

ACQUISITION OF VOWEL REDUCTION BY L2 LEARNERS: THE ROLE OF L2 ORTHOGRAPHY AND L2 MORPHOLOGY

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ABSTRACT

The present study identifies Russian orthography and problems with orthographic-phonological conversion as the major source of non-target reductions both in reading and spontaneous speech in the Russian interlanguage (IL) of American learners. It focuses on the role of inflectional morphology and shows that grammatical inflections have a higher rate of spelling induced reductions than the same positions (post-stress and word-final) in the stem. However, the rate of spelling induced reductions varies significantly depending on the individual ending. IL speakers pronounce grammatical inflections with spelling induced reduction to increase redundancy of the message and to preserve important linguistic information in the output to the hearer. This IL-specific strategy is aimed at coping with decreased redundancy in accented non-native speech carrying non-standard features. It leads to non-target productions because it is based on non-target IL reduction rules.

1. INTRODUCTION

Earlier research has identified second language orthography as an important influence on interlanguage phonology. It demonstrated that non-target vowel reduction of the unstressed orthographic “o” and “e” in the pronunciation of American learners of Russian both in reading and spontaneous speech is spelling induced, and depends on the phonetic position and phonetic context [4, 5, 6]. This study analyzes the role of Russian morphology in shaping the pattern of spelling induced vowel reduction by comparing reduction in grammatical inflections with the same phonetic positions (post-stress and word-final) in the stem. Studies in IL morphology demonstrated that the phonological environment plays a role in shaping the pattern of variation. Young found that the quality of the preceding and following phonological segments influenced plural -s marking in the English IL of Chinese learners [7]. Therefore, it can be concluded that IL grammatical morphology is influenced by the phonological factor. The study reported below demonstrates the opposite influence of Russian morphology on the phonological process of vowel reduction in the Russian IL of American learners. It reports the tendency of non-native speakers (NNSs) to increase redundancy of their oral message, which is reduced by various non-target features of their speech including non-native deviations in pronunciation, by non-reducing unstressed vowels in grammatical morphemes that carry important linguistic information.

2. BACKGROUND

2.1. L2 Orthography and L2 Morphology: Input and Output-Based Perspectives

Within the sociopragmatic approach to phonological variation developed in natural phonology, there are two types of phonological processes operating in opposite directions: foregrounding and backgrounding [3]. Foregrounding processes are directed towards the hearer, and increase perceptibility of the

message. They constitute the intensification of a phonological segment, such as the lengthening or tensing of a stressed vowel. Vowel reduction in native speech belongs to the opposite backgrounding processes and is motivated by the universal tendency towards economy of effort. Shortening and laxing of unstressed vowels, typically associated with vowel reduction, is an example of backgrounding processes [3, 137]. Thus, vowel reduction may be interpreted as a strategy to ease articulation, which leads to decreased redundancy of the message.

Several studies examine the influence of L2 orthography on IL phonology as a feature of written input to the learner [4, 5, 6, 8]. According to Young-Scholten [8], L2 orthography is part of “positive evidence” to a formal classroom learner that has negative effects on the acquisition of L2 phonology. When written input predominates in a beginning L2 classroom, it results in premature orthographic exposure before the establishment of L2 phonological categories. While the influence of L2 orthography on pronunciation is explained by the specific features of the input to a formal learner, the influence of L2 morphology on IL phonology may be both input-based and output-oriented. Indeed, functionally loaded grammatical morphemes may have a special status for IL speakers, because they were learned as members of grammatical paradigms and are associated with the linguistic information they are carrying. However, one can hypothesize that IL learners will use foregrounding to increase redundancy of the message. If the last assumption is true, then the specific features of the phonological shape of grammatical inflections will also be output-oriented, and geared towards the hearer.

2.2. Vowel Reduction in Russian

The vowels /o/ and /e/ have restricted distribution in Russian: they do not occur in the unstressed position. Russian has mobile stress, and it may shift even in different word-forms within the same paradigm. In such cases, which are extremely numerous in Russian, the reduced unstressed vowel automatically replaces the stressed one. The stressed /o/ is replaced by one of the two reduced variants of the vowel /a/, depending on the position in relation to word stress and word boundaries, which determine the degree of reduction. The stressed /e/ is replaced by /i/. (This is true for all stems and endings, except the Nominative case neuter noun and adjective endings, where for historical reasons, it is replaced by a reduced variant of /a/ as if it were a reduced /o/.) These alternations of stressed and unstressed vowels occur automatically in all parts of the word, stems and endings alike, but they are not reflected in spelling. This ultimately means that for the unstressed “o” and “e,” spelling is at odds with the actual pronunciation, and this systematic vowel alternation needs to be acquired by the learners of Russian as a rule of orthographic-phonological conversion.

Russian is a highly inflected language with inflectional morphology organized in nominal, pronominal, adjectival, and

verbal paradigms. Two features of Russian inflectional morphology are relevant for the present study. First, some case endings that have distinct grammatical functions are homonyms. Second, some unstressed case endings become homophones in pronunciation due to vowel reduction. This absence of differentiation leads to redundancy reduction in native speech, but does not lead to communication breakdowns in native speakers' interactions. Moreover, in native Russian speech, grammatical inflections undergo such strong reduction processes that even the inflections that are phonologically distinct may lose differentiation in casual pronunciation.

3. VOWEL REDUCTION IN THE RUSSIAN IL OF AMERICAN LEARNERS

3.1. Rationale for the Study

Previous research has shown that the rates of spelling induced reductions depend on the phonetic position and phonetic context, and that reading may produce higher rates of spelling induced reductions than spontaneous speech [1, 4, 5, 6]. Indeed, the pronunciation of the unstressed orthographic "o" as an [o]-like rounded vowel and of "e" as [e] cannot be attributed either to L1 transfer or to universal constraints on production and perception. American English also has the phenomenon of qualitative vowel reduction, unstressed vowels merging into a schwa. The reduced variants of /a/ and /i/ pronounced in place of the orthographic "o" and "e" do not present articulatory difficulties for Americans. However, the data on grammatical inflections and the corresponding positions in the stem were insufficient to analyze the factors shaping the vowel reduction pattern in grammatical morphemes. Accordingly, this study aims to analyze variations in the pattern of vowel reduction in individual grammatical paradigms and word-forms. It investigates non-phonetic factors shaping the pattern of vowel reduction in the pronunciation of formal adult American learners of Russian and tests empirically several claims:

1. The rate of spelling induced reductions will be higher in grammatical inflections than in the same phonetic position in the stem.
2. The rate of spelling induced reductions is related to token frequency of individual lexemes in the speaker's output.
3. The differences in the rates of spelling induced reductions depend on individual inflectional morphemes.
4. The rate of spelling induced inflections in grammatical inflections reflects the perceived importance of the particular paradigm and of the word-form within this paradigm.

3.2. Data Collection and Analysis

The data were collected from 10 American college level students who were studying Russian in different schools. Data collection proceeded in two steps. First, the experimenter gave the subjects an Oral Proficiency Interview, which is the standard test of oral proficiency developed by the American Council of Teachers of Foreign Languages and accepted in the American academia. On

the surface, this test appears to be a spontaneous, unstructured conversation on various topics, though it has a rigid internal structure. The subjects' oral proficiency was rated as Intermediate Low, Mid, and High on the ACTFL scale. Second, the same subjects read a specially designed text, a two-page story created in the Department of Phonetics at St. Petersburg State University, Russia [2]. The story is composed of 202 syllables that have the highest frequency in Russian speech. Recordings of spontaneous speech (Oral Proficiency Interviews) were analyzed using the method of expert listening by two different phoneticians, one of whom was the researcher. All the vowels pronounced in place of the unstressed "o" and "e" were transcribed. In case of discrepancies in the transcriptions, the opinion of a third independent expert was solicited. The phoneticians provided a maximally detailed phonetic transcription, making wide use of diacritic symbols. The same was done for the recordings of the reading, but in this case, all transcriptions were performed by the experimenter. At the next stage, the wide range of phonetic symbols used by expert listeners for each orthographic vowel was narrowed down to a small number of categories. The raw scores of productions in those categories were computed for each subject's spontaneous speech and reading aloud. The listening results were confirmed by spectrographic analysis of speech samples from one of the subjects [1].

3.3. Results

The computations of percentages of [o]-like vowels pronounced in place of the orthographic "o," and [e]-like vowels in place of the orthographic "e" were calculated for each position: post-stress and word-final.

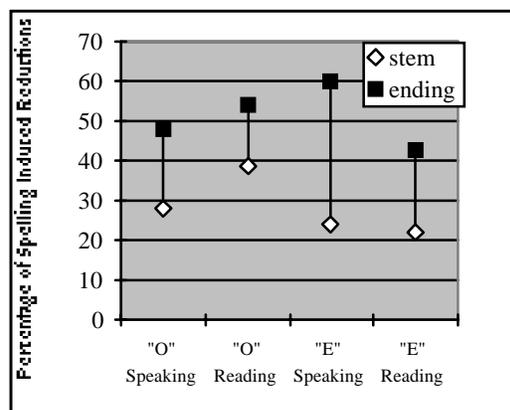


Figure 1. Influence of Morphology on the Rate of Spelling Induced Reductions

	stem		ending				
	CVCYC	CVCYCV	"-oj" Instrumental case feminine nouns	"-ov" Genitive case masculine nouns	"-oe" Nominative case neuter adjectives	"-om" Prepositional/ Dative case masculine adjectives	"-ogo" Genitive case masculine adjectives
S	31	31	93	65	39	37	0
R	35	56	81	43	69	56	25

S—Speaking
R—Reading

C—Consonant
V—Vowel

˘—Stress Mark

Table 1. Spelling Induced Reduction of the Unstressed “O” in Speaking and Reading: Post-Stress Position

Both in the post-stress and word-final positions the rate of spelling induced reductions is higher in grammatical endings than in the same positions in the stem. Figure 1 averages the percentages of spelling induced reductions for the post-stress and word-final positions and compares the differences between grammatical inflections and stems for the two vowels, “o” and “e,” and for two modalities: speaking and reading. Endings consistently show a higher rate of [o]-like and [e]-like pronunciations than stems.

The percentages of spelling induced reductions were computed separately for stems with different stress patterns and syllable structure and in unchangeable words, such as adverbs, modal words, quantifiers, comparatives. The results for individual stems that showed high token frequency in the subjects’ output were also listed separately. The rates of spelling induced reductions were established for each individual grammatical ending. This is true for homonymous endings as well, e.g., the ending “-e” in the Prepositional case of all nouns and the “-e” in the Nominative neuter nouns are not merged together.

Table 1 demonstrates the effect of the individual endings belonging to a particular grammatical paradigm on the rate of spelling induced reductions of the unstressed “o” in post-stress position. In speaking, the Instrumental feminine noun ending “-oj” shows an extremely high rate of spelling induced reductions (93%), while the Genitive case adjective ending “-ogo” has a 0% rate of spelling induced reductions. The reading results are similar, though less prominent (81% and 25% correspondingly). The results reported below are based on similar computations for the word-final position for the unstressed “o” and for the post-stress and word-final positions for the unstressed “e.” In the word-final position for the unstressed “o,” the words “éto” (“this”) and “spasíbo” (“thank you”) have the lowest rate of spelling induced reductions of all the stems. The past tense neuter verb form “b’yló” (“[it] was”) has the lowest rate of spelling induced reductions of all the endings.

The results for the unstressed “e” show the same effects. In the post-stress stems, the adverb “óchen” (“very”) has the lowest rate of spelling induced reductions, both in speaking and reading. In the endings, “mózhet (byt’)” (“may [be]”) also has the lowest rate of spelling induced reductions in speaking (no cases in reading). There is a significant difference between feminine and masculine Genitive case endings both in the speaking and reading conditions. In the word-final position, the Prepositional noun case ending “-e” has the highest rate of spelling induced reductions. This particular case ending has by far the highest frequency of all the grammatical endings in the subjects’ output.

3.4. Discussion

The results of this study confirmed the earlier findings pertaining to the role of inflectional morphology in shaping the pattern of spelling induced reduction in the IL of American learners of Russian [1, 4, 5, 6]. The American speakers of Russian in the experiment left more unstressed “o” and “e” vowels unreduced in grammatical inflections than in the same position in the word stem, where they belong to the word root

or the unchangeable affix. Since vowel reduction is an automatic process in native Russian speech, no such differences could be expected in non-native pronunciation if L2 speakers had applied the reduction rule regardless of the vowels’ role in the grammatical structure of the utterance, and had treated all the unstressed vowels in the same way. However, the study demonstrates that grammatical inflections have a special status for NNSs. NNSs use foregrounding processes in grammatical endings more often than in stems. In inflections that carry important grammatical information, IL speakers leave more vowels unreduced than in other parts of the word. This suggests that they are using a sociopragmatic strategy to increase redundancy of the message.

A detailed analysis of the differential rates of spelling induced reductions in individual stems and endings demonstrates several effects:

1. The rate of spelling induced reductions is not uniform across various endings. Individual grammatical inflections may have very high or very low rates of spelling induced reductions.
2. Lexical items that have high token frequency in L2 speakers’ output have lower rates of spelling induced reductions.
3. The grammatical inflection that occurs most frequently in the collected data has the highest rate of spelling induced reductions.

The role of frequency in phonological backgrounding processes in native speech has been noted before. Dressler and Moosmüller argue for native speech that “it is often assumed that frequent words undergo phonological casual speech processes more readily” [3, 141]. However, they claim that this role of frequency is indirect. According to them, token frequency is related to familiarity of the lexical item. The latter is a multi-component parameter, which includes among others the sociopragmatic aspect of familiarity with the speech situation. Therefore, the correlation between frequency and phonological casualness involving backgrounding processes is indirect [3, 141]. While the experiment does not allow to measure directly familiarity of the lexical items, the most frequent items in all the subjects’ speech samples happen to be very common words. This suggests that frequency and familiarity in this study are interrelated. At least as far as frequency is concerned, the study demonstrates that frequent words undergo the backgrounding processes in the IL more often, as they do in native speech, which allows to conclude that L2 speakers in this case are using a native sociopragmatic strategy.

The differential rate of non-target spelling induced reductions in grammatical inflections suggests that endings have different perceived importance for NNSs. A separate study is needed to determine what factors influence L2 speakers’ decisions. At this point, one can hypothesize that perceptual salience of individual endings; the perceived importance of the grammatical information they contain (e.g., oblique case endings seem to have higher rates of spelling induced reductions than the Nominative case, “citation” or dictionary form endings); and markedness (feminine endings

have higher rates of spelling induced reductions than masculine endings) shape the reduction pattern. It is remarkable that the Prepositional case ending, the most frequent one in the subjects' speech output as well as in the text for reading, shows the highest rate of spelling induced reductions. This result is at the opposite end of the spectrum from the frequent stems, which produced the lowest rates of spelling induced reductions. It should be noted that the Prepositional case, which is often the first oblique case to be introduced to Russian language learners in the classroom, has the most transparent form-function relations of all the oblique cases in Russian. The high rates of spelling induced reductions in the Prepositional case ending confirm the hypothesis that L2 speakers are willing to emphasize the important grammatical information that is pertinent to them. In doing so they are using a non-target IL-specific pragmatic strategy.

Therefore, one can conclude that the application of non-target IL vowel reduction rules seems to be governed in part by a pragmatic strategy used by L2 speakers to increase redundancy of their accented output containing non-target features.

4. CONCLUSION

The reported study analyzed the influence of L2 grammatical morphology on the pattern of vowel reduction in the Russian IL of adult American learners. In a formal classroom, with heavy emphasis on written input and limited access to native oral input, learners need to make a special effort to master the recoding rule in reading. Difficulties with orthographic-phonological recoding lead to non-target spelling induced reductions both in reading and speaking. The pattern of reduction depends on several phonetic and non-phonetic factors. This study showed that grammatical inflections have higher rates of spelling induced reductions than the same positions in the word stem. This suggests that L2 speakers are using the foregrounding phonological processes in grammatical inflections containing important linguistic information more readily than in other parts of the word. Further analysis revealed that lexical items with high token frequency in the speakers' output had lower rates of spelling induced reductions. Thus, frequent lexemes undergo phonetic casual speech

processes in L2 speech as well as in native speech. However, the endings, which have an important role in Russian declensional paradigms and which frequently occurred in the subjects' speech, had the highest rates of spelling induced reductions. This confirms the study's claim that L2 speakers are preserving the important grammatical information to increase redundancy of their output.

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REFERENCES

- [1] Bondarko, L. V., Gor, K. S., and Kobelskaya, T.V. 1997. The Fund of Sound Units of Russian Speech and the Issues in Teaching Russian Phonetics. *Bulletin of the Phonetic Fund of Russian Language*, 6. Bochum, Germany/St. Petersburg, Russia, 139-153.
- [2] Bondarko, L.V. and Stepanova, S. B. 1992. The Text Module "Phonetically Representative Text." *Bulletin of the Phonetic Fund of Russian Language*, 4. Bochum, Germany/St. Petersburg, Russia, 132-134.
- [3] Dressler, W. U. and Moosmüller, S. 1991. Phonetics and Phonology: A Sociopsycholinguistic Framework. *Phonetica*, 48, 135-148.
- [4] Gor, K. (Ogorodnikova, K.) 1998. *Interlanguage Phonology and Second Language Orthography*. St. Petersburg: St. Petersburg University Press.
- [5] Gor, K. (Ogorodnikova, K.) 1999 (in press). Experimental Research of Vowel Reduction in Russian: Implications for Interlanguage Phonology and for Teaching Russian Pronunciation. In: O. Kagan and B. Rifkin (eds.), *The Learning and Teaching of Slavic Languages and Cultures: Toward the 21st Century*. Columbus, Ohio: Slavica.
- [6] Ogorodnikova, K. 1992. Orthography in the Target Language: Does It Influence Interlanguage Phonology? *Working Papers in Educational Linguistics*, 8, 57-68, University of Pennsylvania Graduate School of Education.
- [7] Young, R. 1991. *Variation in Interlanguage Morphology*. New York: Peter Lang.
- [8] Young-Scholten, M. 1995. The Negative Effects of 'Positive' Evidence on L2 Phonology. In: L. Eubank, L. Selinker, and M. Sharwood Smith (eds.), *The Current State of Interlanguage*, 107-121. Amsterdam/Philadelphia: John Benjamins Publishing Company.