УДК 371.3
DOI 10.47388/2072-3490/lunn2022-57-1-138-154

EXPLORING BACKSLIDING IN NON-NATIVE SPEECH: A BASIS FOR NOVEL APPROACHES TO TEACHING GERMAN PRONUNCIATION TO RUSSIAN NATIVE SPEAKERS

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Since teaching pronunciation is nowadays associated predominantly with initial stages of language instruction, backsliding effects in phonetics that appear at later stages of language learning remain unaddressed and are thus subject to habitual backsliding and, eventually, fossilization. The paper investigates patterns and extent of foreign accent and backsliding in German consonants produced by Russian native speakers, focusing on two primary factors: allophone types and their phonetic position. The study presented in this article consisted in foreign accent judgements performed by a group of expert listeners who were presented with recorded samples of German speech produced by Russian learners. The study revealed a tendency where the most salient backsliding effects are generally associated with the most *aggravated* sounds. Under aggravation we mean a numerical value (ranging from 0 to 4) representing a sum of features that makes a normative production of a German phone difficult for Russian native speakers. An aggravated sound is a German phone that is phonetically different from any Russian sound, and/or representing a consonant contrast lacking in Russian (aspiration, semi-voicedness), and/or standing in a phonetical position that triggers negative transfer from Russian due to its phonotactic rules (palatalization in consonants preceding a front vowel). It was also established that, in most cases, no backsliding in a consonant manifests underlying orthography issues. The findings of this research project may be instrumental in developing new approaches to teaching German pronunciation to Russian learners, that would eradicate backsliding over the entire period of language instruction, taking into consideration the patterns of such backsliding at any given level of language proficiency.

Key words: pronunciation teaching; foreign accent; phonetic interference; negative transfer; contrastive analysis; backsliding.

Citation: Blok, Evelina Y. (2022) Exploring Backsliding in Non-Native Speech: a Basis for Novel Approaches to Teaching German Pronunciation to Russian Native Speakers. *LUNN Bulletin*, 1 (57), 138–154. DOI: 10.47388/2072-3490/lunn2022-57-1-138-154.

Исследование фонетического бэкслайдинга в речи на неродном языке как база для разработки инновационных подходов к постановке немецкого произношения носителям русского языка

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Поскольку постановка произношения осуществляется, как правило, на начальных этапах обучения иностранному языку, эффекты фонетического регресса (откат, или бэкслайдинг), проявляющиеся на более поздних этапах обучения, не подлежат проработке и в конечном итоге приводят к фоссилизации. Цель данной работы — исследование как общей картины, так и степени выраженности иностранного акцента и бэкслайдинга в немецких согласных в речи носителей русского языка. При этом рассматривались два фактора: тип аллофона и его фонетическая позиция. В ходе исследования группе экспертов для оценивания предлагались записи немецкой речи носителей русского языка, на основе которого была выявлена следующая тенденция: наиболее сильно акцент проявляется в наиболее *осложненных* звуках. Под *осложнением звука* мы понимали целое число (в диапазоне от 0 до 4), равное сумме всех характеристик, затрудняющих его нормативное произнесение. К осложненным согласным были отнесены все немецкие согласные звуки, фонетически отличные от звуков русского языка, а также согласные, содержащие отсутствующий в русском языке контраст (аспирация, полузвонкость) или стоящие в фонетической позиции, способствующей отрицательному переносу из русского языка под действием его фонотактических правил (палатализация согласных в позиции перед гласными переднего ряда). Кроме того, обнаружилось, что отсутствие (ожидаемого) бэкслайдинга в большинстве случаев связано с особенностями орфографической записи соответствующих стимулов. Принимая во внимание результаты исследования, представляется оправданной разработка новых методов постановки немецкого произношения у русскоязычных носителей, позволяющих подавлять фонетический регресс на всем протяжении обучения с учетом его особенностей на отдельных этапах.

Ключевые слова: постановка произношения; иноязычный акцент; фонетическая интерференция; отрицательный перенос; контрастивный анализ; бэкслайдинг.
Цитирование: Блок Э. Е. Исследование фонетического бэкслайдинга в речи на неродном языке как база для разработки инновационных подходов к постановке немецкого произношения носителям русского языка // Вестник Нижегородского государственного лингвистического университета им. Н. А. Добролюбова. 2022. Вып. 1 (57). С. 138–154. DOI: DOI 10.47388/2072-3490/lunn2022-57-1-138-154.

1. Introduction

The extent and pattern of foreign accent depends on a vast variety of factors. Some of them are rather remote from linguistic competence itself, e.g., it has been substantiated that having received musical training contributes to better distinguishing and producing foreign sounds, as overviewed in (Konyakhina & Ivanov 2021). However, the main factor of influence is the learner's mother tongue. In the past fifty years, there has been much debate over the nature of

impact a learner's mother tongue (hereinafter L1) has on a foreign language (hereinafter FL) he/she is instructing in. Naturally, as ideas in this area evolved, approaches to teaching FL phonetics underwent changes as well, as overviewed in (Lopareva 2014). Up till now, the theory of Interlanguage proposed by Selinker (Selinker 1972) remains a popular approach exploring the role of L1 in explaining learners' mispronouncings in the process of foreign language acquisition (hereinafter FLA), although some of its aspects encountered much criticism, e.g. as reviewed in (Al-khresheh 2015). According to the theory, a learner produces a mental representation of a linguistic system (Interlanguage) that is neither L1 nor FL, but rather the learner's (implicit) assumptions on what FL norm is. On initial stages of FL learning, the Interlanguage norm is close to that of the learner's L1, but keeps developing and can potentially approach FL norm – a process referred to as 'Interlanguage Continuum' (Tarone 1983). An important feature of Interlanguage is backsliding, or regressing to an earlier stage of development: When a learner seems to have fully mastered an FL norm, there may occur backsliding to an Interlanguage norm the learner had used before. Afterwards, the resulting Interlanguage norm may undergo fossilisation: No matter how much exposure to FL the learner has afterwards, there is no headway in areas that underwent fossilisation.

Summarising the above, all basic notions of FLA in the area of pronunciation training can be brought together. Differences between structures of FL and L1 lead to systematic errors in the FL phonology causing foreign accent (negative transfer, or interference), but even if an FL pronunciation norm has been successfully mastered at some point, due to backsliding it can once again shift to an earlier Interlanguage norm. There, it can get fossilised. Research proves, though, that backsliding can be partially eradicated, at least in grammar acquisition (Fauziati 2011). In pronunciation learning, modern teaching techniques seem to fully disregard backsliding: Pronunciation instruction is predominantly associated with initial stages of language learning whereas learners of more advanced levels cease to get explicit phonetical training whatsoever: "Communicative language teaching de-emphasized pronunciation; it was assumed that sufficient input would help learners improve oral production. However, a serious misinterpretation of this situation was the notion that pronunciation teaching is ineffective" (Derwing & Munro 2009: 481).

Numerous studies have recently addressed phonetic deviations in vowels or consonants produced by native speakers of various L1s when speaking German (e.g., Bley-Hiersemenzel &. Schiel 2011; Nimz 2011; Smith & Peterson 2012) or Russian (e.g., Dmitrieva, Jongman & Sereno 2010; Kangaspunta 2011; Hacking, Smith, Nissen, & Allen 2016). However, German-Russian cross-language pair seems to have received relatively little attention. One of the recent

studies investigated phonetic deviations in Russian speech produced by bilinguals belonging to the ethnicity of Russia Germans (Baykova & Voytov 2019), but little research seems to be aimed at phonetical negative transfer in German speech of Russian native speakers (Böttger 2008; Potapova & Potapov 2011; Cherepanova 2019), none of them investigating the problem in the context of backsliding. To develop effective and yet timesaving FL pronunciation teaching methods, though, it is critical to gain more knowledge about backsliding mechanisms.

Ideally, experimental studies of backsliding should involve learner groups of all general proficiency levels (A1-C2) and build on the entire range of cross-language phonological differences. This study is limited to comparative analysis of *consonant* production across *two* broader learner groups (beginners vs. advanced). Within the groups, the influence of two segmental factors (target allophone type and position) on normativity and extent of backsliding was investigated.

Below listed are original hypotheses (L1=Russian, FL=German):

1. Proportion of mispronounced FL sounds was anticipated to be larger in the advanced group.

2. Backsliding was hypothesized to affect sounds of various *difficulty* to a different extent. The initial assumption was that most *difficult* German sounds for Russian native speakers would be most vulnerable, which conforms well to pedagogical practice. In order to measure this *difficulty*, the notion of *phone aggravation* was introduced, i.e. influence of cumulative factors stemming from mutual FL-L1 cross-linguistic discrepancies and thus triggering negative transfer from L1. The more of the factors are present in a phone, the more aggravated the phone is. Factors of consonant phone aggravation considered in this study were as follows:

a. *Proximity.* An FL sound that is altogether alien to L1 is aggravated *by nature*. It is transcribed by an IPA symbol not used for transcribing any phone in L1 inventory ("empty cell" situation). German sounds that are very similar to Russian ones, the only difference being that of articulation base (this essential notion is closely reviewed in [Kedrova & Borrissoff 2013]), e.g. [p] or [k], belong to the other end of the scale being non-aggravated. They are transcribed in both languages by means of the same IPA symbol and may be regarded as equivalents. Between the two poles, there is the *grey zone* of sounds that are rather close to their Russian counterparts, but still differ significantly from them, this difference being captured in the IPA notation, as reflected in (Handbook of the IPA 1999). One example could be Russian stops /t/, /d/ that are dental (in IPA notation: [t̪], [d̪]) as contrasted to German alveolar fricatives [t] and [d]. Such moderately aggravated sounds have an intermediary position on the prox-

imity scale. In this paper, they are regarded one-fold aggravated, whereas sounds altogether absent in Russian are graded as two-fold aggravated.

b. *FL* systematic *features*. Systematic consonant features lacking in L1 but present in FL aggravate a consonant phone. For the German-Russian pair, these features are aspiration (in tense stops) and semi-voicedness (in lax fricatives).

c. *Triggering phonetical position*. Aggravation can also stem from phonetical position: An FL sound may occur in a phonetical position triggering negative transfer due to L1 phonotactic rules. The commonest example are German consonants located before a front vowel. In German, only velar stops are partially palatalised in this context whereas in Russian the contrast of palatalized and unpalatalized consonants is one of the most salient consonant features. E.g., Russians experience no problems producing [m] in words like *'**m**alen'* ('to paint'), but they are very likely to mispronounce the sound in *'**M**itte'* ('middle') or *'**m**üde'* ('tired') replacing the normative [m] with a deviated fully-palatalised [m^{j}].

The above three factors a)-c) interact in German consonants produced by Russian native speakers making some of them two-, three- or even four-fold aggravated. An example of such a manifold aggravated phone is German [d̥] standing before a front vowel, e.g. in *'**D**ienstag'* ('Tuesday'), where it is a) alveolar (Russian [d̪] is dental), b) semi-voiced (Russian has no systematic semi-voicedness), and c) precedes [i:].

The initial presumption was that backsliding effects in a sound would tend to be the more salient, the more aggravated it is. However, since consonant classes vary widely in many aspects (place and manner of articulation, phonation, muscular energy involvement etc.), it was viewed as reasonable to investigate backsliding scale within each consonant class/subclass separately.

2. Materials and Methods

2.1. Participants

Two participant teams were involved in the study. 8 native Russian speakers learning German recruited from the Moscow State University (Philological Faculty) student pool participated in the experiment as talkers. They ranged 18-21 with an average age of 19.63 (SD 1.32). All talkers completed a language background questionnaire reporting on their reference level of German and were subsequently provided with detailed instructions regarding the forthcoming recording session. Basing on the questionnaire data they provided, they were divided into two talker groups of equal size: Those who had been learning German for less than a year were included in the beginners' group, while the rest formed the advanced group.

The talkers were recorded in a sound isolated studio using a TASCAM DR-40 Linear PCM Recorder (16 bit resolution, 48000 Hz sampling rate, stereo).

The recorded data were then presented to a listeners' team of 5 experts including 3 university instructors of German and 2 linguists proficient in German and using it for the purpose of research, all of them Russian native speakers with an average age of 40 (SD 7.82).

2.2. Procedure

A sequence of lexical stimuli representing German consonant allophones was made up in accordance with results of a contrastive analysis (hereinafter CA) that involved inventorying German and Russian consonant allophones based on multiple literary sources (Krech 1971; Avanesov 1984; Kohler 1995; Raevskij 1997; Zinder 2003; Duden 2006; Becker 2012; Knjazev & Pozharickaja 2012). For methodology and details of the CA, see (Blok 2016).

In the experimental sequence, each stimulus represented a German allophone in a phonetic environment. For the vast majority of German allophones, two phonetic environments were included: a) preceding a front vowel; b) in any other phonetic position, i.e. preceding a non-front vowel or a consonant, or in a word final position. The amount of the 'allophone+position' dyads totaled to 70. Further, for each 'allophone+position' dyad, 4 stimuli (singular or, in some cases, plural nouns and pseudo-nouns in the nominative case) were included in the experiment sequence: 2 frequent nouns falling into active vocabulary for as early a level of language proficiency as A1, 1 rare noun and 1 pseudo-word. E.g., for the dyad allophone [n] preceding a front-vowel, the following stimuli were selected: *'Schnitzel'* ('cutlet') and *'Tennis'* ('tennis') as part of active vocabulary, '***N****iete'* ('lame duck') as a rare noun, and *'****N****icktebuhn'* as a pseudo-word. Frequent nouns stemmed from (Buscha & Szita 2011), rare words were selected using the Leipzig Online Dictionary (Leipzig Corpora Collection / Deutscher Wortschatz n.d.), and finally, pseudo-words were made up by means of an online generator Wuggy (Keuleers & Brysbaert 2010). However, for some of the dyads, no satisfactory frequent stimuli could be detected. All the above considered, the number of lexical stimuli in the experiment sequence amounted to 263 units. Each stimulus was elicited from a talker four times: three times in an isolated position and once embedded in a carrier phrase. Thus, 263 x 4 utterances were recorded from each talker, resulting in 1052 x 8 = 8416 utterances altogether. The stimuli in the sequence were ordered randomly. The sequence was divided into three blocks of equal size. No training session was provided.

Out of the recorded speech samples, an isolated utterance and an utterance cropped out of the carrier phrase was extracted for each stimulus. The resulting set was passed on to the listeners' team. Having completed a language back-

ground questionnaire, they were asked to audition the set and transcribe the stimuli they hear (intelligibility test). It is noteworthy that the listeners did not know which sound was target allophone in a stimulus. Afterwards they were asked to once more listen to the records and assess the stimuli they hear either as deviant from German pronunciation norm or not. Further, for utterances evaluated as deviant, they were asked to mark the deviant part in the word transcription. The transcriptions were subsequently tabulated, and a cumulative assessment was ascribed to each target allophone ranging from -5 (evaluated as deviant by all 5 listeners) to +5 (not marked as deviant by any of the listeners). Finally, the individual assessments were divided by the number of listeners (5) to end up on a scale ranging from -1 to +1. Then, the assessments were summed over all talkers and averaged yielding *non-normativity index* (NNI) of the target consonant (see Table 1):

Table 1. Calculating Non-Normativity Index (NNI) of target consonants in individual stimuli

#	Stimulus	Isolated/phrase	BS1	BS2	BS3	BS4	AS1	AS2	AS3	AS4	NNI (BSs)	NNI (ASs)	NNI (Overall)
…	…	…	…	…	…	…	…	…	…	…	…	…	…
32	Zeitu**ng**	isolated	1	1	1	1	0.2	1	-0.2	-0.6	1	0.1	0.55
33	Schro**tt**	isolated	1	1	1	1	-0.4	1	1	0.6	1	0.55	0.775
34	1. K**r**utsche	isolated	1	1	1	1	0.2	1	0.4	0.2	1	0.45	0.725
34	2. Kru**tsch**e	isolated	1	1	1	1	-0.6	0.6	0.8	-0.2	1	0.15	0.575
35	Po**l**izei	isolated	0.8	1	1	1	1	1	1	0.6	0.95	0.9	0.925
…	…	…	…	…	…	…	…	…	…	…	…	…	…

Note. *BS* = talkers from the beginners' group; *AS* = talkers from the advanced group.

NNI can thereby be regarded a measure of pronunciation normativity: The bigger its value, the closer pronunciation of the sound to FL norm. As can be seen from the table, NNI was also calculated for either talker group (beginners vs advanced), which enabled calculating NNI delta values between groups associated with extent of backsliding effects.

3. Results and Discussions

3.1. Mean Pronunciation Normativity across Both Learner Groups

Basing on individual NNI values, mean NNI values for each talker group were calculated (see Fig. 1). As anticipated, it proved to be higher in the beginners' group (0.79 against 0.62) signaling backsliding.

3.2. Pronunciation Normativity across Consonant Classes

In the German-Russian cross-language pair, systematic contrasts missing in either L1 or FL are palatalization, aspiration, and semi-voicedness. Russian speakers tend to palatalize whatever FL consonant preceding a front vowel, to produce fully voiced obstruents where semi-voicedness is required, and to pronounce aspirated tense consonants with little or no aspiration.

3.2.1. Stops

German velar stops are a unique group within the class as they are routinely palatalized in German (Miljukova & Nork 2004). However, as compared to Russian, this palatalization is only partial and can be progressive, i.e. a consonant is palatalised *afrer* a front vowel, as in *'Techni**k**'* ('technology'). This palatalization type is not supported by Russian phonotactic rules (hence, [k^{j}] in positions other than before a front vowel was regarded as a separate dyad).

Below, tense stops are ranked by their NNI delta values (i.e. difference between NNI values obtained in both learner groups), from least to greatest (the darker background colour of a cell, the more aggravated the phone is) (see Table 2).

Table 2. Delta NNI values of tense stops across learner groups

	[k^{hj}]	[k]	[k^{j}]_FrV	[t]	[p]	[k^{h}]	[t^{h}]	[k^{hj}]_FrV	[k^{j}]	[p^{h}]	[p]_FrV	[t]_FrV	[t^{h}]_FrV	[p^{h}]_FrV
Beginners	0.86	0.90	1.00	0.87	0.96	0.96	0.92	0.83	0.91	0.83	0.69	0.79	0.64	0.64
Advanced	0.79	0.79	0.88	0.74	0.83	0.79	0.72	0.62	0.68	0.59	0.44	0.52	0.36	0.36
Delta NNI	0.07	0.11	0.12	0.13	0.13	0.17	0.20	0.21	0.23	0.24	0.25	0.27	0.28	0.28

Note. *_FrV* = preceding a front vowel.

The greatest NNI delta values (0.27-0.28) in the subclass are associated with manifold (two- or three-) aggravated phones, all of them preceding a front vowel, two being alveolar ([t], [t^{h}]) and two aspirated ([p^{h}], [t^{h}]).

Lax stops also include palatalized phones ([g^{j}], [g̊^{j}]). They are ranked by their NNI delta values (see Table 3).

Table 3. Delta NNI values of lax stops across learner groups

[g̊^{j}]_FrV	[g^{j}]	[d̥]	[g]	[b]_FrV	[b̥]	[d]	[b]	[d]_FrV	[b̥]_FrV	[g̊]$_{\infty}$	[g^{j}]_FrV	[d̥]_FrV

Beginners	0.79	0.91	0.86	0.99	0.93	0.99	0.93	0.99	0.93	0.84	0.91	0.64	0.74
Advanced	0.80	0.86	0.78	0.89	0.83	0.88	0.82	0.88	0.77	0.63	0.69	0.42	0.33
Delta NNI	-0.01	0.06	0.08	0.10	0.10	0.11	0.11	0.11	0.16	0.21	0.22	0.22	0.41

Note. *_FrV* = preceding a front vowel.

It is noteworthy that [g̊ʲ] was better managed by the advanced than by beginners resulting in a negative NNI delta value (-0.01), which may be accounted for by underlying spelling rules: Beginners might have been puzzled by *Gy-* letter combination in some of the stimuli. Corresponding table cells are marked by horizontal stripes.

Greater NNI delta values signaling stronger backsliding are generally demonstrated by manifold aggravated sounds in the right part of the table:

– three-fold aggravated: [d̥]_FrV (alveolar, semi-voicedness, palatalization);

– two-fold aggravated: [b̥]_FrV (semi-voicedness, palatalization), [d]_FrV (alveolar, palatalization).

However, it is difficult to find an explanation for relatively high delta values scored by [gʲ] before front vowels and by [g̊]: The former phone is an equivalent to the Russian [gʲ] and the latter is merely one-fold aggravated (semi-voiced). Obviously, this fragment merits closer consideration.

3.2.2. Fricatives

Unlike stops, most German tense fricatives have just one phone each. The only exception is /x/, which has two phones: the velar [x] and the uvular [χ]. The latter is pronounced after open back vowels /a(:)/, /ɔ/ (Kohler 1995).

Below, NNI delta values of tense fricatives in ascending order are represented (see Table 4).

Table 4. Delta NNI values of tense fricatives across learner groups

	[ç]	[s]_FrV	[ʃ]_FrV	[f]_FrV	[ʃ]	[s]	[f]	[h]	[χ]	[x]	[ç]_FrV	[h]_FrV
Beginners	0,66	0,69	0,53	0,46	0,88	0,93	0,71	0,67	0,98	0,94	0,06	0,58
Advanced	0,76	0,79	0,56	0,44	0,82	0,87	0,62	0,54	0,84	0,76	-0,19	0,31
Delta NNI	-0,10	-0,10	-0,03	0,02	0,06	0,06	0,09	0,13	0,14	0,18	0,25	0,27

Note. *_FrV* = preceding a front vowel.

A negative NNI delta value across learner groups meaning there is no backsliding is evidenced three times: in [ç] in non-palatalization environment (i.e., in word-final position or before a consonant) and in both sibilants ([s] and

[ʃ]) before a front vowel. An explanation of the relatively low NNI demonstrated by beginners in words like *'Gespräch'* ('conversation') or *'Nichte'* ('niece') may be rooted in intricate spelling rules. Both [x] and [ç] are spelt by the same *ch* letter sequence, but whereas [x] is an "easy" sound (and both groups scored high NNI values in them), [ç] is very problematic with both groups demonstrating a high rate of mispronouncings. However, the advanced were a little better (0.76) here than the beginners (0.66). This might be so just because they have a better command of the intricate reading rules. As for [s] and [ʃ], no simple explanation of better results in the advanced group seems to be in view.

The right part of the table comprises German consonants demonstrating the largest degree of backsliding. Two rightmost positions are held by consonants ([h], [ç]) in a palatasation-prone environment, as in *'Höhle'* ('cave') or *'China'* ('China'). Both sounds are three-fold aggravated ("empty cell" in L1, palatalization).

Backsliding in lax fricatives is displayed below (see Table 5).

Table 5. Delta NNI values of lax fricatives across learner groups

	[ʒ̊]	[ʒ]	[z]	[v]	[v̥]	[z]_FrV	[ʒ̊]_FrV	[v̥]_FrV	[ž̊]	[v]_FrV
Beginners	-0.95	0.43	0.81	0.95	0.98	0.66	0.68	0.73	0.79	0.78
Advanced	-0.39	0.46	0.77	0.81	0.82	0.48	0.49	0.54	0.59	0.52
Delta NNI	-0.56	-0.03	0.04	0.14	0.16	0.18	0.19	0.19	0.20	0.26

Note. *_FrV* = preceding a front vowel.

As one can see, [ʒ] and [ʒ̊] stand apart demonstrating negative NNI delta values. This can be accounted for by a special status of /ʒ/ in German occuring solely in loanwords. The main problem for Russian native speakers is not articulating [ʒ] or [ʒ̊] *per se*, rather, it is challenging to read the words correctly as they are spelt in accordance with orthographic norms of the languages of origin. For /ʒ/, it is mostly French. If a learner is not familiar with a loanword, he/she is likely to read it according to German orthographic norm that applies elsewhere, hence mispronuncings *('[g]enie'*, *'Gara[g]e'*, *'[j]ournalist'* instead of *'[ʒ̊]enie'*, *'Gara[ʒ]e'*, *'[ʒ̊]ournalist'*). Better results among the advanced should be explained by the fact that they are better acquainted with the rules of reading loanwords.

As for labial and alveolar fricatives, the NNI values of fully- and semi-voiced varieties are close to each other in both groups (e.g., in the beginners' group: /v/: 0.95 for fully- and 0.98 for semi-voiced realisations; /z/: 0.81 for ful-

ly- and 0.79 for semi-voiced realisations). This proximity may be due to the listeners' insensibility to semi-voicedness. Indirectly, an evidence to this is the fact that NNI values of semi-voiced phones of /v/ and /z/ are somewhat higher in both learner groups, which is otherwise puzzling given that there is no systematic semi-voicedness in Russian.

With regard to backsliding, the phones in the table fall into three groups. Manifold aggravated phones demonstrate the largest delta values and are located to the right of the table. In the middle, there are one-fold aggravated [z] (alveolar) and [ɣ̬] (semi-voicedness) and the only non-aggravated phone in this subclass [v]. Finally, both phones of the /ʒ/ phoneme are in the leftmost position indicating no backsliding.

3.2.3. Affricates

German has 3 affricates: ([p͡f], [t͡s], [t͡ʃ]). Their NNI values are demonstrated below (see Table 6). Enclosed in the parenthesis are NNI values of the phones constituting the affricates, as displayed above (see Tables 2 and 4).

Table 6. Delta NNI values of affricates across learner groups

	[t͡s]	[p͡f]	[p͡f]_FrV	[t͡ʃ]
Beginners	0.84 (0.87, 0.93)	0.89 (0.96, 071)	0.36 (0.96, 0.46)	0.60 (0.87, 088)
Advanced	0.81 (0.74, 0.87)	0.80 (0.83, 0,62)	0.25 (0.83, 0.44)	0.33 (0.74, 082)
Delta NNI	0.03	0.09	0.11	0.27

Note. *_FrV* = preceding a front vowel; bracketed are NNI values of integral parts when in a 'stand-alone' position.

All German affricates are regarded aggravated since neither has an equivalent in Russian. Both parts of [t͡s] are alveolar as contrasted to dental in Russian, so it can be regarded one-fold aggravated. [p͡f] and [t͡ʃ] are cases of two-fold aggravation because they lack in Russian, whereas [p͡f]_FrV represents three-fold aggravation ("empty cell" in L1, palatalization).

For both affricates in the left part of the table ([t͡s] and [p͡f]), the NNI value lies between NNI values of their integral parts. It is not the case for affricates in the right part of the table, i.e. [p͡f] preceding a front vowel, as in *'**Pf**ifferling'* ('chantarelle'), and [t͡ʃ], as in *'Deu**tsch**'* ('German'). Both demonstrate very low NNI values in both learner groups lying far beneath those achieved by their integral parts. They also exhibit salient backsliding effects, especially [t͡ʃ] (with NNI delta value equaling to as much as 0.27).

3.2.4. Nasal Sonorants

In German, there is one labial (/m/), one alveolar (/n/) and one velar sonorant (/ŋ/), the latter having two allophonic variants: [ŋ] and [ŋʲ] (palatalized phone *following* a front vowel). The [ŋ] might sporadically appear owing to

coarticulation in some Russian words, e.g. *'фу**[ŋ]**кция'* ('funktion'), but Russian native speakers may find it difficult when asked to pronounce it isolatedly (Knjazev & Pozharickaja 2012). Traditionally, German [ŋ] is regarded a *difficult* sound for Russian native speakers.

NNI values achieved by nasal sonorants are tabulated below (see Table 7).

Table 7. Delta NNI values of nasal sonorants across learner groups

	[n]	[m]	[m]_FrV	[n]_FrV	[ŋ]	[ŋʲ]
Beginners	0.96	0.94	0.76	0.71	0.86	0.79
Advanced	0.87	0.84	0.64	0.57	0.49	0.33
Delta NNI	0.09	0.10	0.12	0.14	0.37	0.46

Note. *_FrV* = preceding a front vowel.

The largest NNI values in this class are demonstrated by two-fold aggravated consonants: [ŋ] ("empty cell" in L1), [ŋʲ] ("empty cell" in L1), [n]_FrV (alveolar, palatalization). The left side of the table are one-fold aggravated [m]_FrV (palatalization), [n] (alveolar) as well as the only non-aggravated [m].

3.2.5. Laterals

German has one lateral alveolar phoneme (/l/), whereas in Russian there are two dental phonemes (/l̪ˠ/, /l̪ʲ/). The former is strongly velarized, as was pointed out in (Kodzasov & Krivnova 2001). NNI values achieved by the German lateral are represented below (see Table 8).

Table 8. Delta NNI values of laterals across learner groups

	[l]	[l]_FrV
Beginners	0.79	0.79
Advanced	0.68	0.66
Delta NNI	0.11	0.13

Note. *_FrV* = preceding a front vowel.

As Table 8 shows, beginners are equally good at pronouncing [l] in whichever positions (0.79). The advanced demonstrate a small drop when preceding front vowels (0.68; 0.66). More aggravated [l] in palatalization-prone position demonstrates somewhat more backsliding (0.13 against 0.11).

3.2.6. Glides

German has, just like Russian, one glide: /j/. The sounds of both languages are equivalent. Beginners were exceptionally good at producing it, but the advanced demonstrated a considerable extent of accent (NNI values equaling to 0.99 and 0.78 respectively). Given equivalency of glides in both languages,

articulation basis differences seem to be the major source of backsliding in this case (delta NNI = 0.21).

3.2.7. Vibrants

Russian has two vibrants: /r/ (post-alveolar trill) and /r̪ʲ/ (dental palatalised trill). Modern German has a single uvular vibrant /R/ tending to be pronounced as a fricative [ʁ]. After vowels, the vibrant is vocalized resulting in the [ɐ] sound. NNI values and deltas for this consonant class are to be found below (see Table 9).

Table 9. Delta NNI values of vibrants across learner groups

	[ɐ]	[ɻ̊] _FV	[R]	[ɻ̊]	[R] _FV
Beginners	0.35	0.79	0.99	0.98	0.96
Advanced	0.54	0.46	0.58	0.54	0.45
Delta NNI	-0.19	0.33	0.41	0.44	0.51

Note. *_FrV* = preceding a front vowel.

The above data reveal crucial differences among the learner groups. Beginners tend to mispronounce the vocalised phone – something the advanced are better at (0.35; 0.54), hence the negative NNI delta value. This pattern might reflect complex letter-to-sound rules in German that beginners have yet to master.

As for the rest of the phones, beginners seem to be exceptionally well at pronouncing them. In this learner group, the uvular vibrant ([R]) and the uvular semi-voiced fricative ([ɻ̊]) in non-palatalization environment scored 0.99 and 0.98 respectively, which is impressive given the notorious difficulty of German trills for learners. The advanced learners displayed much lower NNI values, which results in large NNI delta values and signals salient backsliding.

In this class, the greatest NNI delta values were achieved by three-fold aggravated [R] _FV ("empty cell" in L1, palatalization) and [ɻ̊] ("empty cell" in L1, semi-voicedness). Two-fold aggravated [R] ("empty cell" in L1) demonstrates a somewhat smaller NNI delta. Interestingly, the smallest backsliding effects in the class were evidenced in the four-fold aggravated [ɻ̊] _FV ("empty cell" in L1, semi-voicedness, palatalization) being the most aggravated consonant in the entire cross-language comparison.

3.3. Discussion

The purpose of the present study was to investigate phonetical backsliding in non-native German productions of Russian speakers as a function of consonant subclass and position, which was formulated in original hypotheses. The findings of the study did support initial assumptions:

1. The mean NNI value in the advanced group is indeed considerably lower than in the beginners' group (0.62; 0.79) indicating backsliding.

2. The original presumption was that phones with the highest degree of aggravation were likely to display the most salient backsliding effects (associated with large NNI delta values), and vice versa.

The findings reveal two tendencies:

1) More aggravated phones do tend to demonstrate more salient backsliding effects, but there are exceptions;

2) Most cases of negative NNI delta values (no backsliding, i.e. less normativity in the beginners' group) is associated with underlying orthography issues.

Further research could cast more light on backsliding in German-Russian cross-language pair. Below listed are the directions that seem appropriate:

1. A symmetrical study of negative transfer and backsliding effects in Russian speech produced by German native speakers would complete this research and is in progress presently.

2. In general, German sounds absent in Russian trigger more accent than those having an equivalent in it, but there is an extensive "grey area" in between. A typical situation is an alveolar German consonant corresponding to a Russian dental one. In some consonant classes (e.g. stops), this distinction seems to boost backsliding, whereas in others it does not seem to matter much (e.g. fricatives or nasal sonorants). Thus, the notion of aggravation should be further clarified.

4. Conclusion

The main objective of the present study was to investigate factors influencing patterns of normativity and backsliding in German-accented speech produced by Russian native speakers. An experimental sequence containing all German consonant allophones in phonetic positions differing in their "non-normativity capacity" was set up building on cross-language CA and presented to a team of Russian learners of German. The elicited productions were recorded and subsequently checked by a listeners' team for pronunciation normativity. The obtained estimates were then assembled in a table and yielded a numerical measure (Non-Normativity Index, or NNI) enabling different analyses, including comparing German allophones by NNI delta values between the learner groups to evaluate scope of backsliding effects.

Advanced learners demonstrated lower mean NNI values signalling backsliding. The study provided a complete picture of backsliding effects through the entire consonant system of German in both learner groups by comparison. The obtained delta values varied widely across allophones suggesting that backsliding is generally more salient in *difficult* FL (German) allophones. In order to denote this *difficulty*, the notion of allophone aggravation was introduced.

The findings can readily find practical application in FL instruction. Pronunciation teaching within communicative approach has been generally restricted to initial phases of language instruction, while the majority of textbooks has been aimed at a *universal* learner, no matter what their L1 is. Obviously, this approach has proved inefficient. There is a need for new methods of pronunciation teaching that would provide effective tools for suppressing backsliding on all stages of FLA. This means that any course on FL phonetics should be developed for a *specific* L1-FL cross-language pair. Such a new approach would enable FL instructors to concentrate on phonetic issues marked by a high extent of backsliding, leaving out of consideration minor issues.

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