"Grammatical Profiles: What Inflectional Forms Tell us about Lexicon and Grammar"
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Introduction
> What is a Grammatical Profile?
> Tense, Aspect and Mood in Russian

2 Studies of TAM in Russian
> Study 1: prefixes and suffixes
>> Are pairs formed via both prefixes and suffixes?
> Study 2: TAM and outlier verbs
>> What verbs are most attracted to TAM combinations?

Conclusion
> Perfective vs. imperfective pairs formed with prefixes and suffixes behave the same way
> Grammatical "idioms" in interaction of aspect and inflection

Grammatical Profile =
> Relative frequency distribution of the inflected forms of a word in a corpus

TAM in Russian
Tense: Past vs. Non-Past (imperfective = present, perfective = future)
Aspect: Imperfective vs. Perfective "paired" verbs (residue of biaspectuals)
Mood: Indicative, Infinitives in modal constructions, Imperative

Study 1: prefixes and suffixes

Major Patterns of aspectual morphology:
> Simplex verbs -- nearly all imperfective (*delat'* 'do')
> Prefixed verbs (prefix + simplex) -- nearly all perfective (*sdelat'* 'do', *peredelat'* 'redo')
> Prefixed and suffixed verbs (prefix + simplex + suffix) -- secondary imperfectives (*peredelyvat'* 'redo')

p-partners (Natural Perfectives): simplex & prefixed (*delat'* 'do' & *sdelat'* 'do')
s-partners (Specialized Perfectives): prefixed & prefixed and suffixed (*peredelat'* 'redo' & *peredelyvat'* 'redo')

Traditional Hypothesis: both p-partners and s-partners form aspectual pairs
Isačenko Hypothesis: only s-partners form aspectual pairs

	Imperfective				Perfective			
	Ipfv_ NonPast	Ipfv_ Past	Ipfv_ Inf	Ipfv_ Imper	Pfv_ NonPast	Pfv_ Past	Pfv_ Inf	Pfv_ Imper
both p- & s- partners	1,330,016 47.4%	915,374 32.6%	482,860 17.2%	75,717 2.7%	375,170 11.9%	1,972,287 62.7%	688,317 21.9%	111,509 3.5%

Table 1: Grammatical profiles of imperfective vs. perfective verbs

Statistically significant: chi-squared = 947756, df = 3, p-value < 2.2e-16
With nearly 6M datapoints, too much statistical power
Effect size moderate/large: Cramer's V = 0.399
 (0.1 = small, 0.3 = moderate, 0.5 = large)

In other words, imperfective verbs behave differently than perfective verbs.

	Ipfv_NonPast	Ipfv_Past	Ipfv_Inf	Ipfv_Imper	Pfv_NonPast	Pfv_Past	Pfv_Inf	Pfv_Imper
p-partners	475,893	397,409	195,926	36,427	72,439	317,570	114,460	24,280
	43%	35.9%	17.7%	3.3%	13.7%	60.1%	21.6%	4.6%
s-partners	854,123	517,965	286,934	39,290	302,731	1,654,717	573,857	87,229
	50.3%	30.5%	16.9%	2.3%	11.6%	63.2%	21.9%	3.3%

Table 2: Grammatical profiles of p-partners vs. s-partners

Imperfectives: chi-squared = 16155.13, df = 3, p-value < 2.2e-16, but Cramer's V = 0.076, **below "small"**
Perfectives: chi-squared = 4365.078, df = 3, p-value < 2.2e-16, but Cramer's V = 0.037, **below "small"**

In other words, p-partners do not behave differently from s-partners, not in terms of imperfectives, nor in terms of perfectives.
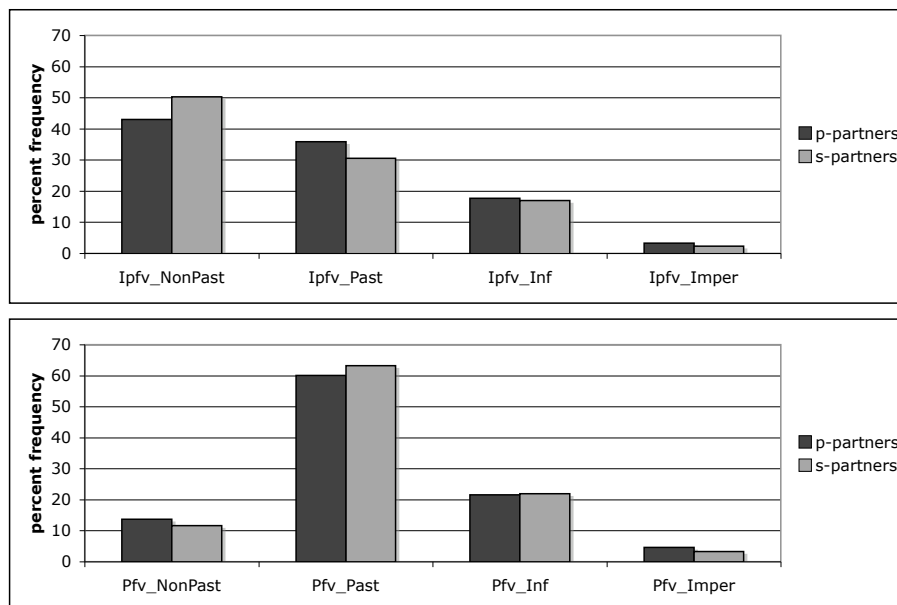

Figure 1: Distribution of of p-partner (dark grey) and s-partner (light grey) forms

Study 2: outlier verbs

Imperfective imperative "be doing X!"
Hypothesis:
- categorical negation
- politeness
- insistence (rudeness)

Hypothesis confirmed, but other findings too

Over 200 outliers
- Polite: guest knows what to expect: *razdevajtes'* 'take off your coat', *sadites'* 'sit down', *prisoedinjajtes'* 'join in', *zakusyvajte* 'eat a chaser', *zakurivajte* 'have a smoke', *zaezžajte* 'stop by', *zalezajte* 'get into the car'
- Insistence: hearer is hesitant: *stupajte* 'get going', *gljadite* 'look', *zabirajte* 'take'
- Insistence: hearer has not behaved properly (connection with negation): *provalivaj* 'get out of here', *končaj* 'stop', *ne perebivaj* 'don't interrupt', *ne prikidyvajsja* 'don't

pretend to be something you aren't', *ne peredergivaj* 'don't distort the facts', *otvalivaj* 'get out of here'

Other findings
- Polite requests: *vyručajte* 'help'
- Kind wishes: *vyzdoravlivajte* 'get well'
- Conventional construction: *davajte* 'let's/let me' (*posmotrim* 'take a look', *pomogu* 'help', *rasskažu* 'tell', *pokažu* 'show', *sdelaju* 'do')
- Idiomatic/culturally anchored: *proščaj(te)* 'farewell', *soedinjajtes'* 'unite' (slogan), *obogoščajsja* 'be prosperous' (NEP), *zapevaj* 'sing' (army), *ne pominaj lixom/kak zvali* 'bear no ill will/they just vanished', *spasajsja, kto možet* 'every man for himself', *na čužoj karavaj rot ne razevaj* 'don't take others' belongings'

Perfective imperative "make X happen!"

Hypothesis
- Rude
- Instructions
- Warnings

Hypothesis confirmed for rude and instructions, but not for warnings, and there are other findings too

Over 300 outliers
- Rude: *otstan'* 'leave me alone', *otpustis'* 'let me go', *perestan'* 'stop it'
- Instructions: (cooking) *vskipjatite* 'boil', (exercising) *sognite* 'bend', (official transactions) *raspišites'* 'sign for', (text instructions) *rassmotrite* [grafik x] 'see [figure x]'
- Additional findings
- Polite expressions: *izvinite* 'excuse me', *poterpite* 'please be patient', *predstav'te* 'imagine'
- Attention-directing: *posmotrite* 'look at', *vslušajtes'* 'listen to', *ponjuxajte* 'sniff', *ugadajte* 'guess'
- Discourse markers: *požaluj* 'perhaps', *razrešite* 'allow', *podskažite* 'prompt, tell', *uvol'te* 'spare'
- Religious: *Gospodi pomiluj* 'Lord have mercy', *blagoslovi otče* 'Father bless'
- Conventional construction: *dajte* 'let me' (*poceluju* 'kiss', *posmotrju* 'take a look', *vzgljanu* 'take a peek'
- Idioms: *xot' zalejsja/zavalis'* 'a very large amount', *ne razlej voda* 'really close friends', *čert razderi* 'to hell with it'

Imperfective non-past "is doing X"

Hypothesis
- On-going processes
- Concrete processes with a duration
- Simultaneous processes
- Repeated actions

Hypothesis NOT confirmed – gnomic situations instead

verb (3sg)	gloss	raw freq	% freq
javljat'sja (javljaetsja)	'be'	39543	92%
okazyvat'sja (okazyvaetsja)	'turn out to be'	10869	85%
podtverždat'sja (podtverždaetsja)	'be confirmed'	677	83%
vyjasnjat'sja (vyjasnjaetsja)	'be explained'	805	89%
kasat'sja (kasaetsja)	'concern'	9719	87%
isčerpyvat' (isčerpyvaet)	'exhaust'	100	89%
predopredeljat'sja (predopredeljaetsja)	'be predetermined'	34	85%
objazyvat'sja (objazyvaetsja)	'be obliged to'	480	92%
zatrudnjat'sja (zatrudnjaetsja)	'be made difficult'	275	86%
vleč' (vlečet)	'entail'	1555	85%

slyxat' (slyxaet)	'hear'	1	0%

Table 3: Imperfective verbs with very high or low incidence of non-past forms

10+1 outlier verbs (*slyxat'* 'hear' lacks non-past)
10 used in gnomic constructions:

- *diskussija vsegda <u>javljaetsja</u> naibolee produktivnoj formoj naučnogo obsuždenija problemy* 'a discussion <u>is</u> always the most productive form for scholarly debate on an issue'
- *dannoe obstojatel'stvo <u>vlečet</u> za soboj negativnye posledstvija* 'this situation <u>entails</u> negative consequences for the clients'
- *okazyvaetsja* 'turns out to be'; *vyjasnjaetsja, čto* 'it turns out that'; *čto kasaetsja* 'as far as X is concerned'; *storony objazujutsja* 'the parties are obliged to'; *zatrudnjajus' otvetit'* 'not sure'

Perfective non-past "will get X done"
Hypothesis
- Predicted actions
- Promised actions
Hypothesis is confirmed, but there are other findings too

84 outlier verbs
- Predictions: *prevysit* 'will exceed', *umen'šitsja* 'will decrease', *prodlitsja* 'will last', *naladitsja* 'will work out well', *vyzdoroveet* 'will get well', *zatrudnit* 'will make things difficult', *razoritsja* 'will go broke', *potrebuetsja* 'will be necessary', *podoxnet* 'will die', *pridetsja* 'will be necessary', *(ne) obojdetsja (bez)* 'will (not) manage (without)'
- Promises: *upravitsja* 'will take care of something', *postaraetsja* 'will try', *rasterzaet* 'will tear to pieces', *prokljanet* 'will curse'
- Performatives: *osmeljus'* 'I will take the liberty of', *procitiruju* 'I quote'
- Idioms: *ne pridereš'sja* 'don't find fault with', *ostal'noe priložitsja* 'the rest will come', *ot tebja ne ubudet* 'nothing is going to happen to you', *vragu ne poželaeš* 'I wouldn't wish it on my worst enemy'

Imperfective infinitive "to be Xing"
2 hypotheses
- Šmelev & Zaliznjak (2006): Imperfective used when action is controllable
- Divjak (2009): Imperfective has generic interpretation
Divjak's hypothesis is confirmed

verb	gloss	raw freq	% freq
plevat'	'spit'	900	65%
vvjazyvat'sja	'get mixed up in'	124	66%
izyskivat'	'search out, try to find'	92	64%
ispravljat'	'repair, carry out'	283	61%
peredelyvat'	'redo, alter'	230	57%
peresmatrivat'	'revise, reconsider'	198	66%
razvivat'	'develop'	1363	57%
razmeščat'	'place, distribute'	272	58%
raspoznavat'	'recognize, identify'	113	59%
sobljudat'	'observe, conform to'	1013	60%
soglasovyvat'	'conform to, agree with'	176	63%
učityvat'	'take into account, bear in mind'	1850	66%

Table 4: Imperfective verbs with very high incidence of infinitive forms

12 outlier verbs
- 1 is idiomatic: *mne plevat'* 'I don't give a damn'
- Others used in modal constructions

- Our data supports Divjak
- outlier verbs include uncontrollable actions: *vvjazyvat'sja* 'get mixed up in', *raspoznavat'* 'recognize, identify', *soglasovyvat'* 'conform to, agree with'
- outlier verbs target conformist behavior: *sobljudat'* 'conform to', *peredelyvat'* 'redo', *ispravljat'* 'repair', *učityvat'* 'take into account'

Perfective infinitive "to get X done"

2 hypotheses
- Šmelev & Zaliznjak (2006): Perfective used when action is controllable
- Divjak (2009): Perfective has specific interpretation; also used with "tentative verbs", *čtoby* 'in order to' construction and adverbs describing difficulty/importance of achieving X

Divjak's hypothesis is confirmed

verb	gloss	raw freq	% freq
naplevat'	'spit'	860	89%
sovmestit'	'combine'	385	87%
predotvratit'	'prevent'	792	86%
vossozdat'	'reconstruct'	248	84%
pomyslit'	'contemplate'	129	84%
sobljusti	'observe, conform to'	200	84%
sootnesti	'correlate'	118	84%
vozmestit'	'compensate'	304	83%
vospolnit'	'fill in'	171	80%
podrabotat'	'earn additionally, work up'	91	80%
srazit'sja	'fight, join in battle with'	108	80%
ustranit'	'remove'	686	80%

Table 5: Perfective verbs with very high incidence of infinitive forms

12 outlier verbs (*mne naplevat'* 'I don't give a damn')
- Modal uses for specific situations
- Tentative verbs:
    - *Poètomu my popytaemsja vospolnit' ètot probel, opirajas' na fakty i cifry.* 'That is why we are trying to fill in that gap, relying on facts and figures.'
- *Čtoby* 'in order to' construction:
    - *Posle zanjatija možno vypit' vody, čtoby vospolnit' ee poterju.* 'After working one can drink some water in order to make up for its loss.'
- Adverbs describing difficulty/importance
    - *Fruktami istinnyj deficit kalija vospolnit' očen' tjaželo, praktičeski nevozmožno.* 'It is very difficult, practically impossible, to make up for a real calcium deficit by [eating] fruit.'

Imperfective past "was X-ing"

Hypothesis
- Durative past actions
- Repeated past actions

Hypothesis is confirmed, but there are other findings too

verb	gloss	raw freq	% freq
slyxat' (slyxal)	'hear'	1161	93%
slyt' (slyl)	'have a reputation for'	212	72%
prosiživat' (prosižival)	'sit up repeatedly'	123	67%

proxaživat'sja (proxaživalsja)	'go for strolls'	207	69%
belet' (belel)	'show white'	366	70%
mračnet' (mračnel)	'show dark, glower'	99	75%
černet' (černel)	'show black'	348	75%
svešivat'sja (svešivalsja)	'hang, dangle'	105	74%
nadvigat'sja (nadvigalsja)	'be approaching'	260	66%
pomyšljat' (pomyšljal)	'think, dream of'	189	69%
unimat'sja (unimalsja)	'be stoppable'	381	82%
ščurit'sja (ščurilsja)	'squint'	196	67%
otšučivat'sja (otšučivalsja)	'make joking replies'	80	74%

Table 6: Imperfective verbs with very high incidence of past tense forms

13 outlier verbs
- Evidentials: *slyxal, slyl* 'heard'
- Defective paradigms: 10 of these verbs have no imperative
- Narration of observations: *belel* 'showed white', *černel* 'showed black', *mračnel* 'showed dark', *svešivalsja* 'hung, dangled'
- Negation for categorical statements: *ne pomyšljal* 'not thought about, dreamt of', *ne unimalsja* 'there was no stopping X'
- Behaviors accompanying dialog: *ščurilsja* 'squinted', *otšučivalsja* 'made joking replies', *mračnel* 'glowered'

Perfective past "Xed, got X done"

no outlier verbs

Conclusions
- Aspectual pairs behave similarly, regardless of whether they are formed via suffixation or prefixation
  - It may be that meanings of prefixes and verbs overlap
- Outlier verbs support some previous scholarship, but also present new insights and challenges
- Imperfective imperative
  - extend list of typical polite and rude expressions; added familiar uses
- Perfective imperative
  - new details on rude and neutral uses; added polite uses and use for attention-directing
- Imperfective non-past
  - gnomic reference (instead of ongoing-durative)
- Perfective non-past
  - predictions of improvements/problems, threats, promises, performatives
- Imperfective & Perfective infinitive
  - Mainly modal uses
  - Imperfective infinitives express generic circumstances
  - Perfective infinitives express specific situations (both circumstances and physical necessity/capacity); constructions with tentative verbs, adverbs, *čtoby* 'in order to'
- Imperfective past
  - evidentials, habituals, narration of observations

Impact
- **Better linguistic analysis**
- **Pedagogical applications**

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