

**VACILLATING SUFFIXES:  
LEARNERS OF HUNGARIAN AND NATIVE SPEAKERS**

BA Thesis Linguistics

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## 1. Introduction

Vowel harmony is a requirement by which vowels in a certain domain agree on one or more phonetic features, making learning these languages a difficulty. It can be found in many agglutinating languages, such as Turkish (Göksel & Kerslake, 2004) and Hungarian (Hall, 1938): in this research, we will focus on the latter. Languages exhibit vowel harmony at different levels (lexicon, morphology, or both) and to different extents: there are two types of vowel harmony, internal, where vowels share one or several of their phonological features within a word stem, and external, where vowel harmony happens between word stems and their affixes (Gonzales-Gomez et al., 2019). As stated above, Hungarian is a language with vowel harmony, where the feature subject to harmony is the horizontal position of the tongue ([± back]). Hungarian vowels fall into three categories: back vowels /u/ /u:/ /o/ /o:/ /a/ /ɒ/, rounded front vowels /y/ /y:/ /ø/ /ø:/, and unrounded front vowels /i/ /i:/ /e/ /e/.

When looking at words in Hungarian, many roots have vowels that are either all front (*öröm* ‘joy’ or *ülés* ‘seat’) or all back (*város* ‘city’ or *autó* ‘car’). As Hungarian suffixes have two forms, the front vowel, and the back vowel version, if a suffix is added to these stems, the backness of it is determined by the backness of the root vowels. In front vowel stems, the suffixes would be with a front vowel, *öröm-mel* ‘with joy’ or *ülés-en* ‘on the seat’. It is the same with back vowels, the back vowel suffixes would be added: *város-ban* ‘in the city’ or *autó-val* ‘by car’.

Disharmonic roots are those where front vowels combine with back vowels, for example, *papír* ‘paper’, *parfüm* ‘perfume’, or *buli* ‘party’. But what happens in this case, do the stems get front or back vowel suffixes? How suffixes are added in the case of disharmonic roots has been described in existing literature as a “serious challenge for linguists to explain” (Benus et. al, 2003). Even more surprising is that there are some disharmonic roots that can pair with both front or back vowel suffixes: these are called vacillating suffixes. Benus et al. (2003) seem to have figured out the rules about suffix vacillation, stating all possible pairings of vowels and the resulting suffix vowel options: these will all be explained later on.

This leads to the general outline of my research, where I will be investigating the usage of vacillating suffixes in Hungarian learners versus native speakers. My specific research question is: Does the choice of alternating suffix morphemes differ between learners of Hungarian and native

speakers? This paper investigates the choice of vacillating suffixes between learners of Hungarian and native speakers using a forced-choice identification task.

After the introduction, Section 2 reviews the literature, and in Section 3 the methods are presented. Section 4 describes the results and Section 5 rounds it off with the discussion and conclusion.

## **2. Literature Background**

### **2.1 Vowel harmony**

Languages differ in how sounds are combined into words to a great extent, and some languages exhibit a phenomenon called vowel harmony. Vowel harmony means that vowels share one or more of their phonological features within a word stem and/or between stems and their affixes, called internal and external vowel harmony respectively (Gonzalez-Gomez et al., 2018). The phonological property shared between the vowels can be palatability, labiality, height, or tongue root position (Van der Hulst, 2016). Others (Finley & Badecker, 2008) have described vowel harmony as a spreading process, where a single vowel will serve as the harmony trigger and will therefore determine the feature of all other vowels in the word. The authors stated that there are two main factors determining the trigger for harmony: directionality and dominance. Directional harmony systems have the leftmost vowel spread its features rightward or the rightmost vowel spread its features leftwards, whereas, in dominant systems, the presence of a vowel with a particular feature value determines the harmony trigger. There are many languages with vowel harmony, some of them are Finnish, Korean, Turkic languages like Kirghiz, Altai, Yakut, and Turkish (Korn, 1969), or Uralic languages like Samoyedic and Hungarian.

The main piece of background literature most useful to this study is an article written by Hayes and Cziráky (2006), where they describe this irregularity of vacillating suffixes in Hungarian phonology. They argue for a unified approach to irregularity, where all competing patterns (here, the possible suffixes) are expressed in a single grammar along with a characterization of their relative strength (developed by Zuraw, 2000). In this article, the authors first categorize the vowels as neutral, front, and back, and express the vowel sequences of words

in formulas employing these abbreviations. The authors here only use the large class of suffixes that show a two-way alternation in backness. They come to the conclusion that vowel harmony depends on the vowels that appear near the end of the stem: this finding agrees with those of others, mentioned earlier. The ‘limited set’ of monosyllabic words that contain no back vowels, yet somehow do get back suffixes is also mentioned, but the authors’ focus is on the most complex examples, where extensive lexical idiosyncrasy can be found: individual stems can require front or back suffixes, or allow both in free variation. Some of the example words mentioned here are part of the stimuli of this experiment. Their findings show that it is not predictable which suffix the stem will take, but there are clear tendencies. After using a query for the vacillating forms of words using the Google search engine, the results essentially showed that “native speaker intuition matches native speaker behavior”. After verifying their query experiment with native speaker consultants, they found that there was agreement between the two types of data collected, justifying that there is no right or wrong answer for vacillating suffixes, but native speakers have an innate intuition when choosing.

Benus et al. in their 2003 article first introduce vowel harmony in Hungarian and then explain the fundamental rule about adding suffixes: the backness of the suffix vowel is determined by the backness of the root vowels. In the case of disharmonic roots, where there are both front and back vowels in the stem, the quality of the root-final vowel is the determining factor when choosing the suffix vowel. Examples of this are /pɔrfym-nɛk/, *parfüm-nek*, ‘perfume’ (dative) and /nyɔns-nɔk/, *nyansz-nak*, ‘nuance’ (dative). The final vowels in these roots, /y/ and /ɔ/ are called opaque vowels, because of their ability to block agreement between the initial and the suffix vowels. However, there are certain vowels that do not block agreement: the authors give the example of /pɔpi:r-nɔk/, *papír-nak*, ‘paper’ (dative) and /ka:ve:-nɔk/, *kávéné-nak*, ‘coffee’ (dative). They call vowels like /i:/ and /e:/ transparent vowels, written /í/ and /é/ in Hungarian orthography.

Benus et al. (2003) also mention a “limited set” of around sixty monosyllabic roots, where vowel harmony does not seem like it is applied: in these cases, front vowels (/i:/, /i/, /e:/) get back vowel suffixes added, for example, /hi:d-nɔk/, *híd-nak*, ‘bridge’ (dative) and /tse:l-nɔk/, *cél-nak*, ‘aim’ (dative). But in the case of polysyllabic roots, a discrepancy emerges between (i:, i, e) and /ɛ/, which the authors call a “systematic difference”. They created a set of rules that can be used for polysyllabic roots suffixation. The simplified formulas and examples are given in the table

below. First, if a back vowel is followed by one of the transparent vowels (/í/, /i/, /é/), the suffix vowel must be back, it cannot be front. But if a back vowel is followed by /e/, vowels of the suffix vacillate between the front and the back version: this means both are correct. Vacillation is also an outcome when a back vowel is followed by two transparent vowels. However, if a back vowel is followed by a transparent vowel and then /e/, the suffix vowel is a front vowel. The authors explain this phenomenon by stating that transparent vowels display a continuum of phonological behavior, the two extremes being full transparency and full opacity. They state that both the number and the quality of the transparent vowels affect suffix selection. Table 1 shows examples of each type.

**Table 1.** Rules for polysyllabic roots suffixations (Benus et al., 2003)

|  | IPA  | Word                                  | Translation  |
|--|--|---------------------------------------|--|
| Back vowel + {i, í, é}<br>= back vowel suffix          | /pɒpi:r-bɒn/, */pɒpi:r-bɛn/<br>/buli-bɒn/, */buli-bɛn/           | papír-ban/*ben<br>buli-ban/*ben       | ‘paper’ (inessive)<br>‘party’ (inessive)                   |
| Back vowel + /e/<br>= vacillation                      | /hotɛl-bɒn/, /hotɛl-bɛn/<br>/a:gnɛʃ-bɒn/, /a:gnɛʃ-bɛn/           | hotel-ban/ben<br>Ágnes-ban/ben        | ‘hotel’ (inessive)<br>‘Ágnes’<br>(inessive)                |
| Back vowel + {i, í, é} +<br>{i, í, é}<br>= vacillation | /ɒspirin-bɒn/, /ɒspirin-bɛn/<br>/oksigɛ:n-bɒn/, /oksigɛ:n-bɛn/   | aszpirin-ban/ben<br>oxigén-ban/ben    | ‘aspirin’<br>(inessive)<br>‘oxygen’<br>(inessive)          |
| Back vowel + {i, í, é} +<br>/e/<br>= front suffix      | */kɒbinɛt-bɒn/, /kɒbinɛt-bɛn/<br>*/novɛmbɛr-bɒn/, /novɛmbɛr-bɛn/ | kabinet-*ban/ben<br>november-*ban/ben | ‘administration’<br>(inessive)<br>‘november’<br>(inessive) |

## 2.2 Learning Hungarian

Hungarian has been said to be one of the most difficult languages to learn, due to the complex structure of the language (Postan, 2021). It is an agglutinating language, which means that the constituent elements of words are fused together: many words consist of little parts, stuck together (Baker & Hengeveld, 2012). Hungarian also has around 18 distinct cases (Archibald, 2021), which are even difficult for native speakers to learn, not to mention that there is no grammatical gender, which might confuse learners of native languages that do have it. The Hungarian phonological

inventory is very rich, with 14 different vowels, nearly twice as many as in English. Osváth (1999) in his paper described the difficulties of teaching Hungarian to Korean speakers. Despite all the distinctiveness of the Hungarian language, it did seem like vowel harmony was a mutual point with the Korean language: whether this makes learning Hungarian easier for Koreans or not necessarily is not described in this article. Therefore, in future research, it would also be interesting to look at whether participants with vowel harmony in their native language perform differently than those without. Perhaps they would make use of the above-mentioned rules of Benus et al. differently.

Sherwood (1999) also shed light on the difficulty of learning Hungarian as a native English speaker. After explaining the history of learning Hungarian in London, he then writes about the grammar of Hungarian: touching on subjects such as vowel harmony, plural formation, possession, conjugations, and the use of personal pronouns. When presenting vowel harmony, he categorizes his description as theory-neutral. The rule he describes has two parts: the first one establishes the fundamental phonological property of any stem, its vowel harmony class. Part two of the rule gives the correct allomorph of any suffix.

### **2.3 Perception studies**

As for previous perception studies, there have not been many that tested vowel harmony in Hungarian. Gonzalez-Gomez et al. 2018 looked at infants' sensitivity to nonadjacent vowel dependencies. They based their research on the fact that toward the end of the first year of life, infants become sensitive to nonadjacent dependencies between segments (van Kampen et al., 2008). But most of the previous research has been done in Turkish, and not Hungarian. Therefore, they investigated at what age Hungarian-learning infants first show sensitivity to lexical (internal) vowel harmony, and then compared these infants with infants of a non-harmonic language, French. Before the actual experiment, two analyses were conducted that measured the prevalence of harmony specifically in the lexicon and in the Hungarian input overall. The first aim was to calculate the percentage of harmonic and non-harmonic forms among all monomorphemic words of at least two syllables to assess the prevalence of harmonic monomorphemic words in the lexicon. Then, the percentage of harmonic and non-harmonic forms among all words of at least

two syllables was calculated, to see the prevalence of harmonic words in the whole input Hungarian infants receive. The analyses showed that vowel harmony in Hungarian is frequent but not without exceptions: altogether, the authors found that the input to young learners of Hungarian is predominantly harmonic but contains a large number of exceptions. These exceptions come both from the lexicon and from non-harmonic morphological derivations. The researchers conducted two experiments, the first one on Hungarian infants of 10 and 13 months of age, and the second on 13-month-old infants from French-speaking families. The infants were tested in a head-turn preference procedure, where they were presented with 24 harmonic and 24 non-harmonic VCV pseudowords combining the front and the back vowels of Hungarian: these phonemes were also shared with the French phoneme inventory. Results showed that the preference for nonharmonic stimuli emerges in Hungarian-learning infants between 10 and 13 months of age. However, 13-month-olds showed a preference for the non-harmonic structures, which is unlike previous results. That is why the second experiment was conducted on the French monolingual infants, where a preference for harmonic stimuli was found in only 8 of the 14 infants. The non-harmonic bias found for the Hungarian infants reflects a language-specific bias and not a language-general preference for the more variable sequences. In conclusion, this study established that sensitivity to vowel harmony emerges in Hungarian infants between 10 and 13 months of age, which stands in contrast to the results of previous studies that found that Turkish-learning infants are already sensitive to vowel harmony by 6 months of age. There are multiple possible reasons for this, the most probable is that this study investigated internal vowel harmony, whereas previous studies looked at external vowel harmony: these two kinds might follow different developmental trajectories.

Taking all previous research into consideration, we can easily establish rules of suffixation for disyllabic words of all vowel structures. The possible vowel structures for disyllabic words are back-back, front-front, front-back, and back-front. These vowel structures and their corresponding suffixes are explained below and can be seen in Table 2.

**Table 2.** Suffixation of disyllabic roots

| Stem                    | Suffix     | Example                                      |
|-------------------------|------------|--|
| Back vowel + back vowel | Back vowel | /va:roʃ-bɒn/, <i>város-ban</i> ‘in the city’ |

|  |                           |  |
|--|---------------------------|--|
| Front vowel + front vowel                  | Front vowel               | /ləvel-bən/ <i>levél-ben</i> ‘in the letter’   |
| Front vowel + back vowel                   | Back vowel                | /vila:g-bøn/ <i>világ-ban</i> ‘in the world’   |
| Back vowel + front vowel<br>Back vowel + ε | Back vowel<br>Vacillating | /pøni:r-bøn/ <i>panír-ban</i> ‘in bread crumbs’<br>/hotel-bøn/, /hotel-bən/ <i>hotel-ban/-ben</i> ‘in the hotel’ |

Back vowel stem words always get back vowel suffixes, as can be seen in examples like /va:roʃ-bøn/, *város-ban* ‘in the city’, or /astal-øn/, *asztal-on* ‘on the table’. Front-front vowel structure stems usually get front suffixes, for example, /ləvel-bən/ *levél-ben* ‘in the letter’ or /iʃten-bən/, *istenben* ‘in God’, however, there are certain exceptions to be found. The words *férfi* and *derék* can get both the front and the back suffixes. In the case of *férfi*, the reason for this lies in the history of the word: originally, the vowel at the end of the word used to be a low, velar /i/, instead of a palatal one, which used to get back suffixes as its production happens further back, as the word also had a final back vowel, /u:/ at the end of it. Over time, the high back vowel disappeared from the end of this word, and the velar /i/ from the Hungarian language altogether, resulting in the usage of only the palatal /i/, which corresponds to the front suffixes. This is the reason why the word /ferfi/, *férfi* ‘man’ can get both the front and the back vowels in the Hungarian language (e-nyelv, 2013). The usage of the front and back suffix, in this case, might vary among people, or even just one person may use both interchangeably, or its usage might depend on the context of speech. However, it is interesting to note that the public media has decided to only employ one variation of the word: only the back vowel suffix is used (e-nyelv, 2011). Just out of curiosity as to which format people choose in this case, and whether there is a difference between learners and native speakers of Hungarian, this word has been added as a target word, making it the only one that does not have a front-back vowel structure.

Word stems with one front and one back vowel usually always get the back vowel suffix, like the words /dia:k-bøn/ *diák-ban* ‘in the student’ or /vila:g-bøn/ *világ-ban* ‘in the world’. And finally, word stems with one back and one front vowel might get vacillating suffixes. However, not in all cases: as previous studies have mentioned (Benus et al, 2003), this only happens if a back vowel is followed by the open-mid front unrounded vowel, ε, therefore, most of the target words are made up of this structure. There was one word, however, which can also be used with both

suffixes and its structure is a back vowel paired with a long, close-mid front unrounded vowel, /e:/.

As mentioned before, vowel harmony in Hungarian is also closely related to sound change, such as in the case of the word *férfi* ‘man’, where the last back vowel of the word got deleted, making it possible today to use both front and back vowel suffixes. However, in general, there is not a lot of literature covering this topic of sound change in Hungarian. The most prominent part of the historical change of this language is the velar /i/, described as similar to regular /i/, but pronounced with a retracted tongue, and when categorizing it, it belongs to the back vowels. The velar /i/ is present in most Finno-Ugric languages and also in languages like Russian and Romanian. It was a phenomenon in the Hungarian language for a long time, but after the Hungarian conquest of the Carpathian Basin (in 895), it has shifted over to the /i/ used today, the palatal /i/. However, it has not disappeared without a trace: even today it can be seen which words used to have velar /i/ by the suffixes they take: these words still take back vowel suffixes. Examples for this are /si:v/ *szív* ‘heart’ which sometimes take front suffixes /si:v-ek/ *szívek* ‘hearts’, or back vowel suffixes /si:v-ok/ *szívok* ‘I suck’ (Balassa, 1930).

All of these background studies still do not show a clear rule as to when people use which suffix option: this research aims to fill this gap in the literature.

## 2.4 Predictions

The predictions differ for the two participant groups. The prediction for the Hungarian learners is that no matter what suffix they choose, it would be uniform as language teachers most probably would use the same rules and reasoning when teaching this part of the grammar and therefore participants would learn it the same way. But, if there are any words they might not know, they might click randomly, which would influence the results. If there were to be any discrepancies, those could also be accounted for by investigating whether the participants’ native languages have vowel harmony. That is, learners of Hungarian who have a native language with vowel harmony may perform differently than those without. Another possibility for different answers might be

based on participants' level of Hungarian: how long they have been learning the language might also play a key role in this.

For the native speakers, the prediction is that their results would differ from each other. There are many possibilities why their answers might differ from each other: their choice might depend on how old they are, the region they're from, what other languages they speak or even their gender might be an influencing factor. Since there is not a lot of background literature covering this exact topic, it is difficult to say what the reason behind discrepancies might be. It also might be the case that since both forms of the target words sound normal and grammatical to them, their choices among the five repetitions would differ: this would support the claim that both forms are well-known to native speakers. Then, the ratio of front and back vowel suffix answers and within-participant variation should be investigated further.

### **3. Methods**

#### **3.1 Participants**

Two groups of participants took part in the experiment: the first group consisted of 12 native Hungarian speakers, all born and raised in or near the capital of Hungary, Budapest. This was to ensure that the different dialectal variations across the country would not play a key role in this research. The other group was made up of 7 participants learning Hungarian as a foreign language. These participants were of many different native languages, namely Arabic, French, Khmer, Persian, Spanish, and Urdu. All participants were adults, aged 18-40, and were recruited through the contacts of the experimenter and through different platforms of social media. None of the participants reported any language disorders or impairments that would have compromised their participation.

#### **3.2 Stimuli**

In the task, 10 target, and 10 filler words (see Table 3) were presented with two possible suffix choices. All pairs of words were repeated five times in order to make sure that participants were

not clicking randomly and actually were paying attention and to gather enough data for it to be applicable.

The 10 target words were words with vacillating suffixes, where both the front and the back vowel suffix would be grammatically correct, chosen from the large class of suffixes that show a two-way alternation in backness. They were chosen through careful investigation of earlier literature discussing this topic, while also making use of various articles, websites, and the researcher's own experiences with the Hungarian language. These target words can be seen in the table below, categorized with their vowel structures and next to them, their English translations. It is important to note, that only disyllabic words were used for both the target and the filler words. The main reason for this is that we wanted to exclude monosyllabic words, as they cannot have vacillating suffixes added to them, as they would be noticeably ungrammatical. Trisyllabic words could have been used in this experiment, but they did not differ in their vowel structure, as all of them were of back-front-front vowel structure. There were not many trisyllabic words with vacillating suffixes to be found either, so our focus shifted onto the disyllabic words.

As for the suffixes used in the stimuli, the cases of them varied: there were filler and target words with both inessive (for example /dʒuŋgɛl-bɒn,-bɛn/, *dzsungel-ban/-ben*, 'in the jungle') and instrumental cases (/slɔvɛn-nal, -nɛl/, *szlovén-nal/-nel*, 'with the Slovene'). This variation was used to avoid monotonicity, and in the case of the target words, to use the suffix cases where it would sound the most normal with the possible vacillations. Essentially, the target words were words with multiple correct suffix possibilities, in contrast to the filler words.

The 10 filler words only had one correct form, and could not be deemed grammatically correct with the other suffix form. For example, /pɒpi:r/ *papír* 'paper' can only combine with the back vowel suffix: *papír-ban*, *\*papírben*. This is also to test that participants know the rules of suffixation in Hungarian and are not clicking randomly. All of the filler words were disharmonic roots, whereas there was one harmonic root among the target words: this, however, should not have an effect on the results, as the target words can bear both types of suffixes. The filler words were chosen in a way to ensure that the Hungarian learners would be familiar with them and that they were words that they would most probably already know and most probably know how to add suffixes to, and they are presented in the table below similarly to the target words, with their

syllable and vowel structure. The target words will not necessarily be known to the learning group participants as some of the words may not be the ones taught during a language course. If any of the words (target or filler) were unknown to the participants, they were instructed to choose the form they think sounded or looked correct, and to try and not change their answers.

**Table 3.** Structures and translations of target and filler words

| Target words             |             |                           |     | Filler words             |        |                          |           |
|--------------------------|-------------|---------------------------|-----|--------------------------|--------|--------------------------|-----------|
| back vowel - front vowel |             | front vowel - front vowel |     | back vowel - front vowel |        | front vowel - back vowel |           |
| Anett                    | female name | férfi                     | man | buli                     | party  | diák                     | student   |
| Ágnes                    | female name |                           |     | játék                    | game   | illat                    | scent     |
| dzsungel                 | jungle      |                           |     | káv                      | coffee | István                   | male name |
| fotel                    | armchair    |                           |     | papír                    | paper  | leány                    | girl      |
| haver                    | buddy       |                           |     | radír                    | eraser | világ                    | world     |
| hotel                    | hotel       |                           |     |                          |        |                          |           |
| mágn                     | magnet      |                           |     |                          |        |                          |           |
| póker                    | poker       |                           |     |                          |        |                          |           |
| szlovén                  | Slovene     |                           |     |                          |        |                          |           |

### 3.3 Procedure

The experiment was a survey programmed in the Qualtrics software and took around 15 minutes. First, participants were presented with the information brochure and were asked to consent to participate and for their data to be stored in the consent form (see both forms in Appendix). Before the actual experiment part, participants were asked to fill out a competency language background questionnaire. For native speakers, this consisted of their age, occupation, and the city they grew up in. For the group of Hungarian learners, they were asked to fill out their age, occupation, native language, where they are from, and what level they are at in the Hungarian language. All of this information is necessary to find out whether there is a difference between the learners' different levels and to see whether their native languages influence their choices. After the language background questionnaire, the actual experiment part could begin, where the participants were presented with the 20 pairs of suffixed words through the forced-choice identification task, where all words were repeated five times. Once they had finished choosing between all of the pairs

repeated, the experiment had come to an end, and participants were thanked for their contribution to the research.

### **3.4 Data Analysis**

The design of this study is a 2x2 design, where the binary independent variables were native speakers versus foreign natives, and the dependent variables were their choice of answers to the target words. When analyzing the data, the most important information was the two participant groups. Then, each participant's answers were checked separately. First, their number of correct answers on the filler words, and then the same for the target words. It was also made sure that their answers were consistent, i.e. did not differ throughout the repetitions. This is especially important in the case of vacillating suffixes (the target words) because if there were irregularities, it would support the fact that the vacillating suffixes are interchangeable and already differ within participants.

## **4. Results**

Based on the hypothesis and predictions established in the earlier sections, the expectations are quite broad, especially for the native speakers. For this group of participants, they are expected to give different responses to each other to the target words. For the Hungarian learning group, it is expected that their answers will be more uniform, as they probably are taught suffixation a certain way.

Altogether, 19 people have filled out the online survey, which was presented on the Qualtrics platform. The native languages of the learners' group were: Arabic, French, Khmer, Persian, Spanish, and Urdu. Their levels ranged from A1 beginner to C1 advanced. All of the native Hungarian speakers were from either the capital or grew up right next to it on the outskirts. This is important to mention, as people from all around the country might be influenced in their answers by their different dialects: therefore, only natives from the capital were used.

## 4.1 Native group

### 4.1.1 Filler words

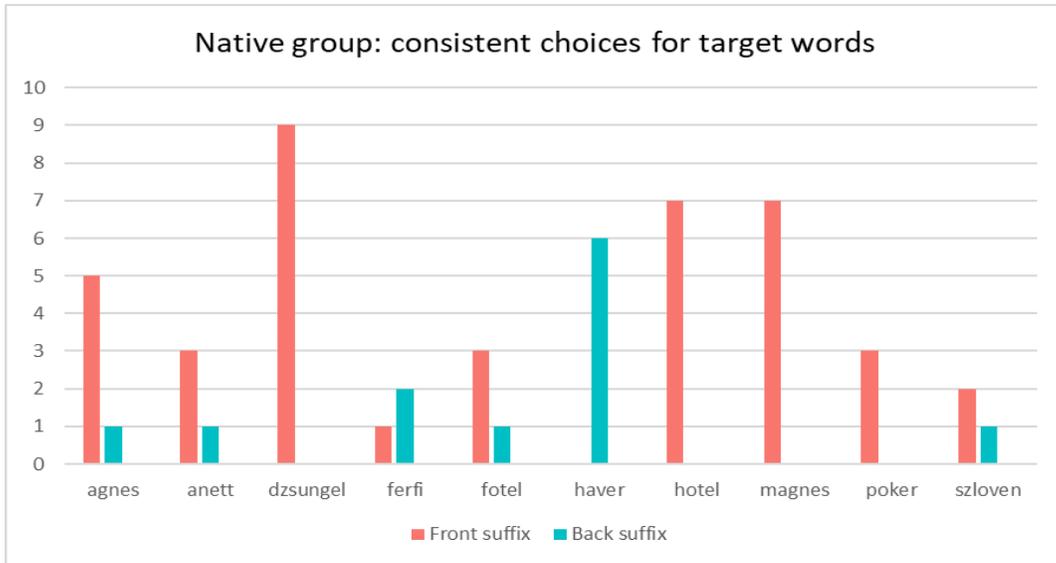
As expected, all native speakers of Hungarian have chosen the correct suffixes for the filler words. This is a good indication that they were paying attention and were not clicking randomly. Adding the correct suffixes to non-vacillating suffix words is a simple and easy task for a native speaker, as the incorrect suffix would be very strikingly wrong.

### 4.1.2 Target words

Altogether 12 native Hungarians have taken part in the online survey. Each of them had to respond to 10 target word questions, 5 times, resulting in 50 responses per person, 600 altogether. Out of the 600 responses, 396 were to front suffix options, and 204 to back suffix options, resulting in a rough 66 to 33 % ratio, meaning that native speakers choose front vowel suffixes 2 out of 3 times, even when both suffixes are grammatically correct.

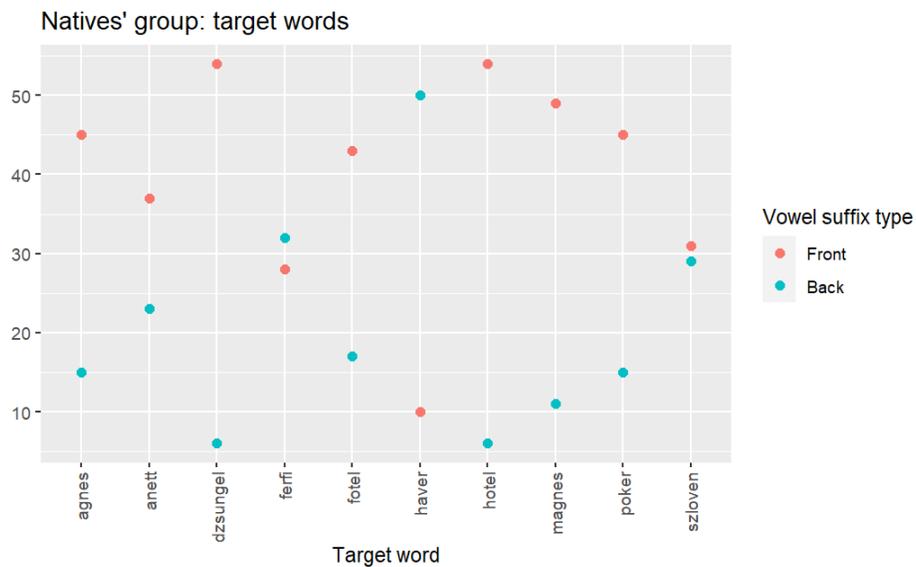
However, we must examine those choices more carefully when participants agreed with themselves and chose the same suffix option all five times: let us call this phenomenon a ‘consistent choice’. When looking at the words with consistent five clicks only, for 41 words participants all five times chose the front vowel option. Only for 12 words have participants continually chosen the back vowel suffix possibility.

Looking at the words with consistent choices, all of them had at least one time, where at least one participant was always choosing the same suffix. Some words had even more: for *hotel*, 7 participants were sure that it would get a front vowel suffix, just as in the case of *mágnés*. The word with the most choices was *dzsungel*, here 9 out of 12 participants chose the front vowel suffix all five times. 4 out of the 10 target words had only front vowel suffixes as consistent choices, 1 had a back vowel suffix, and 5 had both front and back vowel suffix options as consistent choices. This goes to show that in half of the cases, participants’ answers varied between suffix choices and that they were unsure which suffix would be correct. Results of the consistent choices can be seen in Figure 1. Here, the target words are presented in alphabetical order, and the front suffix choices are indicated with red and the back suffix choices with blue coloring.



**Figure 1.** Native group: consistent choices

Figure 2 shows all of the front and back choices for the target words for the native group. The target words are again alphabetically ordered, and the color indication is the same as earlier. Each word and its front and back choices can be seen in this chart, and the differences between the words as well. For example, for the words *hotel* and *dzsungel*, participants were leaning towards the front vowel suffix, whereas in the cases of *férfi* and *szlovén*, the answers of front and back were more proportional.



**Figure 2.** Results of natives' group: target words

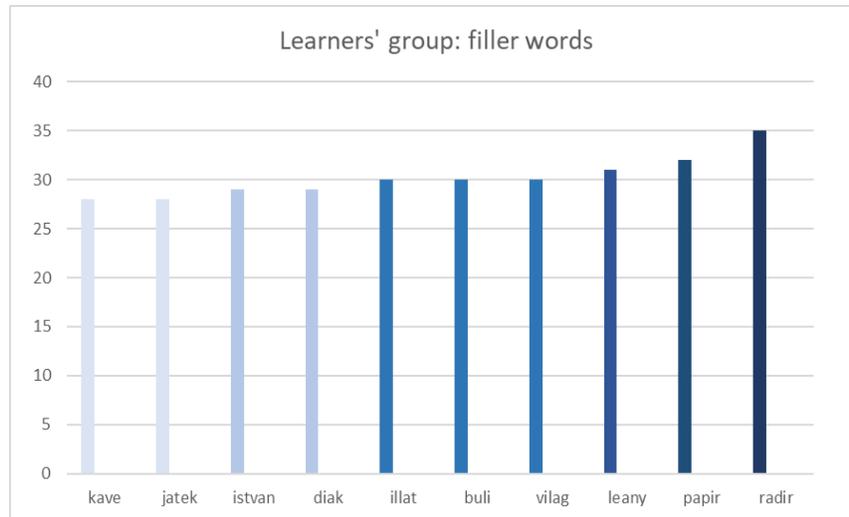
In conclusion, native speakers of Hungarian between the ages of 18 and 40 prefer front vowel suffixes to back vowel suffixes 2 out of 3 times, as they had a ratio of 66 % to 33 %. There were more words with front vowel choices, however, one word only got the back vowel suffix as consistent clicks. But the fact that there was no word, where all participants would have agreed on the choice of suffixes, shows that vacillation is very much a present phenomenon in the Hungarian language.

## 4.2 Learners' group

### 4.2.1 Filler words

Looking at the answers to the filler words, there is a clear difference between participants. Four of them had 100% correct answers to the filler words, another almost perfect score of 90%, one of them an 82% accuracy, and the last one 38%. It is interesting to note that three participants had marked themselves as a beginner, on levels A1-A2, and one of them had a perfect score on the filler words, while the other two had the lowest scores. The other three perfect scores are the most advanced learners, who have been studying Hungarian for more than 3 years, categorizing themselves as B1-B2 and C1-C2 level learners.

Altogether, the average correct answers out of the 350 filler words (10 filler words \* repeated 5 times \* among 7 participants) were 305, making the average scores for filler word accuracy 87,1%. The filler word with only correct answers was *radír*, where all seven participants, all five times put the correct suffix. The two filler words with the least accuracy (28 out of the 35 times) were *játék* and *kávét*. Perhaps the two accents on both vowels confused the participants, therefore choosing the wrong suffix in some cases. But it is still important to mention that as average scores, 28 out of 35 is still 80%, which can be regarded as good knowledge of Hungarian suffixation rules. The results of the learners' filler words can be seen in Figure 3 below, where the darker color indicates the higher scores.



**Figure 3.** Results of learners' group: filler words

#### 4.2.2 Target words

As for the target words, there were many differences between the participants of the learners' group. There was one participant who favored the front vowel suffixes, choosing them 46 times out of 50. Another participant preferred the back vowel suffix, clicking on the back vowel suffix target words also 46 times out of 50. Other participants' scores varied, i.e. 38-12, 11-39, 45-5, and 37-13, where the first number shows the number of times they chose the front vowel suffix, and the second number represents their back vowel suffix answers. Altogether, out of all the participants' 350 answers (=10 target words \* 5 repetitions \* 7 participants) to the target words, 207 times they chose the front, 143 times the back suffix options, which equals 59% and 41%, resulting in close outcomes to the native group, just a bit more even. Figure 4 below shows the results, where the colors red and blue indicate front and back vowel suffix choices respectively.

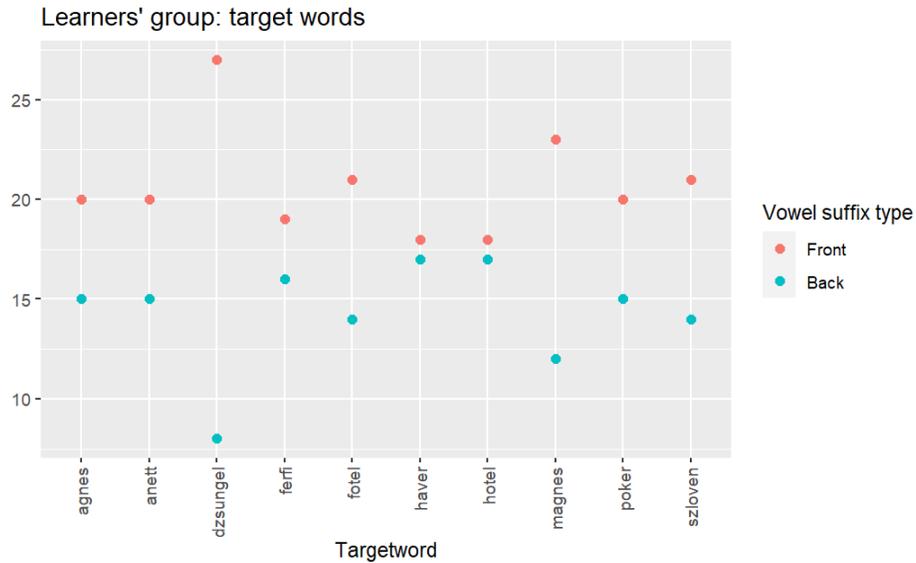


Figure 4. Results of learners' group: target words

### 4.3 Comparison

When comparing the results of the native group with the learners' group, it is clear that both groups prefer front suffixes over back suffixes. Looking at the individual words alone, for example, *haver*, where natives mostly chose the back vowel, it is interesting to see that learners have chosen both vowels almost equally (18 times the front, 17 times the back suffix). The words *dzsungel* and *hotel* had the highest rate of front choices in the native group. The learners' group agreed with the front suffix for *dzsungel*, choosing it 27 times out of 35, but for *hotel*, their results were more balanced out, having a 51-49 % ratio. To summarize, both groups lean toward the front suffixes, but the learners' group is more open to choosing the back suffixes in more cases than the native group.

## 5. Discussion and conclusion

Based on the previous literature on the topic of vowel harmony and free variation, there have not been many sufficient or clear results because it was difficult to evaluate what choices to expect from the participants. This paper aimed to fill this gap. Earlier studies have come to the conclusion

that there is no right or wrong answer for vacillating suffixes, but native speakers have an innate intuition when choosing. After conducting a forced-choice identification task between native speakers of Hungarian and learners of Hungarian, where they had to choose between front and back vowel suffix options, the results show that both groups prefer front suffixes where front and back are both possible. The native group leans more strongly toward the front suffix options, having a 66:33 front to back suffix ratio, while the learners' group has a more balanced ratio of 59% front suffix and 41% back suffix choice. The results of this paper support earlier findings, as both groups have chosen both suffixes most of the time, but native speakers clearly leaned more towards the front suffix options.

Suggestions for future research based on this study include the possibility to extend the design of the study: to use target words that match the participants' level of knowledge of the Hungarian language. Perhaps learners in the early stages do not know all of the words, therefore, it would be logical to match proficiency with the level of the word, or maybe the frequency of the word. Another point of improvement would be to gather more participants from both groups. In this experiment, the ratio of natives versus learners was not equal: this problem could be solved by having the same number of participants in each group, as many as possible to make the study reliable. A proposal for future studies would be to conduct a similar experiment but only use Hungarian learners who have vowel harmony in their native language as well, as the results might differ from those of this study. Perhaps Finnish, a language quite close to Hungarian would be a great option to compare to Hungarian, as it is from the same language family and also has vowel harmony: maybe native Finnish speakers learning Hungarian have different perceptions of which suffixes would work best with the target words.

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## Appendix

### Informed consent form

‘I hereby declare that I have been clearly informed about the research project “Vacillating Suffixes: Language Learners of Hungarian and Native Speakers” at the University of Amsterdam, Faculty of Humanities, conducted by Cecilia Suha under supervision of Suki Yiu as described in the information brochure. My questions have been answered to my satisfaction.

I realise that participation in this research is on an entirely voluntary basis. I retain the right to revoke this consent without having to provide any reasons for my decision. I am aware that I am entitled to discontinue the research at any time, and that I can withdraw my consent at any time after the research has ended. If I decide to stop or withdraw my consent, all the information gathered up until then will be permanently deleted.

If my research results are used in scientific publications or made public in any other way, they will be fully anonymised. My personal information may not be viewed by third parties without my express permission.

If I need any further information on the research, now or in the future, I can contact Suki Yiu (e-mail: s.y.yiu@uva.nl; Spuistraat 134, 1012 VB Amsterdam).

If I have any complaints regarding this research, I can contact the secretary of the Ethics Committee of the Faculty of Humanities of the University of Amsterdam; email: commissieethiek-fgw@uva.nl; phone number: +31 20 – 525 3054; Kloveniersburgwal 48, 1012 CX Amsterdam.

I consent to:

- participate in this research    yes / no
  
- my personal details to be stored for a period of 10 years    yes / no

Signed in duplicate:

.....

Name participant

Date

Signature

‘I have explained the research in further detail. I hereby declare my willingness to answer any further questions on the research to the best of my ability.’

.....

Name researcher

Date

Signature

## Information brochure

Information brochure for

### *VACILLATING SUFFIXES: LEARNERS OF HUNGARIAN AND NATIVE SPEAKERS*

Dear participant,

You will be taking part in the “*Vacillating Suffixes: Learners of Hungarian and Native Speakers*” research project conducted by Cecilia Suha under supervision of Suki Yiu at the University of Amsterdam, Faculty of Humanities. Before the research project can begin, it is important that you read about the procedures we will be applying. Make sure to read this brochure carefully.

#### Purpose of the research project

Over the course of this research, we will be attempting to find out whether there is a difference in the choice of suffixes between foreign language natives learning Hungarian and native speakers of Hungarian.

At this stage of the project, we cannot provide any further information on the factors we will be examining. You will receive further details after the experiment has ended.

#### Who can take part in this research?

We are inviting adults ages 18-25, learners of Hungarian as a foreign language, as well as native speakers of Hungarian, who are both welcome to take part in the experiment. Before the experiment begins, we will be asking you some questions about your language background in

Hungarian. You can take part in this research project if Hungarian is your mother tongue or if you are learning Hungarian as a foreign language. We also need to make sure that you do not, to the best of your knowledge, have any language problems such as dyslexia or a specific language disorder.

### Instructions and procedure

Before the procedure, you will be asked to fill out a questionnaire including questions about your background in the Hungarian language. Once this part is all filled out, you will start the experiment part. You will be presented with two suffixed words and will be asked to choose the one you would use in speech or writing, and think is grammatically correct. After you picked the one you think is correct, you move on to the next pair of words. You will see twenty questions like this altogether. If by any chance, you do not know the exact meaning of the word or are not familiar with it, you are asked to choose the one you think would sound or look the most correct. After you finished all twenty pairs of words, you will be done with the experiment. The total duration of the experiment will be between 10 to 20 minutes.

### Voluntary participation

You will be participating in this research project on a voluntary basis. This means you are free to stop taking part at any stage. This will not have any consequences and you will not be obliged to finish the procedures described above. You can decide to withdraw your consent at any time later on. If you decide to stop or withdraw your consent, all the information gathered up until then will be permanently deleted.

### Discomfort, Risks & Insurance

The risks of participating in this research are no greater than in everyday situations at home. Previous experience in similar research has shown that no or hardly any discomfort is to be expected for participants. For all research at the University of Amsterdam, a standard liability insurance applies.

#### Confidential treatment of your details

The information gathered over the course of this research will be used for further analysis and publication in scientific journals only. Your personal details will not be used in these publications, and we guarantee that you will remain anonymous under all circumstances, unless you explicitly provide consent to share your personal information.

The data gathered during the research will be encrypted and stored separately from the personal details. These personal details and the encryption key are only accessible to members of the research staff. Anonymous data will be stored for a period of 10 years. The personal data will only be stored as long as is necessary for the research and will be deleted as soon as possible, unless you explicitly provide consent to store it for a longer period. You can provide such consent on the informed consent form if you wish to do so.

#### Further information

For further information on the research project, please contact Suki Yiu (email: [s.yiu@uva.nl](mailto:s.yiu@uva.nl); Spuistraat 134, 1012VB Amsterdam).

If you have any complaints regarding this research project, you can contact the secretary of the Ethics Committee of the Faculty of Humanities of the University of Amsterdam, [commissie-ethiek-fgw@uva.nl](mailto:commissie-ethiek-fgw@uva.nl), phone number: +31 20 – 525 3054; Kloveniersburgwal 48, 1012 CX Amsterdam.