

## On Russian verbal gaps and non-optimality in language

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### 1. Introduction

There is a long-standing debate about the nature of Russian verbal gaps. While most research in this area has focused on the relevance of a morphophonological alternation to this unexpected failure of regular inflection for Russian verbs, no attention has been given to what native speakers of Russian actually do with these notorious gapped verbs and how these verbs pattern in comparison to other verb types. Based upon the results of a simple psycholinguistic experiment, we show that the Russian gaps are not a homogeneous group, and that the alternation with which the gaps are correlated is not as uniform as previously portrayed. These facts are contrary to the assumptions of previous accounts and have significant consequences for the most interesting of the theoretical questions at hand – whether gaps are synchronically motivated from within the structure of the Russian verbal system.

*A paradigmatic gap* = For a lexeme L belonging to lexical class C, a paradigmatic gap exists if there is *no* synthetic form  $F(L_c)$  expressing a set of inflectional properties I, when the language normally has an  $F(x_c)$  expressing I. Any otherwise well-formed syntactic structure into which a hypothetical  $F(L_c)$  is placed is ungrammatical.

### 2. The facts of Russian

(1) Normal Russian non-past inflection:  
*vozit* ‘to transport, drive’

	SINGULAR	PLURAL
<b>1<sup>ST</sup> PERSON</b>	vožu	vozim
<b>2<sup>ND</sup> PERSON</b>	voziš’	vozite
<b>3<sup>RD</sup> PERSON</b>	vožit	vožjat

(2) Russian 1sg non-past verbal gap:  
*derzit* ‘to be imprudent’

	SINGULAR	PLURAL
<b>1<sup>ST</sup> PERSON</b>	*	derzim
<b>2<sup>ND</sup> PERSON</b>	derziš’	derzite
<b>3<sup>RD</sup> PERSON</b>	deržit	derzjat

a. Russian has an automatic morphophonological palatalizing alternation in 1sg non-past forms ([t] → [č], [š<sup>j</sup>]; [d] → [ž]; [s] → [š]; and [z] → [ž]), see (1). (“Non-defective dental stems”)

b. Vast majority of gaps occur in the environment where the morphophonological alternation is expected (2<sup>nd</sup> declension type), see (1) and (2) above. (“Defective dental stems”)

c. About 70 (prescribed) gaps with unique stems are known to exist (out of appx. 2,000 dental stems), compare to 100 listed in Halle (1973).

d. Prescriptive sources are fairly consistent in identifying the same group of Russian verbal gaps. Examples of frequently-cited gaps:

бдеть	bdet'	'to keep watch'
бузить	buzit'	'to protest'
галдеть	galdet'	'to make a hubbub'
дерзить	derzit'	'to be imprudent'
дудеть	dudet'	'to play the pipe'
ерундить	erundit'	'to do stupid or funny things'
затмить	zatmit'	'to eclipse'
кудесить	kudesit'	'to do magic'
очутиться	očutit'sja	'to find oneself; to come to be'
победить	pobedit'	'to win'
рысить	rysit'	'to trot'
соседить	sosedit'	'to be a neighbor'
убедить	ubedit'	'to persuade'
умилосердить	umiloserdit'	'to take pity on'
чудесить	čudesit'	'to do magic'
чудить	čudit'	'to behave in a weird way'
шкодить	škodit'	'to misbehave'

### 3. Theoretical questions, previous research

a. A central question in recent research: Idiosyncrasies or epiphenomena? Do paradigmatic gaps need to be explicitly captured by the grammar or are they epiphenomenal to conflicting grammatical principles, representing an “optimal failure” of the inflectional system? (Albright 2003, Baerman and Corbett 2006, Frampton 2001, Hudson 2000, Joseph and Sims 2006, McCarthy and Wolf 2005, Orgun and Sprouse 1999, Pertsova 2005, Rice 2005, Vincent 2005)

#### b. Notable contributions, Russian verbal gaps

- i. *Halle (1973)*: Russian verbal gaps are idiosyncrasies (marked by [-lexical insertion]).
- ii. *Baronian (2005)*: Russian verbal gaps are epiphenomena. Inflection class membership for dental stems is ambiguous, causing the 1<sup>st</sup> person singular non-past stem to be not lexically stored, and hence no form to be generated.
- iii. *Baerman and Corbett (2006)*: Russian verbal gaps are idiosyncrasies. The alternation in 1sg non-past of Russian verbs (i.e. t → č, d → ž, s → š, and z → ž) may have originally provided motivation for gaps in that cell, but that this factor was later subsumed by an analogic pattern of spread, with the stem-final consonants being the basis for extending gaps to new words.

### c. Unanswered questions about the data

- Do gaps pattern as a homogeneous group?
- Does the morphophonological alternation in the 1<sup>st</sup> person singular non-past apply consistently?
- Is variability (sometimes, but not always alternating) sufficient to posit causation?

## **4. Methodology**

### a. Experiment structure

#### i. *background questionnaire*

#### ii. *familiarity rating task*: infinitives presented in randomized order, judged on a 6-point Likert scale

1 = Я не знаю это слово ('I don't know this word')

2 = Я могу угадать значение этого слова, но я никогда не встречал(а) его ('I can guess the meaning of this word, but I have never encountered it.')

3 = Я встречал(а) это слово, но сам(а) его не использую ('I have encountered this word, but I myself don't use it.')

4 = Я использовал(а) это слово пару раз ('I have used this word a couple times.')

5 = Я иногда использую это слово ('I use this word sometimes.')

6 = Я часто использую это слово ('I use this word often.')

#### iii. *forced production sentence completion task*: Subjects saw sentences with verbs removed followed by infinitival form of verb and were asked to inflect the verb as needed to complete the sentence (cloze procedure).

*First screen*: Если постараюсь, \_\_\_\_\_ его в своей правоте.

Subjects push a button.

*Second screen*: Если постараюсь, \_\_\_\_\_ его в своей правоте.  
убедить

Subjects say their response.

#### iv. *confidence rating task*: After saying the word form subjects were asked to rate each production using a relative scale of their choosing. There was no feedback on whether participants' answers were "correct" or "incorrect".

### b. Participants: 22 adult native speakers of Russian, currently living in Columbus, OH, representing a wide demographic range (age, sex, place of origin, education, etc.)

### c. Stimuli: 90 target verbs and 160 fillers (250 total) presented in 1 of 6 counterbalanced orders. The same set of stimuli was used for all three tasks. Each stimulus was presented once. 8 conditions:

#### i. *defective dental stems* = 1sg gaps (e.g. *pobedit'* 'to win') \* 20 items

- ii. *non-defective dental stems* (verbs that meet all criteria for having a 1sg gap, but have regular inflection) (e.g. *posadit'* 'to plant') \* 10 items
- iii. *2<sup>nd</sup> conjugation verbs with non-past stems ending in [č],[š],[ž]* (e.g. *tušit'* 'to stew') \* 10 items
- iv. *1<sup>st</sup> conjugation verbs* (e.g. *rešatsja* 'to commit') \* 10 items
- v. *morphological doublets* (e.g. *hnykat'* 'to whine') \* 10 items
- vi. *nonce dental stems* (e.g. *bazit'*) \* 10 items
- vii. *nonce 2<sup>nd</sup> conjugation verbs with non-past stems ending in [č],[š],[ž]* (e.g. *zmručit'*) \* 10 items
- viii. *nonce 1<sup>st</sup> conjugation verbs* (e.g. *guhnut'*) \* 10 items

d. Data coding: E-prime automatically calculated response times and familiarity ratings. We also recorded speakers' confidence ratings and responses. From speakers' responses we calculated interspeaker agreement.

	Subj. 11	Subj. 13	Subj. 14	Subj. 16	Subj. 17
<b>ubedit'</b>	ubedju	ubežu	ubežu	ubedju	ubeždu
<b>čudit'</b>	čudju	čužu	čužu	čudju	čužu
<b>golosit'</b>	golosju	gološu	gološu	golosju	gološu
<b>prijutit'sja</b>	prijučus'	prijučus'	prijučus'	prijutjus'	prijučus'
<b>grezit'</b>	grezju	grežu	grežu	grežu	grežu
<b>oščitit'</b>	oščitju	oščušču	oščušču	ošču-, ošču-, ne znaju	oščušču

Table 1: Sample of responses to the forced production sentence completion task (gaps)

## 5. Results

### 5.1. Main results

- Gaps do not form a homogeneous group, according to a variety of measures (actual responses, response time, confidence ratings). These differences cannot be as explained as artifacts of word familiarity, sociolinguistic issues, word structure, etc.
- Every type of stimulus except the gaps produced well defined groupings according to our measures.
- The morphophonological alternation in the 1<sup>st</sup> person singular non-past does not apply consistently to either defective or non-defective dental stems. By contrast subjects consistently produced the 1<sup>st</sup> conjugation real forms.
- Doublets and gaps produced equal levels of interspeaker agreement in word production, while speakers gave gaps much lower confidence ratings.

## 5.2. Graphs

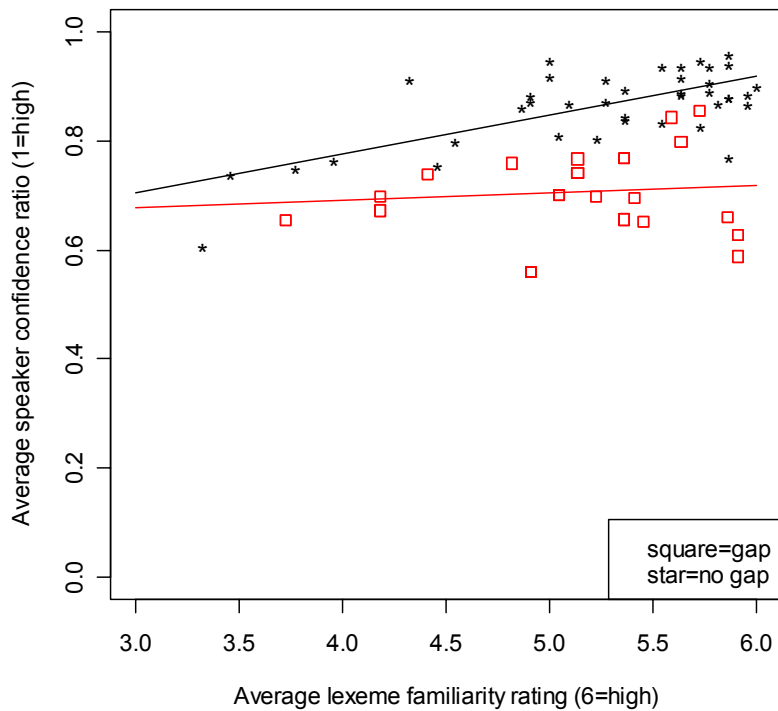


Table 2: Lexeme familiarity ratings vs. speaker confidence for gaps and non-gaps

Summary of Table 2: How familiar subjects are with a given lexeme has a significant effect on their confidence in producing a regularly inflected 1sg non-past form ( $R^2 = 0.4784$ ,  $p < 0.001$ ). But familiarity has no effect on speakers' confidence in producing forms for gaps ( $R^2 = 0.0117$ ,  $p = 0.6495$ ).

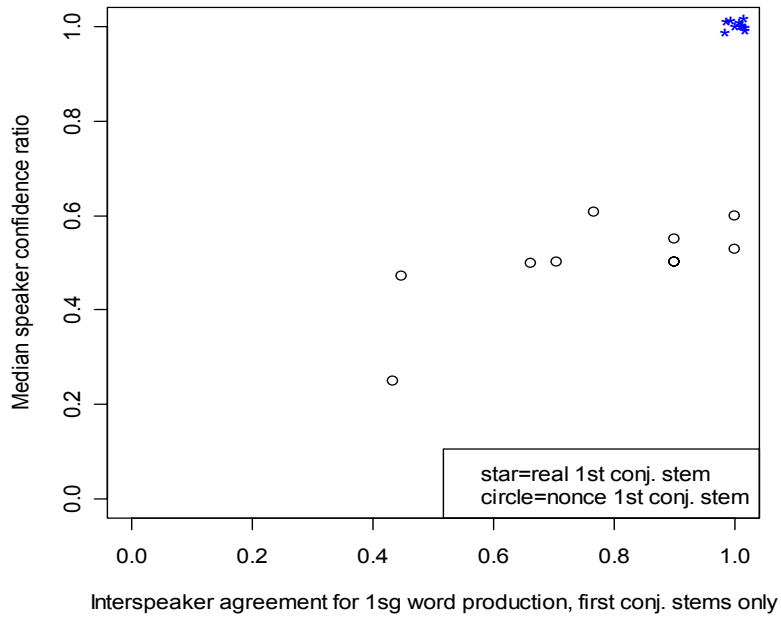


Table 3: Interspeaker agreement vs. speaker confidence for first conjugation stems

Summary of Table 3: Subjects were both entirely consistent and entirely confident in their productions of real 1<sup>st</sup> conjugation stems. Subjects were more consistent in their productions of first conjugation nonce stems than dental nonce stems (see Table 4).

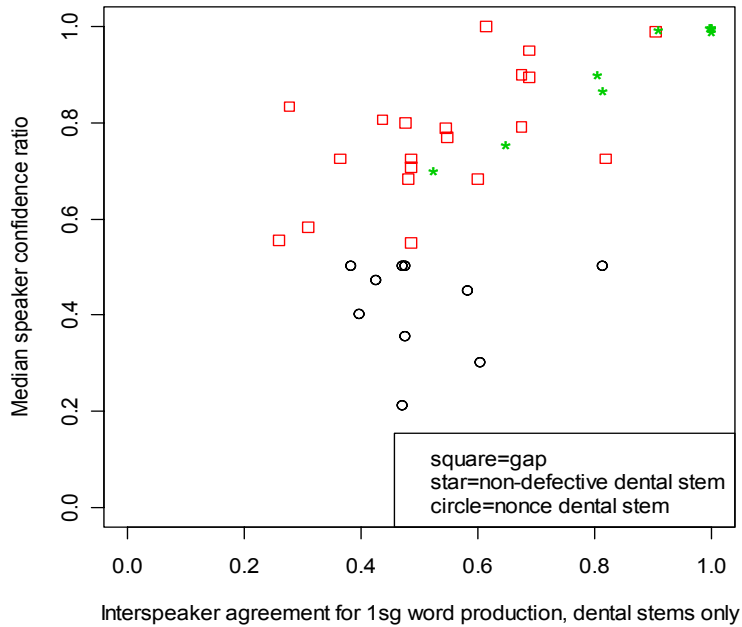


Table 4: Interspeaker agreement vs. speaker confidence for dental stems

Summary of Table 4: For non-defective dental stems, subjects' confidence in their productions goes down as interspeaker agreement (an inverse measure of community variability) goes down ( $R^2=0.965$ ,  $p<0.001$ ). However, agreement has a weaker effect on confidence when subjects produce gaps ( $R^2=0.3606$ ,  $p<0.01$ ).

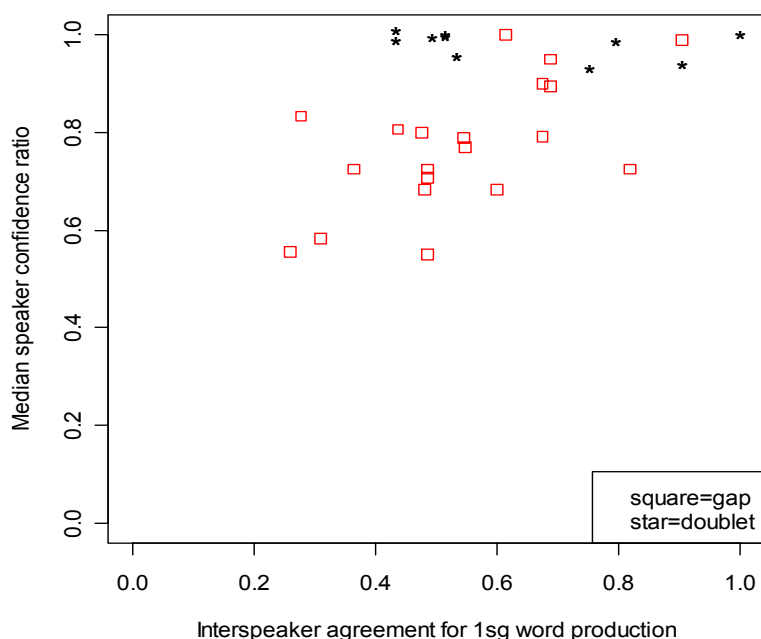


Table 5: Interspeaker agreement vs. speaker confidence, comparison of gaps and doublets

Summary of Table 5: While gaps and doublets show equivalent degrees of variability ( $t = 1.27$ ,  $df = 15.38$ ,  $p = 0.22$ ), speakers are more confident in their productions of the doublets than their productions of the gaps ( $t = 6.994$ ,  $df = 21.48$ ,  $p<0.001$ ).

### 5.3. Implications, in light of previous research

- Baerman and Corbett (2006) presuppose uniform alternation among productive dental stems. Our results show that this is not true, and Vinogradov (1969) suggests that this type of variability has existed in Russian for at least 100 years. (= evidence that the variable morphophonological alternation synchronically causes gaps)
- Gaps are not all alike. Many accounts are based on the assumption that a single explanation of gaps can be formulated, but we question this assumption because of this high level of idiosyncrasy (= evidence that gaps are NOT synchronically motivated from within the synchronic structure of Russian).
- A gaps-as-epiphenomena approach presupposes that gaps and regularly inflected forms belong to a single continuum in terms of agreement and speaker confidence (Albright 2003). This prediction is not consistent with our data. (= evidence that the variable morphophonological alternation does NOT synchronically cause gaps)

- Variability is not sufficient to explain speakers' confidence, meaning that neither a synchronic or a historical account of gaps arising from variability is likely to be sufficient.

5.4. Overall conclusion: There is one major piece of evidence in favor of arguments that gaps are synchronically caused (indirectly) by the palatalizing alternation in dental stems. There are three major pieces of evidence in favor of the argument that gaps are the idiosyncratic remnants of historical change. Baerman and Corbett (2006) thus seem to be more right than wrong. However, variability does not seem to be sufficient for explaining the cause(s) of gaps, either historically or synchronically.

## 6. A sneak peek of a better account via paradigmatic predictability

Paradigmatic predictability = predictability of a given inflected form from other inflected forms of the same lexeme.

	SINGULAR	PLURAL
<b>1<sup>ST</sup> PERSON</b>	xnykaju	xnykaem
<b>2<sup>ND</sup> PERSON</b>	xnykaješ'	xnykaete
<b>3<sup>RD</sup> PERSON</b>	xnykaet	xnykajut

	SINGULAR	PLURAL
<b>1<sup>ST</sup> PERSON</b>	xnyču	xnyčem
<b>2<sup>ND</sup> PERSON</b>	xnyčeš'	xnyčete
<b>3<sup>RD</sup> PERSON</b>	xnyčet	xnyčut

Table 6: Full paradigmatic predictability of the 1sg non-past form for doublets

	SINGULAR	PLURAL
<b>1<sup>ST</sup> PERSON</b>	vmešu	vmesim
<b>2<sup>ND</sup> PERSON</b>	vmesiš'	vmesite
<b>3<sup>RD</sup> PERSON</b>	vmesit	vmesat

	SINGULAR	PLURAL
<b>1<sup>ST</sup> PERSON</b>	vmesju	vmesim
<b>2<sup>ND</sup> PERSON</b>	vmesiš'	vmesite
<b>3<sup>RD</sup> PERSON</b>	vmesit	vmesat

Table 7: Paradigmatic non-predictability of the 1sg non-past form of dental stems

Generalization: In paradigmatic terms, the 1sg non-past cell is isolated for dental stems. It is not isolated for doublets.

Conclusion: If we build a paradigm-based inflectional model (e.g., Paradigm Function Morphology (Stump 2001)), and consider the ways that speakers take advantage of that structure, we come much closer to an explanation of why inflectional variation does not always lead to inflectional defectiveness. See Sims (2006) for details and formalization.

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