



# Does the Tolerance principle explain the problem of Russian paradigm gaps?



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## BACKGROUND

- Inflectional gaps in Russian: missing forms in the 1sg. non-past of certain 2nd conjugation verbs (so-called “defective verbs”).
- Much attention in recent work (e.g., Sims 2006, 2017; Daland, Sims, Pierrehumbert 2007; Baerman 2008; Albright 2009; Yang 2016; Pertsova 2016, Gorman and Yang 2019, etc.).
- The most cited example is the verb *pobedit'* ‘to win’, the 1sg. non-past of which is systematically replaced by a paraphrase *oderzhu pobedu* ‘I will obtain the victory’

1sg. $\emptyset$	1pl. <i>pobed-im</i>
2sg. <i>pobed-ish</i>	2pl. <i>pobed-ite</i>
3sg. <i>pobed-it</i>	3pl. <i>pobed'-at</i>

- Verb stems end in a dental consonant which normally undergoes morphophonological alternations, or palatalization, in the 1sg. non-past: /t/-/tʃ/; /d/- /z/; /s/-/ʃ/; /z/-/zʃ/. These alternations are not fully productive (contrary to, e.g., Baerman 2008, Sims 2006).

- According to Yang (2016), the inflectional gaps in Russian verbs can be explained by a formal model of productivity, the *Tolerance Principle*.

- The Tolerance Principle:** If R is a productive rule applicable to N candidates, then the following relation holds between N and e, the number of exceptions that could but do not follow R:

$$e \leq \theta_N \text{ where } \theta_N = \frac{N}{\ln N}$$

- That is, “for a rule to be productive, the number of exceptions must fall below a critical threshold” (Yang 2016:9).

- According to the Tolerance test, the consonant alternation rule [t]>[tʃ] in Russian cannot reliably apply to t stems : for 66 roots there are 22 exceptions while the productivity threshold is only 16 ( $\theta_{66} = 16$ ).

### Problems:

- The number of exceptions for stems with other final dental consonants does not seem to exceed the productivity threshold.
- Among verbs with t stem there are no defective ones (except for the only verb *sherstit'* ‘irritate the skin’).

## RESEARCH QUESTIONS

- Does the Tolerance principle predict paradigm gaps in verbs with other dental (d-, s- or z-) stems?
- Is the alternation rule productivity the only factor that contribute to paradigm defectivity in Russian or other factors could be at play?
- Are defective verbs always defective in Russian?

## MATERIALS AND METHODS

- The Tolerance test was applied to 2nd conjugation Russian verbs with dental t, d, s, and z stems. The list of verbs from Zalizniak (2003) inverse dictionary of Russian was used to count the numbers of roots, which undergo consonant alternations in the 1 sg. non-past as well as the numbers of exceptions.

Stems	Rules	Exceptions
t	tʃ	[tʃ]
d	3	d, $\emptyset$
s	ʃ	s, $\emptyset$
z	3	z, $\emptyset$

- In order to look at productivity of the same alternations, Google search was used for two groups of verbs:

- recent borrowings from English (e.g. *apgrejdit'* ‘to upgrade’)
- attested defective verbs (*pobedit'* ‘to win’)

## RESULTS

Results are presented in Tables 1,2 3.

Table 1. Frequency of roots and exceptions along with the threshold of productivity for t, d, s, and z stems.

	t	d	s	z
Total N of roots	119	88	46	50
Exceptions (e)	52* (-33 st)	15	8	4
Threshold ( $\theta_N$ )	25	20	12	13

\*The majority of exceptions for t stems refers to an unambiguous /st-/ʃtʃ/ alternation in verbs with st stems.

Table 2. Results of Google search for the 1 sg. non-past of some new verbs, borrowings from English, with d-stems.

Verbs	d	zh	zhd	d-zh	dzh
<i>friendit'</i> ‘to be friend’	4 690	119 000	3	1 060	2520
<i>zafrendit'</i> ‘to become friend’	6 480	16 300	0	345	649
<i>fludit'</i> ‘to flood’	33 200	97 500	7	9 390	328
<i>apgrejdit'</i> ‘to upgrade’	3860	525 000	0	336	811

Table 3. Results of Google search for the 1sg. non-past form of traditionally defective verbs with the root -bed-’.

Verbs	d	zh	zhd	d-zh	Frequency**
<i>pobedit'</i> ‘to win’	353 000	60 800	65 400	40 000	52.9
<i>ubedit'</i> ‘to persuade’	11 200	16 600	17 200	2 410	45.2
<i>ubedit'sa</i> ‘to make sure’	13 500	46 900	5 120	2 140	47.7
<i>razubedit'</i> ‘to dissuade’	317	2 730	139	368	0.8
<i>pereubedit'</i> ‘to convince’	2 000	10 500	590	725	2.4

\*\*Frequency in ipm (items per million) according to Lyashevskaja & Sharov (2009).

Table 3 shows the numbers of productions for the “missing” 1 sg. non-past form of highly frequent Russian defective verbs.

## DISCUSSION

- Yang’s (2016) proposal does not seem to account for defectivity of Russian verbs with dental d-; s- and z- stems because the threshold of productivity is higher than the number of exceptions for these verbs.

- As to t stems, if we exclude st stems, which always alternate with /ʃtʃ/ instead of /tʃ/, we see that the number of exceptions also does not exceed the critical number.

- In spite of that, consonant alternation rules in the 1 sg. non-past of Russian 2<sup>nd</sup> conjugation verbs are not fully productive. In Table 2 we see that Russian speakers sometimes produce non-alternating forms for new verbs. The 1 sg. non-past forms without alternation were attested in Russian dialects (e.g., Obnorskij 1953) and are quite frequent in informal colloquial speech. In my opinion, productions without alternation could be explained by paradigm leveling.

- We observe that speakers of the Russian language produce the 1 sg. non-past form not only for new borrowings, but also for well known defective verbs (e.g., *pobedit'* ‘to win’, *uchudit'* ‘to behave oddly’, etc.). This calls into question the existence of defectivity itself in Russian verbs. It seems that Russian speakers often choose one of two (or more) possibilities when they produce the 1sg. non-past form with a consonant alternation involved.

## CONCLUSIONS

- The Tolerance Principle does not seem to explain the phenomenon of inflectional paradigm gaps in Russian.
- Other linguistic and extralinguistic factors such as, for instance, the oral speech register may influence speakers’ production.
- Due to the increasing number of productions with and without alternation even for traditionally defective verbs, the defectivity in Russian verbs seems to be overestimated.
- Experimental work aiming to test the degree of speaker uncertainty with respect to their inflectional form production would be helpful for understanding paradigm defectivity in Russian.

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