Diachronic Slavonic Syntax

Gradual Changes in Focus

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PREDICATE AGREEMENT IN RUSSIAN: A CORPUS-BASED APPROACH*

Summary

The paper addresses the evolution of predicate agreement in Russian over the last two centuries. Analysis of a large corpus of literary works from the 19th and 20th centuries reveals two diachronic patterns, one involving the gradual generalization of an innovative form while the other type, which is less common, involves undulating variation with no observable historical trend. We analyze the conditions that underlie both types of diachronic behavior and show that although conditions which disfavour certain morphosyntactic variants need not preclude historical change, the course of a diachronic process may be suspended if it is in serious conflict with other morphosyntactic mechanisms.

1. Introduction

In Russian, the predicate agrees with the subject in number (as well as gender, though this will be irrelevant in the following discussion):

(1a)	*Stol*	***stojal***	*v*	*uglu.*	(1b)	*Stol-y*	***stojal-i***	*v*	*uglu.*
	table	**stood**	in	corner		table	**stood-PL**	in	corner
	(M)[SG]	**[SG.MASC]**				[(M)PL]			
	'The table was in the corner.'					'The tables were in the corner.'			

There are two types of construction however which allow alternative patterns of predicate agreement: conjoined noun phrases as in (2) and quantified expressions, as in (3).

(2a)	*V*	*uglu*	***stojal***	*stol*	*i*	*kres-lo.*
	in	corner	**[SG.MASC]**	table(M)[SG]	and	arm-chair-(N)[SG]
	'There were a table and an arm-chair in the corner.'					

(2b)	*Cholod*	*i*	*strach*	***dovodil-i***	*menja*	*do*	*istuplenija.*
	cold(M)[SG]	and	terror(M)[SG]	**drove-PL**	me	to	madness
	'Cold and terror drove me mad.'						

(3a)	*U*	*menja*	*zavtra*	***obeda-et***	*čelovek*	*desjat'*	*prijatel-ej*
	by	me	tomorrow	**dine-3SG**	person[PL.GEN]	ten	friend-PL.GEN
	'About ten of my friends are coming to my place for dinner tomorrow.'						

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(3b) *Na* *sredine* *zaliv-a* ***barachtal-i-s'*** *dva* *čelovek-a*
on middle bay-SG.GEN **splashed-PL.REFL** two person-SG.GEN
'Two people were splashing about in the middle of the bay.'

Singular forms of the predicate in (2a) and (3a) are based on formal (syntactic) agreement. In (2a) singular results from agreement with the first conjunct[1]. In (3a) it results from the agreement with the numeral *desjat* 'ten'. Numerals in Russian that are not marked for number trigger a default agreement form of the predicate, which is singular neuter. In (2b) and (3b) the plural is assigned semantically: the subject denotes more than one individual, in which case plural (semantic) predicate agreement is possible.

Up to the 18th century, singular agreement was much more common both with conjoined noun phrases and with quantified expressions: according to Borkovskij (1978: 30-40) in 11th-17th century Russian all inanimate subjects and postverbal animate subjects controlled singular predicates; the plural was common with preverbal animate subjects. By the beginning of the 19th century the situation had become less clear-cut. As our data indicate, by that time plural agreement had become common with both construction types (Table 1).

	S-P animate		S-P inanimate		P-S animate		P-S inanimate	
	% pl	total	% pl	total	% pl	total	% pl	total
Conjoined NP	99	194	92	276	64	25	19	74
Quantified expressions	92	86	92	83	86	65	82	79

Table 1. Frequency of plural predicate agreement with respect to animacy and word order (subject-predicate or predicate-subject) in the first half of the 19th century

From the beginning of the 19th century until the turn of the millenium (1801-2000) there are remarkable differences between the two types of subject: while conjoined noun phrases tend to generalize plural agreement (Figure 1), quantified expressions show no historical trend and maintain the same proportion of alternative forms in both the early 19th and late 20th century, despite dramatic wavering in-between (Figure 2).

[1] The predicate typically agrees with the nearest conjunct, as in (2a), where we can see this from the gender marking on the verb. Agreement with other conjuncts is extremely rare (see Timberlake 2004: 354-355). A choice therefore is only possible when the nearest conjunct is in the singular, and only such conjuncts are considered here (a plural conjunct would obligatory trigger the plural on the predicate). For the purpose of this study we restricted the sample to the most frequent type of conjoined NPs, namely to constructions with two NPs and connective conjunctions *i* 'and' , *i....i* 'both..... and'.

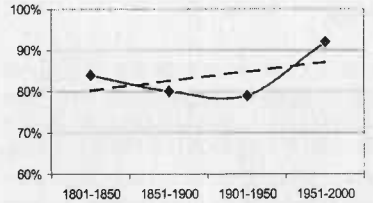

Figure 1. Plural predicate agreement with conjoined noun phrases. The dashed trendline shows the overall increase in plural agreement over the period between 1801 and 2000. Chi-squared test indicates that the trend is statistically very significant (p= 0.001).

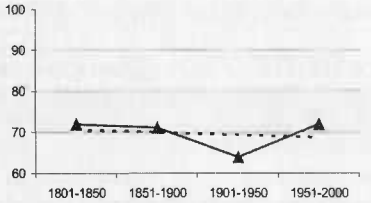

Figure 2. Plural predicate agreement with quantified expressions. The dashed trendline reveals no change in plural agreement over the period between 1801 and 2000. Chi-squared test confirmed this with p=0.97).

It is striking that the variation in predicate agreement which led to the generalization of one pattern with conjoined subjects did not lead to a unified agreement rule for quantified expressions. To understand why, we will analyse the factors which contributed to variation in predicate agreement within four successive 50-year periods between 1801 and 2000. We will show that despite a strong tendency to generalize plural agreement with some subject types, there are factors that significantly hamper this generalization with other types, resulting in different patterns.

2. Data and methodology

The data for this study have been drawn from the database of short term morphosyntactic change developed by the Surrey Morphology Group in 2004-2008 (http://www.surrey.ac.uk/LIS/SMG/STMC). The statistics have been derived from a corpus of Russian literary texts written between 1801 and 2000. A total sample of ten million words have been analysed. The data were divided into smaller samples according to four successive 50-year time periods and split further with respect to individual factors contributing to the variation in predicate agreement. To test the observations based on frequencies of competing forms, two statistical tests were used: a chi-squared test for frequency distribution which allowed us to evaluate whether particular sub-samples differ with respect to distribution of alternative choices, and a chi-squared trend test, which allowed us to determine whether the differences across sub-samples from different time periods indicate a historical trend. Statistical significance is reported at the 5% level, i. e. the null hypothesis of no difference between sub-samples or no historical trend is rejected if p-value ≤ 0.05.

3. Predicate agreement with conjoined noun phrases

As Corbett (1983, 2006) has shown, two major factors that condition variation in predicate agreement with conjoined noun phrases are animacy and precedence (word order). These two factors affect the variation in the following way: animate conjuncts have stronger preference for plural agreement than inanimate ones, and subject-predicate word order favours plural more than predicate-subject word order. When both favourable conditions occur, the percentage of plural agreement will be the highest; if only one of these conditions occurs, the frequency of plural agreement decreases to the same extent; the lowest frequency of plural predicates is found when neither of these two conditions occur (Corbett 1983: 151-153).

To investigate the effect of these two factors from a diachronic perspective we have plotted four trajectories for each possible combination of conditioning factors (Figure 3). Corresponding statistics are summarized in Table 2. The chart shows that in the early 19th century, plural agreement predominated in all sentences with subject-predicate word order, with only a slight significant difference between animate and inanimate conjuncts (99% and 93% of plural predicates respectively).[2] These two types contrast with predicate-subject constructions, which allow for significant variation in agreement. The frequency of plural agreement here is again correlated with animacy, but the margin between the two groups is significantly larger: with inanimate conjuncts we find the lowest percentage of plural agreement (14%), while animate conjoined subjects, if they occur preverbally, take plural agreement in 62% of the sentences. So word order is the crucial factor in this period: sentences with subject-predicate word order almost always favoured plural agreement; significantly behind are sentences with predicate-subject word order, in which frequencies for plural agreement vary dramatically with respect to animacy.

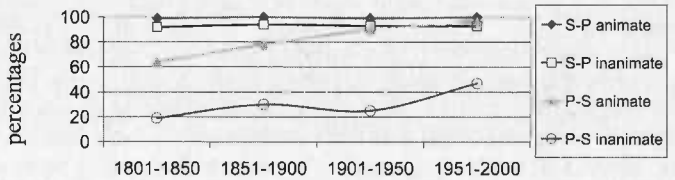

Figure 3. Plural predicate agreement with conjoined noun phrases with respect to animacy and word order.

[2] This difference however turned out to be statistically significant (p-value for frequency distribution across the two groups is 0.0024), which indicates that animates are still ahead of inanimates and that the hierarchy of conditioning factors holds even despite very high frequencies for plural agreement with both types of controllers.

	1801-1850	1851-1900	1901-1950	1951-2000	Chi-squared trend test
S-P animate SG	2	1	1	1	Not applicable[3].
S-P animate PL	192	204	127	247	
S-P animate % PL	99	100	99	100	
S-P inanimate SG	21	9	4	5	p=0.999
S-P inanimate PL	255	133	55	68	
S-P inanimate % PL	92	94	93	93	
P-S animate SG	9	12	3	2	p < 0.0005
P-S animate PL	16	42	28	48	
P-S animate % PL	64	78	90	96	
P-S inanimate SG	60	78	51	26	p < 0.0005
P-S inanimate PL	14	34	17	23	
P-S inanimate % PL	19	30	25	47	

Table 2. Underlying numbers, percentages and trend tests results for predicate agreement with conjoined noun phrases according to animacy and word order.

In succeeding periods, sentences with preverbal subjects unsurprisingly show no change, preserving the same high frequency of plural agreement. At the same time, dramatic changes occur in sentences with predicate-subject word order, which show a steady increase in plural agreement. As a result, individual subclasses of controllers (noun phrases) converge in the way they control agreement; thus the frequency of plural agreement with postverbal animate subjects increased from 64% in the 1801-1850 time period to 96% in 1951-2000. Chi-squared test performed on this group of sentences revealed a highly significant upward trend, with a p-value less than 0.005. Therefore, in the second half of the 20th century the presence of at least one of the favouring conditions, either subject-predicate word order or animate conjuncts, guaranteed the predominance of plural agreement. Restrictions on plural agreement also weakened with the fourth type of controller, inanimate conjuncts following the predicate (58% in the 1951-2000 against 14% in 1801-1850). Chi-squared test has confirmed the presence of a statistically significant change in predicate agreement in such sentences (p-value < 0.005).

Statistics for the four types of sentences concur that the development of predicate agreement with conjoined noun phrases presents a well-behaved instance of historical change according to an S-shaped curve (Kroch 1989: 199-244; 2001: 699-729). Different slopes indicate different degrees in the advancement of the change.

4. Predicate agreement with QE: variation without change

Such consistency in historical change, as discussed in the previous section, is not universal. Various functional effects may turn out to be strong enough to preclude the spread of the innovative form and the development of an S-shaped curve. Predicate agreement with quantified expressions in Russian over the last two centuries provides an example of just this behaviour: competition of morphosyntactic choices (singular vs. plural predicates) and dramatic fluctuations in the frequency of competing forms across

[3] Due to extreme rarity of singular predicates with animate subject nouns and subject-predicate word order, the chi-squared test could not be performed with any degree of validity. However, frequencies of plural predicates within the four periods under investigation (99%, 100%, 99% and 100%), as well as underlying numbers, do not suggest any change.

different time periods do not necessarily lead to any overall historical change (Figure 2). The question arises as to why the language shows no tendency to generalize one of the alternatives and to eliminate optionality in predicate agreement with quantified expressions, as opposed to predicate agreement with conjoined noun phrases.

Historical accounts of this phenomenon are very contradictory. While some authors claim that the preference for plural agreement increases over time (e.g., Rozental' 1978), others (Mullen 1967, Suprun 1969, Patton 1969, Corbett 1983) argue that there is no evidence for the general rise of plural. Where change takes place, it may have a different shape under different conditions. Thus Suprun (1969) claims that plural agreement decreased from 19th to 20th century with all quantified expressions except those with *neskol'ko* 'a few' which show a slight increase. Patton (1969) argues that while the frequency of plural agreement increased over the last two centuries with inanimate nouns, the proportion of singular and plural predicates with animate nouns did not change during that time. In other words, given that animates have a larger percentage of plural agreement than inanimates, the gap between the two types of controllers reduced from the 19th to the 20th century.

The lack of consensus between different studies is striking not only because they propose different tendencies in the development of predicate agreement with quantified expressions, but also because different factors are claimed to play a leading role in this process. To account for the diachronic process observed with quantified expressions we have extracted statistics for four 50-year periods and then split the corpus with respect to conditioning factors so that the effect of each factor could be traced in combination with other factors.

As with conjoined noun phrases, predicate agreement with quantified expressions is conditioned by animacy and precedence. That is, animate subjects and subject-predicate word order favour plural predicates, while predicate-subject word order and inanimates favour singular. Taken in different combination, these conditions result in different frequencies for each of the morphosyntactic choices (Graudina/Ickovič/Katlinskaja 1976: 28-30, Corbett 1983: 151-153, Timberlake 2004: 354). We will analyse these conditions in connection with a third factor, the type of quantifier, which has a crucial effect on the variation in predicate agreement with quantified expressions. It has been demonstrated in a number of studies (e. g., Suprun 1957, Corbett 1983) that the difference in syntactic properties of quantifiers, i.e. between the numerals *dva* 'two', *tri* 'three', *četyre* 'four' on the one hand, and quantifiers *pjat'* 'five' and above on the other, account for significant differences in predicate agreement with quantified expressions: the first group has a strong preference for plural agreement while the second allows for variation in number agreement.

4.1. Quantified expressions with *dva* 'two', *tri* 'three', *četyre* 'four'

The analysis of the sample including quantified expressions with the numerals *dva* 'two', *tri* 'three' and *četyre* 'four' shows that plural agreement predominated with both animate and inanimate subjects, and with both types of word order (subject-predicate and predicate-subject) as early as at the turn of the 19th century. This situation holds over the two centuries (Figure 4).

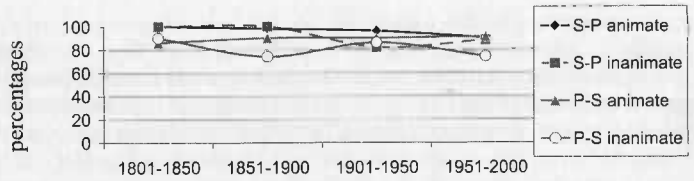

Figure 4. Plural predicate agreement with quantified expressions with respect to animacy and word order

	1801-1850	1851-1900	1901-1950	1951-2000	Chi-squared trend test	Chi-squared test for frequency distribution
S-P animate SG	0	1	1	4	Not applicable[4]	Not applicable[4]
S-P animate PL	35	45	27	38		
S-P animate % PL	100	98	96	90		
S-P inanimate SG	0	0	8	5	Not applicable[4]	Not applicable[4]
S-P inanimate PL	26	32	37	38		
S-P inanimate % PL	100%	100%	82%	88%		
P-S animate SG	3	5	3	5	p=0.136	p=0.955
P-S animate PL	19	44	26	49		
P-S animate % PL	86%	90%	90%	91%		
P-S inanimate SG	3	12	7	19	p=0.232	p=0.178
P-S inanimate PL	26	35	42	55		
P-S inanimate % PL	90%	74%	86%	74%		

Table 3. Underlying numbers, percentages, trend test and test for frequency distribution results for predicate agreement with quantified expressions containing low numerals.

As data in Table 3 show, the null hypothesis that there is no historical trend is confirmed by a chi-squared trend test for sub-samples with predicate-subject word order. In sub-samples with subject-predicate word order the percentage of plurals attained a very high level in all four time periods, however the rarity of singular forms in these sub-samples invalidated the use of both chi-square tests. Where the groups diverge (as in 1851-1900 and 1951-2000), we find animacy and/or precedence factors at work even at this late stage of morphosyntactic change: in the presence of at least one factor favouring plural agreement (animate noun and/or subject-predicate word order) plural is very frequent, while the group with no such factor (i. e. with the inanimate preverbal subject) is left behind (Figure 4). In sum, quantified expressions with numerals *dva*, *tri*, *četyre* show an overall preference for plural predicate agreement across the two centuries with both types of subject and both types of word order. The frequency for plural agreement is very high, and all four groups of controllers are very close to each other in how they affect agreement. The impact of animacy and word order on variation is minimal. However where we do find an impact, we find animacy and precedence at work.

[4] Results of a chi-squared test are not reliable if the number of instances in one of the sub-groups is very low or equal to zero.

4.2. Quantified expressions with quantifiers *pjat'* 'five' and above

The group of quantified expressions consisting of the numerals *pjat'* 'five' and above, along with some non-numerical quantifiers (*neskol'ko* 'a few' *malo* 'few'), presents a remarkable contrast to quantified expression with lower numerals. As in the preceding sections, the sample has been split into four sub-samples with respect to animacy (animate and inanimate nouns) and word order (subject-predicate and predicate- subject). Figure 5 show changes in plural agreement in these four sub-samples.

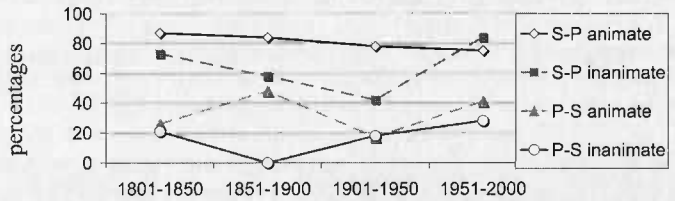

Figure 5. Plural predicate agreement with quantified expression containing numerals *pjat'* 'five' and above, and quantifiers *neskol'ko* 'a few' and *malo* 'few'

This group of quantified expressions, as Figure 5 indicates, is remarkably distinct from quantified expressions with *dva* 'two', *tri* 'three' and *četyre* 'four' in that they allow significant variation in agreement, conditioned by animacy and word order. In contrast to quantified expressions with lower numeral, quantified expressions with *pjat'* 'five' and above show dramatic fluctuations in the frequency of singular/plural predicates over the two centuries. The only sub-sample in which we do not find any statistically significant fluctuations is the one with preverbal animate nouns. In this sub-sample we find a very high proportion of plural predicates as early as in the first half of the 19th century, and this situation holds over the two centuries. Three other sub-samples present us with significant variation, confirmed by a chi-squared test for frequency distribution (Table 6): differences in the proportion of plurals across different periods have been found to be statistically significant in the sub-samples, shown by three lower trajectories on Figure 6. Differences across different time periods for a sub-sample containing sentences with preverbal animate subjects (the upper trajectory) were found to be not statistically significant.

	1801-1850	1851-1900	1901-1950	1951-2000	Chi-squared trend test	Chi-squared test for frequency distribution
S-P animate SG	7	6	8	9		
S-P animate PL	45	31	29	27	p=0.138	p=0.522
S-P animate % PL	87%	84%	78%	75%		
S-P inanimate SG	7	8	18	3		
S-P inanimate PL	19	11	13	16	p=0.892	p=0.013
S-P inanimate % PL	73%	58%	42%	84%		
P-S animate SG	28	32	29	26		
P-S animate PL	10	30	6	18	p=0.817	p=0.009
P-S animate % PL	26%	48%	17%	41%		
P-S inanimate SG	22	30	31	29		
P-S inanimate PL	6	0	7	11	p=0.189	p=0.025
P-S inanimate % PL	21%	0%	18%	28%		

Table 6. Underlying numbers, percentages, trend test and test for frequency distribution results for plural predicate agreement with quantified expressions containing numerals *pjat'* 'five' and above, and quantifiers *neskol'ko* 'a few' and *malo* 'few'

At the same time the analysis of the four time periods according to the frequency of plural agreement shows that the effect of animacy and precedence in general holds over the whole period under investigation (Figure 5). Their effect varies from one period to another, and may be significantly diminished as the two construction types converge (as for example animate and inanimate postverbal subjects in 1801-1850 and in 1901-1950). In the subsequent period, however, such groups move away from each other exactly in a way as may be predicted on the basis of these two hierarchies: animate subjects and subject-predicate word order show a stronger preference for plural predicates than inanimate subjects and predicate-subject word order (see, for example, animate and inanimate postverbal subjects in 1851-1900 and in 1951-2000). But despite remarkable fluctuations across different time periods and across different groups of controllers, none of these four groups show any obvious diachronic trend over the two centuries (Table 6).

5. Suspended change

In 19th and 20th century Russian, the preference for plural (semantic) agreement with conjoined noun phrases increased radically. This construction type has generalized plural predicate agreement completely in some contexts, and is in the process of generalizing it to others, concurrent with an S-shaped curve. Change with quantified expressions containing *dva* 'two', *tri* 'three', *četyre* 'four' has advanced even further. Against this background, quantified expressions with *pjat'* 'five' and above, plus the non-numerical quantifiers *neskol'ko* 'a few' and *malo* 'few', show an unusual diachronic pattern: the frequencies for competing forms rise and fall in most of the contexts, with no tendency to generalize one of the agreement patterns. Why does this type of controllers display such unusual diachronic behaviour? In our opinion, the answer is that, while such quantified expressions are *semantically* plural, their *syntactic* properties favour singular agreement.

The numerals *dva* 'two', *tri* 'three' and *četyre* 'four' have a number of unusual properties which set them apart as a distinct class. Syntactically, they show a mixture of adjectival properties (gender agreement with 'two') and nominal properties (case government); further, their case government behaviour is unique, in that they take the genitive singular of nouns, and either the nominative or genitive plural of adjectives. Morphologically, their nominative(-accusative) forms are not readily interpretable.

(4a) *četyr-e* ***jark-ie*** *sveč-i*
four- **bright-** candle-
NOM **NOM.PL** GEN.SG
'Four bright candles'.

(4b) *četyr-e* **jark-ich** *sveč-i*
four- **bright-** candle-
NOM **GEN.PL** GEN.SG
'Four bright candles'.

On the other hand, the quantifiers *pjat'* 'five' and above, and the quantifiers *neskol'ko* 'a few' and *malo* 'few', resemble nouns to a large extent. They do not show gender agreement, and they consistently govern the genitive (plural), both of nouns and adjectives.

(5) *Pjat'* *tuskl-ych* *lamp*
five[NOM] dim-GEN.PL bulb[GEN.PL]
'Five dim lamps illuminated the yard.'

Morphologically, they resemble singular nouns. Thus, the quantifier in these expressions resembles a noun with a genitive complement, and is liable to control agreement in the same way, namely syntactically.[5]

This difference between adjective-like and noun-like behaviour (Corbett 1993: 25, Halle 1994: 205) influences the spread of plural predicate agreement. In the case of the '2-4', the quantifier is not a canonical agreement controller, in as much as it is itself a potential agreement target (for gender). This allows semantic agreement to step in. But in the constructions with *pjat'* 'five' and above, *neskol'ko* 'a few' and *malo* 'few', the quantifier tends to behave like an ordinary noun phrase, as in (1) and (2), in which number agreement is controlled solely by the head. Consequently they resist and even, as we have seen, block the diachronic change that would diminish their ability to behave like noun phrases and to control predicate agreement. Prior to the 19th century plural agreement prevailed with preverbal animate subjects, i. e. in the most favourable conditions, but was suspended in other contexts (Table 5). As a result, in the 19th and 20th century we observe remarkable fluctuations with this group of controllers, which however do not produce any overall historical trend. This is not the case with lower numerals, whose more adjective-like properties provided more favourable conditions for the spread of plural agreement.

6. Conclusion

Russian predicate agreement over the last two centuries presents us with two remarkably distinct diachronic patterns. With subjects expressed by conjoined noun phrases and quantified expressions containing lower numerals we find the S-shaped spread of semantic (plural) predicate agreement, based on the meaning of the subject. Consequently mechanism which led one of the elements in such constructions (a conjunct or a numeral) to assign agreement on the predicate gradually deteriorated. This is not the case with quantified expressions containing higher numerals (*pjat'* 'five' and above) and other (non-numerical) quantifiers. The syntactic properties of such quantifiers, namely their ability to control the predicate and to assign singular agreement on it, blocked the spread of semantic agreement. With this latter construction type, we find striking variation in predicate agreement over the last two centuries, with significant fluctuations across individual time periods, without any clear historical trend.

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[5] The fact that agreement is singular may be due to these quantifiers' being construed as morphological singulars, or to their being construed as unspecified for number, with singular assigned by default.

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