d] in 1 sg present tense *vedu* alternates with the palatalized [dʲ] in 3 sg *vedet*.

What is the distribution of substitutive and plain softening? Simplifying somewhat, substitutive softening is characteristic of polysyllabic suffixed verbs (e.g. *glodat* 'gnaw', *pisat* 'write', *xodit* 'walk' and *kupit* 'buy'), while plain softening is attested in verbs with monosyllabic stems. Monosyllabic stems with plain softening are of two types. First, there are non-suffixed verbs like *vesti* 'lead', *nesti* 'carry' and *mesti* 'sweep', and second there are verbs with non-syllabic roots and the suffix /a/, e.g. *brat* 'take', *ždat* 'wait' and *vrat* 'tell lies'.

The topic of the present study is a systematic exception to the generalization that monosyllabic stems display plain softening. Monosyllabic stems with a velar consonant in root-final position involve a combination of substitutive and plain softening. The examples in Table 1 illustrate this. In *vesti* the dental /d/ alternates with the corresponding palatalized dental [dʲ], which is an example of plain softening. In *bereč'*, on the other hand, the root-final velar [g] alternates with [ʝ] in the imperative, while (some of) the present tense forms display an alternation between [g] and [z]. In other words, verbs of the *bereč'* class have plain softening in the imperative and substitutive softening in the present tense.²

¹ According to standard practice, examples in italics are in transliterated orthography, while square brackets are used for phonetic transcription and slashes for phonemic transcription. Notice that I employ the International Phonetic Alphabet. Palatalization is represented by a superscript ^ʲ. The palatal obstruents (the initial sounds in *kislyj* 'sour', *gibkij* 'flexible', *xitryj* 'cunning') are transcribed as [c, ʝ, ç], not as [k', g', x'].

² Notice that I treat *bereč'* as a verb with a monosyllabic stem, because words with so-called pleophony (/er¹e, oro, olo/) morphologically behave like monosyllabic stems.

		<i>vesti</i> ‘lead’	<i>bereč</i> ’ ‘take care of’
Present	1 sg	vʲid+ú	bʲirʲig+ú
	2 sg	vʲidʲ+ósʲ	bʲirʲizʲ+ósʲ
	3 sg	vʲidʲ+ót	bʲirʲizʲ+ót
	1 pl	vʲidʲ+óm	bʲirʲizʲ+óm
	2 pl	vʲidʲ+ótʲi	bʲirʲizʲ+ótʲi
	3 pl	vʲid+út	bʲirʲig+út
	gerund	vʲidʲ+á	bʲirʲizʲ+á
Imperative	2 sg	vʲidʲ+í	bʲirʲij+í
	2 pl	vʲidʲ+ítʲi	bʲirʲij+ítʲi

Table 1: The present tense and imperative of *vesti* ‘lead’ and *bereč*’ ‘take care of’ (broad phonetic transcription)

Let me point out that the alternations in the *bereč*’ class given in Table 1 are characteristic of a somewhat conservative version of Contemporary Standard Russian. We shall return to the ongoing changes that are attested today, but first we must describe the distribution in the conservative variety more precisely. As shown in Table 1, the *bereč*’ class displays substitutive softening in the present tense forms where the ending starts with either /o/ or /a/. This is hardly a coincidence. In conservative Contemporary Standard Russian, the palatal obstruents [c, ʃ, ç] are not attested before /o/ or /a/ (see e.g. Timberlake 2004, 59–60 for discussion). In other words, plain softening would have created phonetically ill-formed strings of *[co], *[ca], *[ʃo] or *[ʃa]. It seems that substitutive softening occurs exactly where plain softening would have produced ill-formed words. The question arises as to whether and how this generalization can be accommodated in Cognitive Grammar. This is the topic of the following section.

2. Conservative contemporary standard Russian

In cognitive linguistics, the grammar of a language is not modeled as a set of transformational rules or a set of ranked constraints, but rather as a network of schemas that represent generalizations over structures that are attested in actual utterances (Langacker 1987, 53–54). Unlike traditional generative phonology (e.g. Chomsky & Halle 1968), there are no abstract underlying representations. Unlike Optimality Theory (Prince & Smolensky 2004/1993), there are no negatively specified constraints. Figure 1 provides two networks, one for the phoneme /z/ and one for /g/.³ The boxes at the bottom represent words that contain the sounds [z], [ʃ] and [g] (given in a broad phonetic transcription). As can be seen from the network to the left, [z] is

³ The examples in the figure are *žit* ‘live’, *žemčug* ‘pearls’, *žaba* ‘toad’, *žěltyj* ‘yellow’, *žuk* ‘beetle’, *gibel* ‘death’, *genij* ‘genius’, *gadost* ‘filth’, *god* ‘year’, and *gus* ‘goose’.

attested both before front and back vowels. In traditional terminology, we are dealing with a phoneme, since the quality of the consonant cannot be predicted from the quality of the following vowel. In Figure 1, we capture this generalization by means of the schema at the top left, which states that this sound is not limited by any context. The solid arrows indicate that all the words at the bottom instantiate the phoneme /z/.

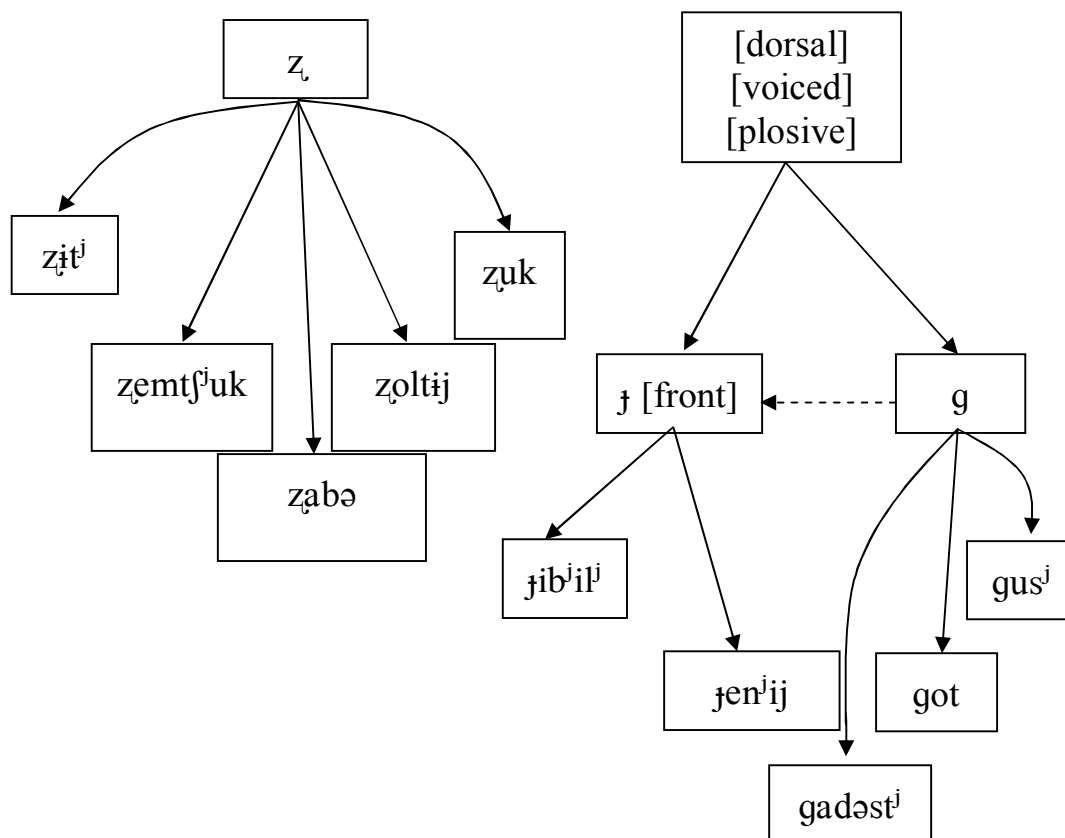


Figure 1: Phonemes as networks of schemas

The network to the right in Figure 1 concerns the phoneme /g/. As shown, [ɟ] is attested before the front vowels [i, e], whereas [g] is attested before other vowels. I capture the generalization that [ɟ] occurs before front vowels in the schema to the left in the mid row. In traditional terminology, [ɟ] is an allophone of the /g/ phoneme since [ɟ] and [g] are in complementary distribution. In the figure, I have not specified the phonetic contexts where [g] occurs. The dashed arrow indicates that [g] is the basic allophone, and I have not specified the phonetic context for this allophone. I will not discuss these assumptions, since they have no bearing on my argument. (Justifications and discussion of these designations can be found in Nessel 2008.) The topmost schema in the network to the right contains the feature shared by [ɟ] and [g]. In traditional terminology, this schema represents an archiphoneme.

Figure 2 contains the allophone schema for [ɟ] followed by a front vowel, as well as the context-free schema for the phoneme /z/. In addition, there are

two more complex schemas concerning the softening alternations in Russian verb stems. These morphological schemas consist of two parts. The lower part represents past tense forms. Characteristic for past tense forms like *beregla* ‘she took care of’ and *nesla* ‘she carried’ is a consonant-final stem followed by a consonant-initial ending. The sequence “C+C” represents this generalization. The upper part of the morphological schemas accounts for non-past forms which have vowel-initial endings preceded by a consonant (here illustrated by the 3 sg form). The morphological schema to the left accommodates plain softening (represented as C^j). For convenience, I use C^S to represent substitutive softening in the morphological schema to the right. Dashed arrows connect the boxes of the morphological schemas, indicating that past tense and non-past forms are closely related.

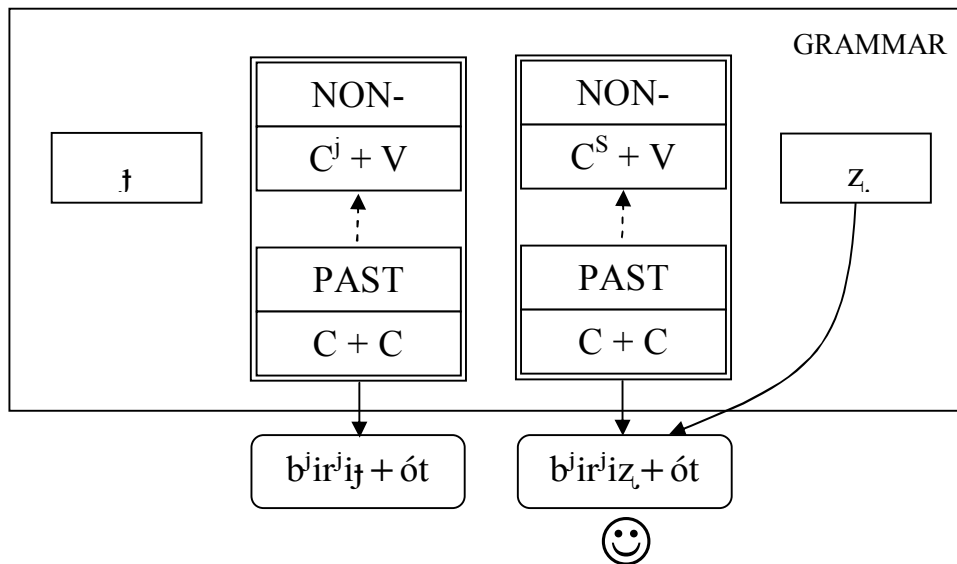


Figure 2: Schema interaction in conservative Contemporary Standard Russian

How do the schemas interact? Figure 2 is an attempt at modeling a speaker’s choice between the two potential present tense forms *beregēt* and *berežēt*. These forms are given in boxes with rounded corners. We may refer to them as “candidates”, because they are outside the grammar. The idea I pursue is that speakers compare the candidates to the relevant portions of the grammar and select the candidate that displays the highest degree of conceptual overlap with the grammar. Figure 2 illustrates this. Since the leftmost candidate has plain softening, this candidate is compatible with the morphological schema for plain softening. However, the leftmost candidate does not instantiate the allophone schema for [j], since the candidate’s ending does not begin with a front vowel. In other words, the leftmost candidate is only compatible with one schema in the grammar, namely the one that supports plain softening in non-past forms. The candidate to the left is not compatible with the j[front] schema, since the candidate does not combine [j] with a front vowel. The rightmost candidate, on the other hand, overlaps

with two schemas, viz. the morphological schema for substitutive softening and the phoneme schema for /z/, which indicates that [z] can occur before both front and back vowels. We can conclude that the rightmost candidate shows the highest degree of conceptual overlap with the grammar. We therefore correctly predict this candidate to be chosen by the speakers. For the convenience of the reader, the successful candidate is supplied with a smiley.

Before we leave Figure 2, a theoretical remark is in order. Generative linguistics assumes a modular conception of grammar. In the generative framework, phonology, morphology, syntax and semantics constitute largely independent subsystems (“modules”) with very limited interaction. Cognitive Grammar, on the other hand, is a non-modular framework, where a grammar is a network of schemas that may include phonological, morphological, syntactic and semantic information. There are arguments from neuroscience for a non-modular approach to grammar. For example, Feldman (2006, 8–9) refers to the division of grammar into autonomous modules like phonology, morphology, syntax and semantics as “artificial”, and states that it “makes no biological sense to talk about an autonomous module for grammar or any other capability” (Feldman 2006, 282). An assessment of Feldman’s argument is beyond the scope of this study. However, the Russian softening alternation illustrates the practical advantages of a non-modular framework for the working grammarian. As shown in Figure 2, allophonic, phonemic and morphological schemas interact directly, which enables us to give a straightforward account of softening in Russian conjugation.

3. “Progressive” contemporary standard Russian

What happens if the grammar represented in Figures 1 and 2 changes? As mentioned in section 1, the data we have considered so far represent a somewhat conservative variety of Contemporary Standard Russian, so this is not merely a theoretical question. As is well known, the Russian palatal obstruents are in the process of becoming phonemes (Flier 1982; Timberlake 2004, 59–60). Russian has borrowed numerous words with palatal obstruents before non-front vowels, e.g. *kjuvet* ‘ditch’ and *gjaur* ‘giaour’. Combinations of palatal obstruents and non-front vowels furthermore occur as a result of the addition of productive suffixes like *-or* and *-onok* as witnessed in examples like *kioskër* ‘stall-holder’, *panikër* ‘panic-monger’ and *makakënok* ‘offspring of macaque’ (Flier 1982, 142). On the basis of such examples it is possible that (some) language users consider palatal obstruents before non-front vowels permissible, and accordingly have context-free phoneme schemas for palatal obstruents in their mental grammars. How would such a grammar treat the verbs like *bereč'*? Figure 3 provides the answer. This figure concerns the same candidates as Figure 2. Furthermore, the grammar fragments in the two figures are identical with the one important exception

that the schema for the combination [ʃ] plus a front vowel has been replaced by a more general, context-free schema reflecting the phonemization of the palatal obstruents. As a consequence of this, the candidate to the left now overlaps with two schemas in the grammar – the same number of schemas that the rightmost candidate instantiates. We therefore end up with a situation where two candidates tie. I represent this by means of two smiling faces.

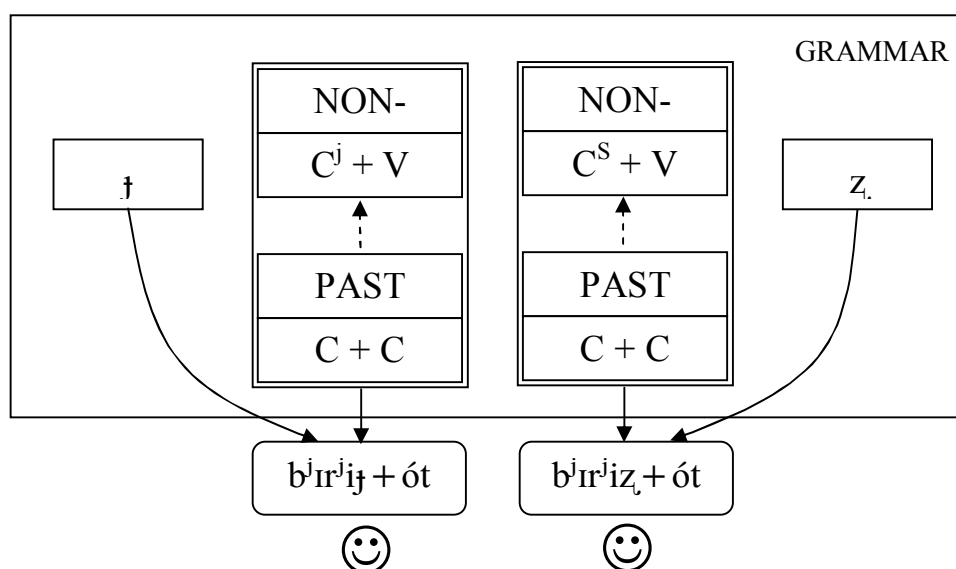


Figure 3: Schema interaction in “progressive” Contemporary Standard Russian

Since we have two winning candidates in Figure 3, we expect vacillation. This prediction is borne out by the facts. In a large sociolinguistic investigation reported on in Krysin (ed.) (1974, 214–215), palatal obstruents were used by almost half the informants in the present tense forms of *žeč'* ‘burn’, while about a quarter of the speakers used palatal obstruents in the present tense of *voloč'* ‘drag’. However, substitutive softening is still normative in these forms; the only velar verb where the use of palatal obstruents in the relevant present tense forms is normative is *tkat'* ‘weave’, cf. e.g. [tc + ot] ‘(s/he) weaves’. Possibly, the corroboration of the plain softening alternation in *tkat'* may have been supported by a prototypicality expectation that Russian verb stems must have a minimum of two segments. Applied to *tkat'*, the transitive softening alternation would yield the stem [tʲʲ] or [tʲʲ]. It seems that Russian verb stems must minimally contain two different segments, e.g. [lg] in *lgu* ‘(I) lie’. This prototypicality expectation is arguably not met in a stem consisting of only one affricate.⁴ The prototypicality expectation may furthermore explain why so many informants preferred forms like [zʲ + ot]

⁴ Henning Andersen (personal communication) reminds me that in Ukrainian the cognate of Russian *ткаць* has substitutive softening in the present tense. Ukrainian therefore seems to have a different prototypicality exception for verb stems than Russian.

with the plain softening alternation instead of [ʒʲ: + ot] with the transitive alternation for *žec'* 'burn' in the investigation mentioned above. Be that as it may; it seems clear that the situation in present-day Russian involves variation – as predicted by the analysis presented in Figure 3.

4. Further development: dialects

Situations involving variation are often unstable, and it is far from easy to predict the further development, especially since it partly depends on extralinguistic factors like social prestige. In linguistic communities like Russia, where the conservative norms of the standard language enjoy high social prestige, linguistic change may be slowed down or even reversed. However, there are language-internal factors that may support the further corroboration of the plain softening alternation in verbs of the *bereč'* class. First of all, this would simplify the paradigm of these verbs. After all, verbs with only the plain softening alternation are less complex than verbs with both plain and substitutive softening. Second, removing substitutive softening from verbs of the *bereč'* class would make these verbs more similar to verbs like *vesti* and *ždat'*, which display plain softening only. On the basis of the analysis I have outlined, it therefore does not come as a surprise that dialects with palatal obstruents in the present tense forms like *beregët* are well attested in Russian (cf. e.g. Kasatkin 2005, 146 and Požarickaja 1997, 99). I would like to consider three predictions of the analysis I have presented above for Russian dialects.

The first prediction concerns the interplay of language external and internal factors. I have argued that language internal factors favor forms like *beregët*, while language external factors such as social prestige may represent a counterforce. This analysis leads us to expect that plain softening will be more widespread in varieties of Russian that are less influenced by the norms of the standard language. This prediction is borne out by the facts; forms like *beregët* are the widespread in Russian dialects, i.e. in varieties of Russian that reflect non-normative speech.

The second prediction is that the status of palatal obstruents as phonemes should be stronger in varieties of Russian where verb forms with plain softening (e.g. *beregët*) are widespread. This prediction is also borne out by the facts. In addition to the processes that facilitate phonemization of palatal obstruents in standard Russian, progressive softening assimilation further corroborates the phoneme status of these sounds in Russian dialects. As a consequence of progressive softening assimilation, words like the hypocoristic names *Van'ka* and *Marus'ka* are pronounced with the palatal [c], not the velar [k] as a result of the influence of the preceding soft consonant (Kasatkin 2005, 78). According to Kasatkin (2005, 58), the soft [c] has spread even to contexts where it is preceded by a *hard* consonant. Thus, in many dialects the hypocoristic *Ninka* display the soft [c], although the preceding

consonant is hard. Since the presence of palatal obstruents is not predictable from the phonetic environment, these sounds are clearly phonemic.

Let us now turn to the third prediction from the analysis I have proposed. In section 1, it was argued that in conservative Contemporary Standard Russian plain softening is blocked in forms where it would create phonotactically ill-formed sequences of palatal obstruents before /o, a/. It follows from this analysis that if the relevant verbs forms contained *front* vowels instead of /o, a/, we would expect plain softening to occur, because the phonotactic problem would not arise. Interestingly, Russian dialects enable us to test this prediction. Many Russian dialects have the present tense endings /eʂ, et, em, etʲe/ instead of the endings /oʂ, ot, om, otʲe/ of the standard language. According to *Dialektologičeskij Atlas Russkogo Jazyka* (volume 2, map 82), /e/-initial endings are attested in the western part of the southern macro-dialect (narečie). The area with /e/-initial endings extends as far east as the river Don, but such endings are not found in a triangle-shaped area around Kaluga, Orel and Tula south of Moscow. Plain softening in the *bereč'* class occurs in the southern macro-dialect too, and is attested in middle Russian dialects as well. However, it is worth mention that plain softening is not found in a small area near Kaluga and Tula (*Dialektologičeskij Atlas Russkogo Jazyka*, volume 2, map 94). Although the geographical areas of /e/-initial endings and plain softening in the *bereč'* class do not coincide completely, there is considerable overlap, thus lending support to the idea that phonotactics is relevant for the distribution of plain and substitutive softening in the *bereč'* class.

5. Concluding remarks

Discussing ongoing change in Russian verbs, I have identified three stages of development and argued that the instability in present-day Russian is due to the tension between language internal and external factors. While the ongoing phonemization of palatal obstruents favors plain softening, language external factors such as social prestige may inhibit language change. However, the implications of the proposed analysis go beyond Russian linguistics. We have seen that phonotactic changes have a direct impact on morphology, and that the interaction of phonology and morphology in language change can be accommodated in a non-modular framework such as Cognitive Grammar.

Author's email address: nessel@hum.uit.no

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