Filozofická fakulta Univerzity Palackého
Katedra anglistiky a amerikanistiky

The function of glottalization in the prosodic structure of Czech and English (research proposal)

(bakalářská práce)

Autor: Jakub Bortlík, Anglická a německá filologie

Vedoucí práce: Mgr. Šárka Šimáčková, PhD.

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Prohlašuji, že jsem tuto bakalářskou práci vypracoval samostatně a uvedl úplný seznam citované a použité literatury.

V Olomouci dne ....

Vlastnoruční podpis

Poděkování:

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Contents

1 Introduction

Glottalization means in a broad sense "to articulate [a sound] or accompany the articulation [of it] with whole or partial glottal closure."[1] The research into this phenomenon so far has proven "a tendency toward wide variation in rate of occurrence and in preferred acoustic characteristics across languages, dialects, individual speakers and phrasal position."[2] The present work discusses some of the aspects of glottalization in Czech and English, among others it discusses the degree to which glottalization has been studied in the languages according to its role in their prosodic systems. Some kind of a glottal gesture[3] is a feature known both in Czech and in English. But there are significant differences in the way speakers of Czech and English use it. These differences can be determined theoretically by comparing the phonetic and phonological systems of the two languages, but they can also become evident when the native speaker of one of them speaks or listens to the other one as a foreign language. Some aspects of the glottalization in the so-called Czech English have been examined by Volín[4] who, under restricted conditions, demonstrated the excessive use of word-initial glottal stops by advanced Czech learners of English in comparison with native speakers. He also suggested that "future research should ascertain whether [this] is a stable feature of Czech English and specify the probabilistic characteristics of its occurrence."[5] No similar treatment of English, American, etc. Czech (i.e. Czech as a foreign language spoken by native speakers of English) is available but at the same time a more detailed research has been carried out on the prosodic function of glottalization in English by Dilley et al.,[6] which has no equivalent in the work on glottalization in Czech. We would like to attempt such an interlingual comparison by combining the conclusions of the research by Volín and Dilley et al. The comparison will be based on a comprehensive overview of the

1 "Glottalization," def. Webster's Third New International Dictionary of the English Language Unabridged, 1993 ed.

2 Laura Redi, and Stefanie Shattuck-Hufnagel, "Variation in the Realization of Glottalization in normal speakers," Journal of Phonetics 29 (2001): 412.

3 The appropriateness of the term "glottal stop" will be discussed later on in the text.

4 Jan Volín, "The Proposition 'of' and Glottal Stops in Czech English," Prague Conference on Linguistics and Literary Studies Proceedings, ed. A. Grmelová and M. Farrell (Praha: UK PedF, 2003) 10-19.

5 Volín, "The Preposition" 17.

6 L. Dilley, et al., "Glottalization of Word-Initial Vowels as a Function of Prosodic Structure," Journal of Phonetics 24 (1996): 423.

available literature and it is supposed to result in a proposal of a specific phonetic research that could shed some more light on the topic. The main problem in this aim will be a careful control of the factors that influence the phenomenon since quite many variables seem to play a part in it. A brief look into some past research shows clearly the complexity: "The factors which contribute to gender differences in rate of glottalization may be anatomical, sociolinguistic, structural, or perhaps a combination."[7] Redi & Shattuck-Hufnagel further consider the role of phrasal position, segmental context, dialect and last but not least variation with individual speakers.[8] Taking the interlingual factor into account makes the matter even more complicated. But while keeping in mind that only a part of the problem can be solved in a study like the present one and with the aid of earlier findings it shouldn't be impossible to make at least a small contribution to the understanding of this phenomenon.

2 Glottalization in Czech

2.1 Previously described types of glottalization

The term "glottalization" was not used very frequently in Czech linguistics until about 2003. According to Volín it was *sometimes* applied to "[u]sing the glottal stop and various other perceptually equivalent glottal gestures."[9]

2.1.1 Glottal stop

In the IPA the glottal stop is represented by the symbol /ʔ/. Gimson's definition of the *canonical glottal stop* describes it as a plosive by that "the obstruction to the airstream is formed by the closure of the vocal folds, thereby interrupting the passage of air into the supraglottal organs. The air pressure below the glottis is released by the sudden separation of the vocal folds."[10] Its auditory manifestation is silence that may either suddenly interrupt the preceding sound or cause "the sudden onset [. . .] of the following sound."[11] The glottal stop is usually considered to be voiceless[12] as a

7 Redi & Shattuck-Hufnagel 409.
8 Redi & Shattuck-Hufnagel 408-410.
9 Volín, "The Preposition" 12.
10 Alan Cruttenden, ed. Gimson's Pronunciation of English 5th ed. (London: Arnold, 1994) 154.
11 Cruttenden 154.
12 E.g. Bohuslav Hála, Uvedení do fonetiky češtiny na obecně fonetickém základě (Praha: ČAV, 1962) 359.

necessary result of the fact that the vocal folds are not vibrating. Ladefoged[13] for instance lines it up with the other three voiceless plosives /p, t, k/ in English. However, an alternative view exists: since the vocal folds are neither vibrating nor wide open (which is their position with other voiceless sounds) the glottal stop itself is neither voiced nor voiceless.[14] For Kent the glottis being shut makes the "laryngeal dynamics of the sound [. . .] *rather* (emphasis added) like those of voiced stops."[15] Nevertheless, both in English and in Czech it shares other characteristics of the voiceless sounds, namely some aspects of the phonological behaviour. In English, in which some dialects it substitutes for /p, t, k/, "it has the usual effect of voiceless plosives in shortening preceding vowels."[16] "In Czech [on the other hand] it causes assimilation of voicing: *zasaď břízku*: ['zasaďʼbři:sku], *zasaď smrček*: ['zasaťʼsmrček], *zasaď osiku*: ['zasaťʼʔosiku]."[17]

However, this canonical kind of the glottal stop is not the only one used by many speakers[18]. Skarnitzl[19] was the first to systematically apply the latest findings of (mostly) American linguists (among others Huber, Dilley, Shattuck-Hufnagel, and Redi[20]) in the description of the glottalization in Czech and in the course of his own research he adapted their elaborate conception and terminology (e.g. creak, creaky voice, diplophonia etc.[21] vs. his own glottal stop with flatulence, barbell glottal stop, etc.[22]). Until then most works on Czech phonetics and phonology would basically do without the term glottalization, which was, of course, mainly due to the lack of the latest knowledge of the varied and complicated matter. Out of the variety of phenomenons that are now generally understood as covered by the notion of

13 Peter Ladefoged, A Course in Phonetics, 3rd ed. (Fort Worth: Harcourt Brace, 1993) 52.
14 Cruttenden 154.
15 Volín, "The Preposition" 12.
16 Cruttenden 154.
17 Volín "The Preposition" 13.
18 Volín "The Preposition" 12.
19 Zdena Palková, et al., "Stabilizace některých termínů pro fonetický popis češtiny v závislosti na nových výsledcích výzkumu," Sborník z Konference česko-slovenské pobočky ISPhS 2004, ed. Tomáš Duběda (Praha: UK FF, 2004) 71-73.
20 Cf. Radek Skarnitzl, "Acoustic Categories of Nonmodal Phonation in the Context of the Czech Conjunction 'a'," AUC Philologica 1 – 2004. Phonetica Pragensia X, ed. Zdena Palková and Jitka Veroňková (Praha: Karolinum, 2004) 57-68.
21 Skarnitzl, "Acoustic Categories" 58.
22 Radek Skarnitzl, "Acoustic Properties of the Glottal Stop before the Czech Conjunction 'a'," Speech Processing: 13th Czech-German Workshop, ed. Robert Vích (Praha: IREE AS CR, 2004) 73-74.

glottalization it was traditionally almost exclusively the *prevocalic glottal stop*[23] that was described in Czech linguistics (in descriptive as well as in prescriptive texts). Some attention, though, was also paid to an equivalent of the *breathy voice*[24], as will be shown later.

2.1.1.1 "Ráz" vs. glottal stop?

From the first half of the 20th century onwards scholars debated the subject of what the glottal stop should be called in Czech. This uncertainty is still apparent in the fact that the term "ráz", which has gained the widest acceptance, has been since its introduction in 1909[25] until now quite often used with the "hesitant" attribute "*tzv.* ráz"[26] This may well reflect the uncertain status[27] of the glottal stop in Czech itself.

A recent contribution to the Czech phonetic terminology is the proposal to use the word "ráz" more broadly as an umbrella term for various glottal manifestations of the border signal that in Czech appears usually in front of a vowel.[28] "Ráz" would then cover glottal stop, creak, breathy voice, etc. but it would be only partially equivalent to "glottalization", since it is defined mainly by its function, whereas glottalization usually only refers to the articulatory technique. For the glottal stop a more explicit name "hlasivková explozíva"[29] is suggested.

2.1.2 Subtypes of the glottal stop in Czech

It has been already mentioned that there is not just one way to produce a glottal stop. And whereas some of its less canonical variants are still considered to be subtypes of

23 Cf. especially Hála's coinage "předraz" in which he purposely suggested the typically *pre-*vocalic occurrence of the glottal stop in Czech. Hála, Uvedení 359. Zdena Palková, Fonetika a fonologie češtiny: S obecným úvodem do problematiky oboru (Praha: Karolinum, 1994) 55, 325. Jiřina Hůrková, Česká výslovnostní norma (Praha: Scientia, 1995) 25.

24 Hála, Uvedení 360. Palková, Fonetika 56.

25 The term "ráz" was introduced by Frinta, the name could even differ according to the profession by which the glottal stop was described, singers would call it "pevné nasazení" ("firm onset" a loan translation from German), physiologists would use "tvrdý hlasový začátek" ("hard voice onset"). Hála, Uvedení 359.

26 "So-called glottal stop" in Czech, cf. Hála 359. Palková, Fonetika 55. and Ilona Pavelková, "K tzv. rázu v češtině," Jazykovědné aktuality: Informativní zpravodaj českých jazykovědců 38.4 (2001): 78-83.

27 "Jinými slovy, [. . .] ráz představuje v systému fonologických hodnot současné spisovné češtiny jistý 'nejasný bod' [. . .]." Josef Vachek, Dynamika fonologického systému současné spisovné češtiny (Praha: Academia, 1968) 125.

28 Palková, et al. 71.

29 Cf. Palková, et al. 71-72. "Hlasivková explozíva" literally means "glottal plosive" in Czech and it was proposed already by Chlumský. Hála, Uvedení 359.

it, others differ in such an extent that they deserve special names. A detailed taxonomy has been developed to capture the relevant subtleties and differences. In his study on the nonmodal phonations Skarnitzl examined 12 Czech newsreaders concerning the glottalized pronunciation of the conjunction "a".[30] Apart from the nearly negligible appearance of breathiness[31] and the prevalent tokens he regarded as *creaks* (which will be dealt with in their own chapter), he also defined four types of the glottal stop as relevant in the sample under scrutiny. Further research will show whether exactly these four categories apply also in other circumstances (e.g. with nonprofessional speakers, within different speech styles, etc.[32]) but they can be taken as a starting point in this paper to show the possible and already proven diversity of glottalization in Czech.

2.1.2.1 Additional specification of the canonical glottal stop

Skarnitzl's definition of the glottal stop (Fig. 1.[33]) does not deviate substantially from that given by Gimson as quoted earlier in this text. He extends the definition by placing the stop at "the *closed* (emphasis added) extreme of the phonation continuum"[34] in whose middle lies the modal voicing (that can be found for instance in sustained vowels), while in the other extreme the vocal folds stop vibrating because of their being too much separated. He calls the silent part the *hold phase*. And as an important clue how to tell a glottal stop from other types of glottalization he takes the analysis of the waveform of the segment into account that must contain one or two (but not more) pulses of irregularity.[35]

30 Skarnitzl, "Acoustic Categories" 59.
31 Skarnitzl, "Acoustic Categories" 59.
32 The speech material consisted of radio news read by professionals where greater inclination for comprehensibility (and thus the recommended usage of the glottal stop) can be expected. Skarnitzl, "Acoustic Categories" 59. Cf. also the author's own caution while interpreting some findings with only a small number of tokens analysed. Skarnitzl, "Acoustic Properties" 77.
33 Skarnitzl, "Acoustic Categories"60. Figures 1-4. were borrowed from Skarnitzl, Figures 1. and 2. were additionally rearranged.
34 Skarnitzl, "Acoustic Categories" 58. The idea of different phonation types as a continuum appears in M. Gordon, and Peter Ladefoged, "Phonation Types: A Cross-linguistic Overview," Journal of Phonetics 29 (2001): 383-406.
35 Skarnitzl, "Acoustic Categories" 57.

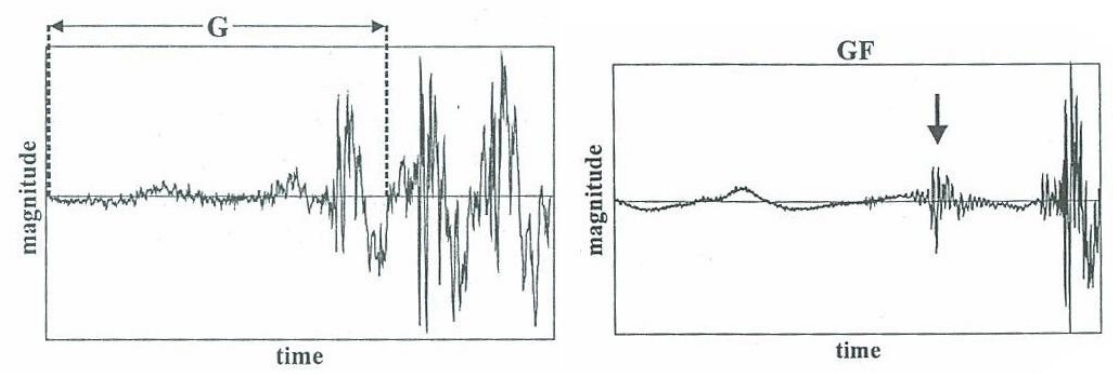

Fig. 1. Waveform of a canonical glottal stop (left) and a canonical glottal stop with flatulence (right)

Skarnitzl distinguishes a subtype to this canonical form, namely when another pulse (usually a weaker one) occurs during the hold phase. This pulse he imaginatively calls *glottal flatulence* to express the unpredictability of its occurrence and positioning.[36]

2.1.2.2 Barbell glottal stop

The waveform of the glottal stop can deviate more distinctly from the canonical form in that the hold phase is "preceded by one or two pulses directly linked to the preceding segment."[37] It has been named *barbell glottal stop* (Fig. 2.[38]) after its peculiar shape. There is again a subtype to it called the barbell glottal stop with flatulence.

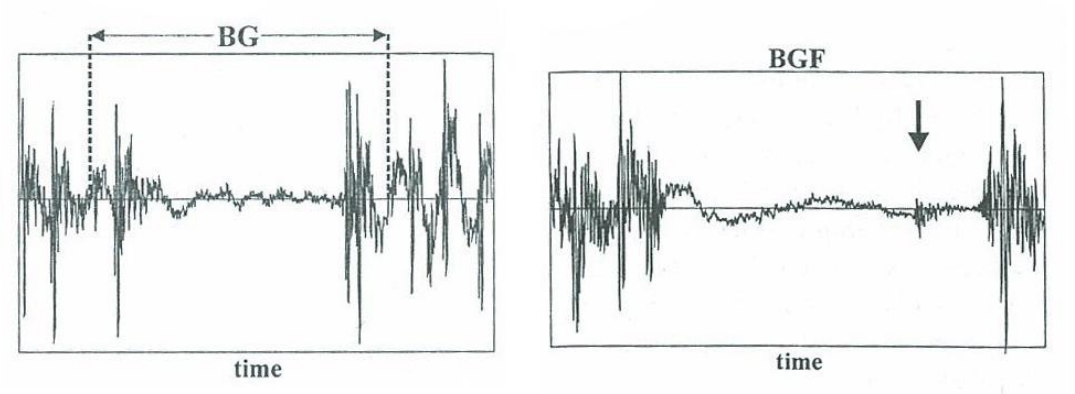

Fig. 2. Waveform of a barbell glottal stop and a barbbell glottal stop with flatulence indicated by an arrow (right)

36 Skarnitzl, "Acoustic Categories" 60.
37 Skarnitzl, "Acoustic Categories" 60.
38 Skarnitzl, "Acoustic Categories" 60.

2.1.2.3 Canonical vs. barbell glottal stops

The difference between the extra pulses that in one case only suffice for a *subtype* and in the other case constitute a new *type* lies not only in their strength[39] and their position but mainly in their effect on the duration of the whole segment. The average duration of a canonical glottal stop (with and without flatulence taken together) is 68.9 ms and, while the additional pulse or pulses on the left side of the barbell glottal stop cause a lengthening by approximately 15 ms (amounting to a total average of 84.1 ms), flatulence seems simply to occupy a portion of the hold phase.[40]

Segmental[41] and syntactic context was studied to determine whether it has any effect on the choice of a particular type. "[T]he tendency of [barbell stops] to be associated with voiced contexts [may be explained] by the fact that the first part of the barbell may function as glottalized portion of the preceding segment[,]"[42] whereas a glottal pulse (as a left part of a barbell) is not likely to occur immediately after a voiceless sound or breath, for which the glottis stays open and the articulation is tenser.[43]

In comparison to these tendencies, syntactic structure seems to be influential neither in the duration nor in the physical appearance of the stop.[44]

2.1.3 Other kinds of glottalization in Czech – creak

2.1.3.1 Creak

The second category of glottalization described by Skarnitzl as relevant in Czech is the *creak*, for which the Czech term "třepená fonace" is used.[45] Skarnitzl's conception

39 The left part of the barbell has equivalent intensity as the right part whereas flatulence is weaker. Skarnitzl, "Acoustic Properties" 73-74.

40 Skarnitzl, "Acoustic Properties" 75.

41 Segmental context considered in Skarnitzl's study was the actual phonetic realization, in contrast to Pavelková's phonologically understood segmental context (cf. section 2.2.1.4).

42 Here the author believes to report for the first time in scholarly literature post-glottalization "[. . .] in the form of a glottal pulse." Skarnitzl, "Acoustic Properties" 76. Cf. Footnote 127.

43 Skarnitzl, "Acoustic Properties" 76.

44 Skarnitzl, "Acoustic Properties" 77. At this point Skarnitzl uses the terms *syntactic* and *prosodic* interchangeably. It does not seem to us completely adequate to use the term *prosodic* when speaking about *clauses and complex and simple phrases*. Although, it has been noted by Dilley et al. that "[. . .] the boundaries of grammatical and semantic units are likely (although not necessary) locations for intonational phrase boundaries [. . .]." Dilley, et al. 424. Thus, Skarnitzl's findings with respect to syntactic influence on glottalization might coincide with the findings of a truly prosodically oriented research. Such a research, however, has not yet been applied in the research on glottalization in Czech.

45 Palková, et al. 72.

of creak combines more or less Huber's creaky voice[46] and creak.[47] But at the same time it specifies the interaction of two important aspects: regularity and temporal arrangement,[48] thus arriving at six possible subtypes. The three "temporal" categories, based on the course of the glottal pulses and/or a possible hold phase (equivalent to that of a stop), are doubled by the criterion of regularity.[49] Regular creaks are generally less frequent than those with irregular pitch period.[50]

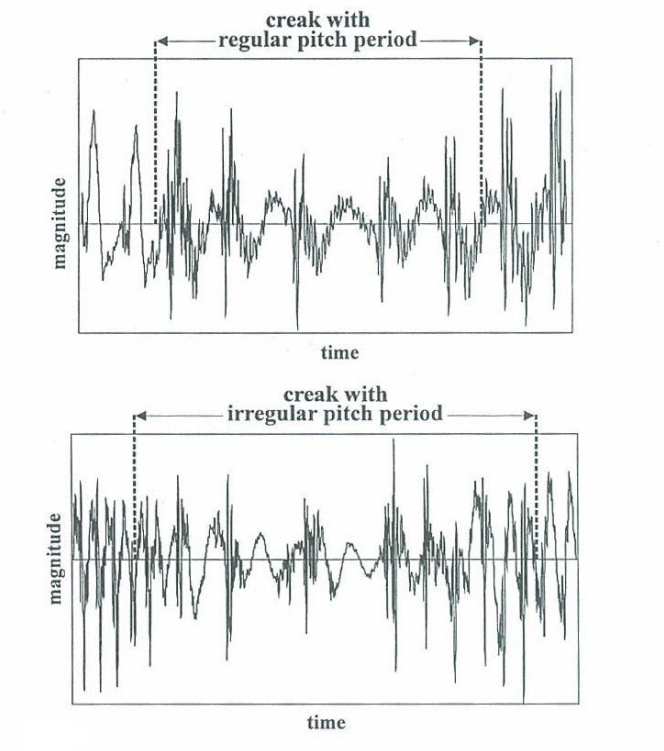

Fig. 3. Two types of creak from the viewpoint of regularity of the pitch period.

2.1.3.2 Continuous Creak

In a *continuous creak* glottal pulses accompany the whole segment and depending on their regularity this type corresponds to either *aperiodicity* by Redi & Shattuck-Hufnagel and *creaky voice* by Huber (if irregular in period-to-period duration)[51] or to

46 "[P]eriod-to-period irregularity" in Skarnitzl, "Acoustic Categories" 59.
47 "[S]ustained low F0 accompanied by near-total damping of individual glottal pulses" in Skarnitzl, "Acoustic Categories" 59.
48 What could possibly be understood in Huber's terms as a case of "total damping" of individual pulses, that means a case of varying amplitude. Skarnitzl, "Acoustic Categories" 62.
49 As the author points out, regularity in this case is a rather relative notion since the creak is in its nature irregular. The segments are considered regular if their "[. . .] variation coefficient *V* of the duration of pitch periods [. . .]" does not exceed 30%. Skarnitzl, "Acoustic Categories" 62.
50 If we add up the irregular creaks in all three temporal categories we find that they make approximately 61% of the whole. Skarnitzl, "Acoustic Categories" 64.
51 Skarnitzl, "Acoustic Categories" 67.

creak in their terminology (if relatively regular but with low F0, i.e. fundamental frequency).[52]

2.1.3.3 Creak with hold

With this subtype Skarnitzl does not say explicitly how it differs from a canonical glottal stop that is in many aspects very similar. But it is clear that since *creak with hold* consists of a hold phase and of the following glottal pulses the difference consists in the number of pulses, which has to be greater than two. And since "it is more likely for the burst which follows the hold phase to contain only one or two pulses [. . .]",[53] this is the least frequent subtype.[54]

2.1.3.4 Barbell creak

Not surprisingly, the barbell creak corresponds to the barbell glottal stop, except for, again, the higher number of pulses (at least three) that precede and follow the hold phase, making the whole "approximately 20 ms longer than the other types [. . .]."[55] Here it remains a bit unclear whether there must be three or more pulses on both ends or whether it suffices when they are on one end while the other end does not differ from a barbell stop.

52 Skarnitzl, "Acoustic Categories" 67.
53 Skarnitzl, "Acoustic Categories" 67. This constitutes a canonical glottal stop. Skarnitzl, "Acoustic Categories" 62. Skarnitzl, "Acoustic Categories" 57-58.
54 Only 6 out of 126 glottalized tokens in the experiment were classified as creaks with hold. Skarnitzl, "Acoustic Categories" 64.
55 Skarnitzl, "Acoustic Categories" 67.

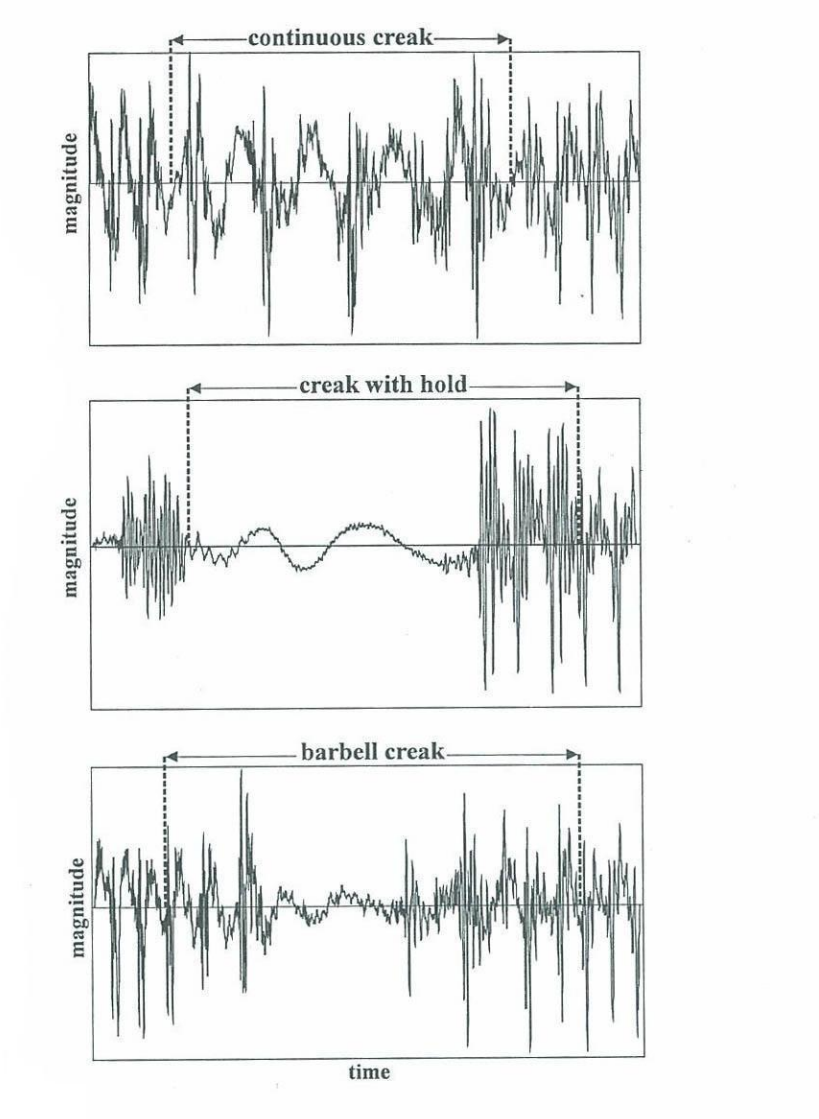

Fig. 4. Three types of creak from the viewpoint of temporal arrangement of the glottal segment.

2.1.3.5 Distribution of the creaks

Just like the stops, the creaks were also examined according to their distribution in context with similar results. The barbell creaks tend to appear in voiced preceding context and creaks with hold (similar to that of a canonical glottal stop) usually follow after voiceless sounds. Nevertheless, "continuous creaks are most frequent in both voiced and voiceless contexts [. . .]."[56] They are also the most frequent variant of

56 Skarnitzl, "Acoustic Categories" 67.

glottalization at all.[57] Similar to the case of the stops, syntactic structure does not seem to cause the preference for a specific type of creak.[58]

Skarnitzl further points out a tendency in the distribution of the glottal stops as opposed to the creaks. We have to keep in mind, however, the relativity of the findings (since only the conjunction "a" was analysed). The stops are more likely to separate higher syntactic units, while creaks are preferred in lower-level boundaries (for instance in the preposition "a" when it connects simple phrases.[59])

2.1.4 Other kinds of glottalization – breathy voice

The third basic category of glottalization is *breathy voice*, for which the Czech term "dyšná fonace" is proposed.[60] It is characteristic for this kind of phonation that the arytenoid cartilages are separated so that the "[n]ormal vibration of the vocal folds is [. . .] accompanied by a turbulent flow of air."[61] Skarnitzl's experiment, however, that was the basis for defining glottal stops and creaks in Czech, did not show examples of clear breathy voice. He reports only five (out of 126) cases in which tokens from the other two categories contained some breathy element.[62] On the other hand the distinctness of this phenomenon and its existence in Czech was described already by Hála. His term "znělý přídech"[63] refers to a form of laryngeal stricture that is weaker than the glottal stop. He mentions similar criteria as Palková et al., namely an

57 126 cases of glottalization in the experiment contained 52 tokens of continuous creak, distantly followed by the 28 tokens of the barbell glottal stop. Skarnitzl, "Acoustic Categories" 59, 61, 65.

58 Skarnitzl, "Acoustic Categories" 66.

59 The reason why this tendency exists is, in Skarnitzl's view, the fact that at the boundary between larger units a glottal *stop* is preferable because its essential component is "[. . .] a complete closure at some point". Skarnitzl, "Acoustic Categories" 66. We may interpret this as a tendency to a more profound delimitation of these units. The creaks with hold and barbell creaks, however, also contain such a complete closure. It is, we assume, because of their overall rarer occurrence that they do not suffice to manifest themselves in the "tendency of their category". Similarly, when Skarnitzl compares the stops and creaks with respect to the voicing context, he notices that creaks appear noticeably more often after voiced sounds. The author suggests this is a way how to save articulatory energy, since a change from modal phonation of a voiced sound to a creak is easier than a complete interruption. (Skarnitzl, "Acoustic Categories" 66) Here, again, we can see that the subtypes of creak which contain the hold phase, are in some respect (namely in their contextual behaviour) more similar to the stops. In this respect Skarnitzl's devision into stops and creaks might be a little problematic, because it is not completely obvious, why he choses the number of pulses to be a more important criterion for constituting a category than the presence of a hold phase that is the fundamental component in a stop. Cf. especially the role of the *opening quotient.* Skarnitzl, "Acoustic Categories" 58, 66.

60 Palková, et al. 72.

61 Skarnitzl, "Acoustic Categories" 58.

62 Skarnitzl, "Acoustic Categories" 59.

63 A possible translation into English is "voiced aspiration". Hála, Uvedení 281.

approximation of the vocal folds and the auditory perception of a "voiced breathy sound".[64] The origin of the sound is, however, further described rather in terms of breath intensity (and not as a different kind of phonation) and it is restricted only to the case when two vowels meet at syllable boundary.[65] Palková, in her comprehensive description of Czech phonetics and phonology, only mentions "dyšný hlasový začátek"[66] as an alternative to "měkký hlasový začátek"[67] and glottal stop, an alternative that is, however, not used in Czech.[68]

2.2 Previously described application of glottalization in Czech

It has been already mentioned in section 2.1.1 that glottal stop was for a long time the only type of glottalization described in Czech phonetic and phonological literature. It is, however, probable that the articulation of it was never completely uniform and the less canonical variants were also used, only they could not have been detected without the modern tools. The crucial question with the glottal stop has always been its function. And its particular function as a boundary signal was not hampered by the relativeness of its phonetic quality. Since „[t]he articulation in terms of which an utterance is identified are [. . .] not always necessarily the articulation by which it was actually produced[,]"[69] the boundary signal perceived as a glottal stop does not always have to be a canonical voiceless glottal plosive. That is why we will further use the term glottalization even in contexts where older literature used "ráz" with the meaning glottal stop and current literature might use it in the more general sense as described in section 2.1.1.1.

In Czech glottalization does not have the value of a phoneme as it has in some languages (e.g. glottal stop in Hawaiian[70], stød in Danish[71]). In Czech the most

64 "[Z]nělý *dyšný zvuk*". Hála, Uvedení 281.
65 The end of the first becomes weaker and the beginning of the following is pronounced more strongly. Hála, Uvedení 281.
66 "Breathy voice onset" Palková, Fonetika 56.
67 "Soft voice onset" Palková, Fonetika 55.
68 Palková, Fonetika 55.
69 Bernard Bloch, "A Set of Postulates for Phonemic Analysis," Language 24 (1948): 10, qtd. in Bjørn Stålhane Andersen, Pre-Glottalization in English Standard Pronunciation (Oslo: Norwegian Universities, 1968) 40.
70 Where it is "[. . .] part of the regular stop series." Ladefoged and Maddieson 74.
71 It is an interesting fact that sounds that in many languages used to be considered canonical glottal stops are very often found to be in fact much more variable within the category of glottalization, cf. Redi & Shattuck-Hufnagel 411. Tomáš Duběda, Jazyky a jejich zvuky: Univerzálie a typologie ve fonetice a fonologii, Praha: Karolinum, 2005.

common application of it is just the onset of phonation.[72] In other words, it can serve as a boundary signal at the beginning and, rarely, also at the end of a vowel.[73] Yet another possibility is the accompanying occurrence of creak at the end of an utterance.[74]

2.2.1 Glottalization in front of a vowel

When a vowel-initial word occurs after a pause it is usually pronounced with a preceding glottal stop, which happens automatically. In special circumstances glottalization in this position can be deliberately substituted with a different kind of voice onset, but this is usually possible only with special training (e.g. a "soft onset" in singing[75]).

In connected speech, glottalization serves as a boundary signal[76] – it signals the beginning of a vowel-initial word or root and it is a barrier to resyllabification.[77] In this position the usage is thought to be individual and it is in most cases optional.[78] It also happens generally without the knowledge of the speaker.[79] The only syntactic context in which it is now considered obligatory in standard pronunciation, is the position after the nonsyllabic prepositions *k, s, z, v.*[80] In this respect, the standard has gone through important changes during the 20th century.

2.2.1.1 Some historical aspects

While Weingart in 1932 regarded pronunciation without glottalization as nonstandard whatsoever, the first official orthoepy in 1967 tolerated it except after nonsyllabic prepositions and in front of the conjunctions *a, i*. Some insecurity remains, however, whether alongside this shift in the standard the actual usage has also dropped. The most important objection to this opinion is that the earlier authors may have not represented the true conditions but rather their ideal image of it.[81]

72 Palková, Fonetika 55.
73 Palková, et al. 71.
74 Palková, et al. 72.
75 In order to save the vocal folds from too much strain and also to provide a smaller air consumption. Cf. Palková, Fonetika 56.
76 Duběda 95.
77 Duběda 98.
78 Hála, Uvedení 359. Palková, Fonetika 325.
79 Pavelková 79.
80 Hůrková 25.
81 Jaromír Bělič, Nástin české dialektologie (Praha: SPN, 1972) 73.

Vachek (in 1968) postulated not just a mere decrease in usage but a simultaneous shift in the function of glottalization from a boundary marker to a signal of emotion and emphasis.[82] He argued that in most cases, where glottalization can mark the boundary between preposition and the governed word or between prefix and the root, pronunciation without glottalization does not cause ambiguity since there are other clues to recognize the boundary. He names above all the potential separability of preposition and noun[83]; and the disyllabic nature of the joint when two vowels meet, since the disyllabic vowel joint does not occur in word roots in the synchronically domestic lexicon.[84] The context was, in Vachek's view, another important clue for distinguishing pairs like *suchem* vs. *s uchem* (pronounced without a glottal stop).[85] These facts led him to the conclusion that even a complete elimination of vowel-initial glottalization would hamper neither the functional effectiveness of the utterance nor the signalization of the boundaries.[86] In his view, the emotionality connected with glottalization showed itself not only in the utterances expressing a warning (*Neopovaž se!* ['neʔopovašse] as opposed to neutral *On se toho neopováží* ['onsetoho'neopova:ži:]), hesitation or other uncertainties (*Já to neumím, opravdu!* ['ja:to'neʔumi:m'ʔopravdu]). He also interprets in this sense those instances of postvocalic or preconsonantal glottalization that are by other authors excluded from consideration just for their paralinguistic quality.[87]

Vachek did not expect "ráz" to become an exclusive marker of emotionality and to lose completely its function as a boundary signal, since its occurrence is always restricted to positions of word or prefix boundary. He supposed that the result could be the impossibility of using "ráz" only as a boundary marker without any indication of emotionality. But forty years after his postulate, no such definite change seems to have taken place. Despite some objections, it is mostly accepted that glottalization is on the decrease,[88] nevertheless it certainly has not become a purely emotional marker. The style of speech is thought to be the most important criterion of its usage.

82 Vachek, Dynamika 125.
83 E.g. *pod oknem vs. pod naším oknem.* Vachek, Dynamika 123.
84 Cf. Vachek, Dynamika 123.
85 Vachek, Dynamika 123.
86 Cf. Vachek, Dynamika 123.
87 Cf. Volín, "The Preposition" 13. See section 2.2.2 for further detail.
88 Hůrková 26.

2.2.1.2 Factors influencing the use of glottalization – style of speech

Careful or energetic pronunciation, slower speech rate, emphatic and emotional utterances are more likely to contain glottalized vowels.[89] It is also evident that glottalization is less frequent in everyday talk in comparison to public speaking. This tendency may be supported by the standard orthoepy that, in addition to the obligatory glottalization after nonsyllabic prepositions, recommends its use in professional talk (such as television and radio broadcasting) in most other positions to enhance the comprehensibility.[90] Since glottalization occurs at a higher rate also in public but nonprofessional utterances whose speakers mostly cannot be expected to know these recommendations, it can be assumed that this tendency to use glottalization as a means of increasing comprehensibility is a natural one.

It may be symbolic that the Czech standard is called "spisovný jazyk", that is "literary language" even with respect to pronunciation. The literary language is usually adhered to more strictly in public.[91] And since words in writing are generally divided by spaces it may lead to the conclusion that the "literary pronunciation" has to be made comprehensible by the distinct devision of individual lexical units. In English, on the contrary, proper linking techniques are required if the utterance is supposed to be comprehensible or supposed to be "standard". O'Connor speaks about a very jerky effect that is achieved if glottal stops are inserted between the words in an utterance like *He's always asking awkward questions* [hiz̩ˈʔɔːɫwɐɹz̩ˈʔɑːskɪŋˈʔɔːkw̩əgˈˈkw̩ɛstʃənz̩].[92]

The speech style is not the only aspect that influences the rate of glottalization. A smaller analysis has been made by Pavelková to see whether there are any regularities with respect to syntactic or segmental context. She analysed a sample of texts within only one speech style (the texts were presented publicly without previous preparation in a meeting of a city council).[93]

89 Pavelková 83.
90 Hůrková 26. Pavelková 83.
91 Henry Kučera, The Phonology of Czech ('S-Gravenhage: Mouton, 1961) 13.
92 Joseph Demond O'Connor, Better English Pronunciation (Cambridge: Cambridge University Press, 1995) 101.
93 Cf. Pavelková 79.

2.2.1.3 Syntactic context

Pavelková distinguishes five possible contexts in which a vowel-initial segment can occur: at word boundary; in compounds; between prefix and word root; after a syllabic preposition; after a nonsyllabic preposition. Only the instances at word boundary, however, were numerous enough to allow a reliable statistical analysis.[94] A tendency for less glottalization within a word could only be suggested. There were ten instances of both the combination of prefix + vowel-initial segment and syllabic preposition + vowel-initial word[95] and while the preposition was followed by a glottal stop eight times, the prefix was followed by it only twice.

The analysis of the instances at word boundary showed glottalization in 174 out of 288 cases (60.4%), in 107 cases there was no glottalization (37.1%) and the rest (2.5%) consisted of the instances of the prothetic *v*.[96] We can see that pronunciation with glottalization is generally preferred in public speaking. The tokens were further analysed according to the segmental context in which they occurred.

2.2.1.4 Segmental context

The preceding segment can be another vowel, which can have the same or different quality than that under scrutiny (e.g. *po obědě* ['poʔobjeďe], *na oběd* ['naʔobjet]). Or the glottalized vowel can come after a consonant. In that case there are three basic possibilities with respect to the effect of the glottal stop presence or absence: the consonant can be a voiced obstruent, a voiceless obstruent or a sonorant. Since vowel-initial glottalization behaves like a voiceless consonant itself, it causes voice assimilation according to the standard rules. A voiced obstruent becomes voiceless if the following glottalization is realized (e.g. *hned odpověděl* ['hnet'ʔotpovjeďel]). If, however, glottalization is not realized, the consonant can either stay voiced or it can become voiceless. This depends on what kind of word contains the final consonant. If it is a monosyllabic accented preposition or a prefix, the consonant stays voiced (e.g. *bezodkladně* ['bezotkladňe]).[97] If, on the other hand, a full-meaning word precedes,

94 Pavelková 79, 82.
95 These combinations can have identical segmental form: e.g. *nao*bědvat *se* vs. *mít na o*běd.
96 Pavelková 82. See section 2.2.1.7 for more detail on the alternatives to vowel-initial glottalization.
97 In this case pronunciation with a voiceless sound ['besotkladňe] is considered unnatural by most hearers. Palková, Fonetika 326.

the consonant is devoiced (e.g. *dub opadal* ['dup'opadal]).[98] A voiceless obstruent does not change if glottalization is realized. If it is not realized, the consonant becomes voiced if it is a part of a monosyllabic accented preposition or a prefix (e.g. *přes oceán* ['přezoceán]. A voiceless obstruent at the end of a full-meaning word stays voiceless (e.g. *pět oken* ['pjet'oken]). A sonorant does not change in any of these cases.[99]

Pavelková observed in her analysis some tendencies in the distribution of glottalization according to phonological segmental context. Segments that showed the highest rate of following vowel-initial glottalization were sonorants (76%), closely followed by vowels of the same quality as the following one (74%), vowels of different quality showed a similar rate (58%) as voiceless obstruents (56%), voiced obstruents were too scarce in the sample to have statistical significance.

The results of Pavelková with respect to the role of segmental context cannot be complemented by those of Skarnitzl[100], since Pavelková considered the underlying phonological structure, Skarnitzl, on the contrary, analysed the phonetic realization. Thus he, most probably, put vowels and sonorants together into one group of voiced sounds and merged voiceless and voiced obstruents, that undergo devoicing due to assimilation, into the "voiceless" group.

2.2.1.5 Prosodic context

Neither Skarnitzl nor Pavelková considered in their research the role of prosodic categories in the distribution of glottalization. Yet, prosodic context such as position within intonational phrase and presence of accent or lexical stress proved to be particularly important aspects in the recent research into English word-initial glottalization. The proposal for a research that would take prosodic structure into account follows in section 4.2.

2.2.1.6 Dialectal variation

The theory that the rate of glottalization varies significantly with dialect is not

98 See section 2.2.1.6 for more detail on the dialectal alternative ['dub'opadal].
99 Pavelková 79.
100 Cf. sections 2.1.2.3 and 2.1.3.5.

generally accepted. In the first half of the 1960s Hála held that it was indisputable that glottalization was more frequent in Bohemia than in Moravia. He saw a possible reason for this in the somewhat faster and staccato Bohemian speech style as apposed to the Moravian slower and legato style. And he probably meant not only the dialects but also the standard language spoken in Bohemia and Moravia, respectively.[101] Vachek, six years later, supported this view when he argued for the emotional quality of glottalization. According to him, the form of emphatic negation ['neʔe] was completely usual in Moravia, while glottalization as a boundary signal was practically unknown there.[102] Bělič, on the contrary, maintained that it was optional in the whole country, it depended more on the speech rate and the carefulness of the pronunciation and was not used frequently in ordinary speech. He ascribed the perhaps slightly greater frequency of glottalization in Prague to the relatively stronger segmentation of the speech in urban pronunciation.[103]

What might have contributed to this difference of opinion is the fact that Moravian and Bohemian pronunciation differ in the way the preceding obstruents behave when glottalization in the following vowel is not used. The standard pronunciation requires a glottal stop after nonsyllabic prepositions. These are all obstruents: *k, s, z, v* and so they become voiceless if glottalization is realized as required. If it is not, the connected pronunciation with a voiceless allophone is by most hearers considered nonstandard (e.g. *k oknu* ['koknu], *v okně* ['fokňe]). The pronunciation with a voiced allophone is typical for Moravian speakers and considered nonstandard as well (e.g. ['goknu], ['vokňe]).[104] When the final obstruent is part of a full-meaning word, the situation is analogous. The only difference is that pronunciation without glottalization is accepted in the case of final devoicing (e.g. *pět oken* ['pjet'oken]) but the voiced variant is regarded Moravian dialect ['pjed'oken].[105] And since the variant with final devoicing (common rather in Bohemia) is more similar to the pronunciation with glottalization, it is easier to identify the Moravian variant as not glottalized.

101 Hála, Uvedení 360.
102 Vachek 124.
103 Bělič 73.
104 Hůrková 25, 26.
105 Palková, Fonetika 327. This seems to be in line with another characteristic of Moravian speech. It uses regressive assimilation of voicing to a greater degree, even in cases when an obstruent is followed by a sonorant, e.g. *dnes nechci* ['dnez'nex tsi] as opposed to ['dnes'nex ts i] that predominates in Bohemian pronunciation.

2.2.1.7 Alternatives to vowel-initial glottalization

In dialects, nonstandard varieties of Czech, and to a much lesser degree also in the literary language, vowel-initial glottalization is sometimes replaced by the so-called *prothetic consonants*. They are inserted before words that begin with a vowel, also in derived forms (e.g. *voko, modrovoká, hale, jakorát*). Prothetic [j] and [h] are comparatively rare and are restricted to fewer dialects. Prothetic [v], on the other hand, is common in most dialects of Bohemia and in the western part of Moravia[106] and it is used to a considerable extent in the so-called Czech Common Language, the most common interdialect.[107] Although it is not accepted in standard pronunciation, we have seen in section 2.2.1.3 that it, nevertheless, can occur even in situations that require the standard.

An alternative to vowel-initial glottalization is, of course, pronunciation without glottalization. It has been already mentioned in previous sections, but at this point we would like to emphasize one difference between Czech and English. In Czech, there are no linking techniques that are typical in English. If the preceding segment is a consonant, a voiceless plosive or affricate in particular, the tendency for resyllabification (e.g. *toť on* [to'ťon]) is undesirable. Hála condemns this pronunciation as ugly and ridiculous.[108] Others do not treat it with such emotionality, but pronunciation with glottalization is nevertheless generally recommended, especially when the consonant is part of an unstressed syllable.[109] That can be understood as the same "prescriptive defence" against resyllabification as by Hála. If the preceding segment is a vowel, disyllabic pronunciation of the joint is required to prevent coalescence of the two vowels (pronunciations like *do okna* ['do:kna] are not accepted in standard pronunciation).[110]

2.2.2 Glottalization after a vowel and in front of a consonant

It has been already mentioned in section 2.2.1.1 that glottalization can also occur at the end of a vowel. This happens mostly before an absolute pause and the examples given in literature are generally very scarce: various forms of the emphatic negative

106 Krčmová 95.
107 Bělič 76.
108 Hála, Uvedení 280.
109 Palková, Fonetika 326. Hůrková 26.
110 Palková, Fonetika 326.

ne! [neʔ], *ne-e!* ['neʔe] and the expression of dislike *e-e!* ['ʔeʔe]. The same paralinguistic category includes also the cases in which the glottal stop precedes consonants (usually nasals) to express negation ['ʔm̩ʔm̩], [ʔne], [ʔneʔ] or hesitation ['ʔm̩].[111] Some of these functions are common in English as well. Ladefoged gives the example of expressing a negative answer with the expression ['ʔʌʔʌ] and illustrates that the glottal stop is crucial in conveying the negative meaning by contrasting ['m̩hm̩] for "yes" and ['ʔm̩ʔm̩] for "no".[112] Since these instances of glottalization do not fulfil the function of a boundary signal, they do not play any significant role in the prosodic system of either Czech or English.

2.2.3 Other use of glottalization

Unlike in English, glottalization in Czech does not play the role of plosive reinforcement (see section 3.2). In fact, it is only associated with consonants in the case mentioned in section 2.2.2. Glottalization in the form of creak in utterance-final position has been mentioned in literature,[113] no thorough description of the phenomenon, however, is available. Here we can see a possibility for future research with respect to the function of glottalization in the prosodic structure of Czech (cf. section 5.1).

3 Glottalization in English

3.1 Previous accounts of glottalization – terminological questions

In English the term *glottalization* can have several different meanings. In the broadest sense it covers not only the cases of nonmodal phonation in word-initial vowels and larger segments (such as utterance-final creaks) and the glottal reinforcement of voiceless plosives or affricates (e.g. *ship* ['ʃɪʔp], *rich* ['ɪʔʧ]) but also the replacement of the voiceless alveolar plosive (e.g. *better* ['bɛʔə]). This replacement is sometimes referred to as *glottalling* and if it is, the term *glottalization* is usually reserved for the phenomena where the glottal gesture has an "accompanying" quality, namely consonantal reinforcement and/or glottalization of vowels.[114]

111 Pavelková 79.
112 Ladefoged 52.
113 Palková, et al. 72.
114 Gerard J. Docherty, et al., "Descriptive Adequacy in Phonology: A Variationist Perspective." Journal of Linguistics 33 (1997) 275-310. 10 April <http://www.users.york.ac.uk/~pf11/Doch-etal-

Glottalization in English has been the subject of many studies in the past decades. The attention, that has been paid to it, is much bigger than that in Czech. This is mainly due to the fact that in Czech, as has been shown in the previous chapter, glottalization occurs mainly as a boundary signal in word-initial vowels. In English, on the contrary, this function is, at least in some dialects, only one of more possible utilisations of glottalization. In fact, the problems that are related to glottalization in English are too numerous than that they could be all dealt with in detail in this paper. For example, the differences between the rate of glottalling with respect to individual dialects, individual social classes or with respect to gender may be immense[115] and they are in their entirety outside the scope of the present work, which concentrates mainly on the basic comparison of Czech and English. What is more, glottalling and glottal reinforcement play a rather marginal role in the prosodic structure of most dialects. Glottalling is mainly associated with British English, while in American English it is generally common only in the position before syllabic nasals (e.g. *kitten* ['kʰɪʔn̩]). Vowel-initial glottalization in American English, on the other hand, has been described more thoroughly, including the prosodic point of view.[116] Another reason why we will mainly refer to the American standard is that currently, relatively many native speakers of American English, who are at the same time learners of Czech, are living in the Czech Republic which would allow a comparative research.

3.1.1 Glottalization of word-initial vowels

Recent studies on glottalization of word-initial vowels have been carried out, among others, by Dilley, Shattuck-Hufnagel & Ostendorf and by Redi & Shattuck-Hufnagel. "[They] summarize factors that have been proposed to affect rates and acoustic manifestations of glottalization"[117] and find the following as the most important: *phrasal position, segmental context, gender, dialect and variation with individual speaker.*[118] We will turn our attention to them after a more general introduction. It

JLING.pdf>. Pages 275, 280, 282 show an example of how the term can be used in both a broader and a narrower sense, depending on the need of specification.

115 Gerard J. Docherty, and Paul Foulkes, "Sociophonetic Variation in 'Glottals' in Newcastle English," Proceedings of the 14th International Congress of Phonetic Sciences (San Francisco, 1999) 1037-1040. 14 April <http://www.users.york.ac.uk/~pf11/ICPhS99-glottals.pdf>.

116 All the important studies by Dilley, et al.. Dilley & Shattuck-Hufnagel. Redi & Shattuck-Hufnagel. Bőhm & Shattuck-Hufnagel examined American English.

117 Redi & Shattuck-Hufnagel 408.

118 Redi & Shattuck-Hufnagel 408-412.

seems necessary, however, to stress right at the beginning that "[o]ne striking aspect of glottalization is its variation across individual speakers, both in its rate and in its acoustic characteristics."[119] This is the reason why every generalization must be approached with caution.

"A glottal gesture at the onset of a vowel-initial word, such as *issue*, *Arlene* or *about*, has been classified as optional allophonic variation in American English. Until recently, it was unclear in which sentential contexts this is most likely to occur."[120] The situation somewhat resembled the status of "ráz" in Czech linguistics. The *glottal stop* was considered *the* glottal gesture in vowel-initial words as late as 1994, only one year before Dilley & Shattuck-Hufnagel's publication. Both Gimson and, more relevantly for American English, Ladefoged know creaky voice in English as a possible modification of voice quality in falling intonation[121] or in affected speech.[122] The use of creaky voice and other nonmodal phonations in vowel-initial position was not known. In line with these notions was Wells' description of the *glottal stop* as an optional tool of emphasis in vowel-initial syllables, a sound that can be also used to avoid hiatus between adjacent vowels in consecutive syllables.[123]

3.1.1.1 Categorization of word-initial glottalization

The research by Dilley et al. showed, in the analysis of the speech of five professional radio news broadcasters, that there is a wider variety of glottal gestures that occur in word-initial vowels and that they can deviate quite substantially from the canonical glottal stop. They used [ɔ], the symbol for glottal stop turned upside down, to mark the segments labelled as glottalized to indicate their distinctness from the traditionally recognised form. They based their decision for labeling a segment as glottalized on perceptual and acoustic criteria: "First, a salient perceptual impression of a glottal gesture was required. Second, all those cases perceived as glottalized were subsequently examined more closely, and only those with an irregularity in the speech waveform were labeled as glottalized."[124] This irregularity could have several forms,

119 Redi & Shattuck-Hufnagel 408.
120 Dilley, et al. 423.
121 Ladefoged 141.
122 Cruttenden 154-155.
123 Wells 327.
124 Dilley, et al. 428.

the most common was irregular spacing of pitch periods as shown in Fig. 5.[125]

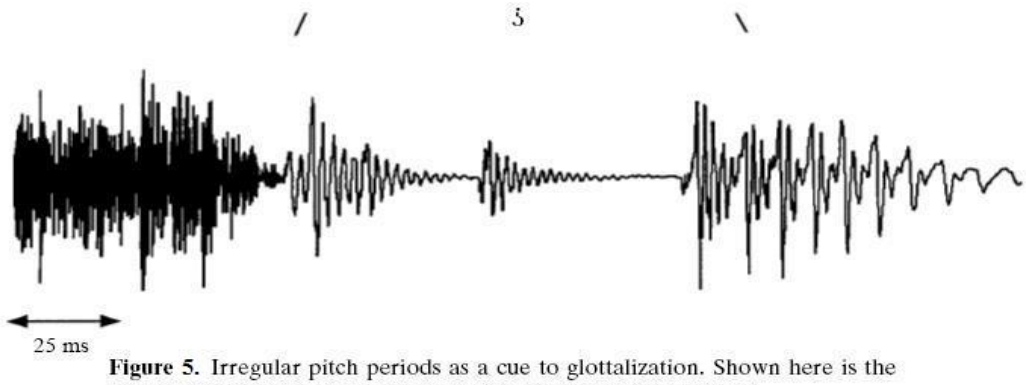

Figure 5. Irregular pitch periods as a cue to glottalization. Shown here is the middle portion of *justice ʒ of* where "ʒ" indicates glottalization.

Some of the tokens included longer periods of complete closure typical for a glottal stop. An example of this is shown in Fig. 6.[126] As we can notice this glottalized segment is similar to what Skarnitzl termed barbell creak in his description of glottalization in Czech.[127]

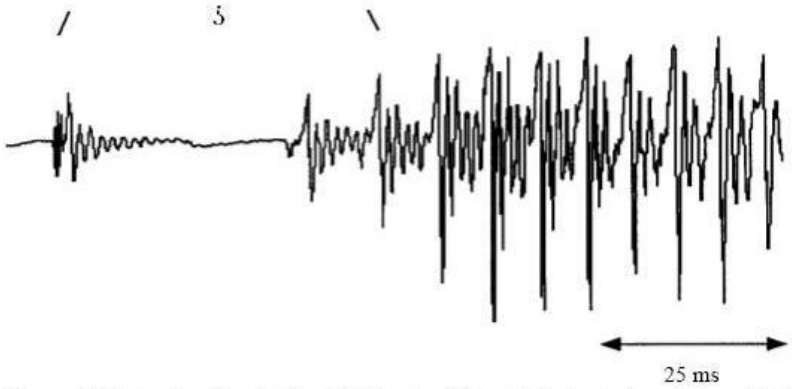

Figure 6. Example of a single glottal pulse followed by irregular pitch periods at the onset of a word-initial vowel. Shown here is *ʒE-* (from *Governor Edward*) where "ʒ" indicates glottalization.

Yet another acoustic characteristic that was sufficient to produce the impression of glottalization was a quick lowering of fundamental frequency as in Fig. 7.[128] Although

125 Dilley, et al. 429.
126 Dilley, et al. 429.
127 In section 2.1.2.3 we mentioned Skarnitzl's belief that "[. . .] post-glottalization in the form of a glottal pulse has not been reported before." Skarnitzl, "Acoustic Properties" 76. That seems to be in conflict with these findings in Dilley, et al. 428-429.
128 Dilley, et al. 429.

periodicity in these tokens was not disturbed, the pitch periods were changed in comparison to the segmental context.

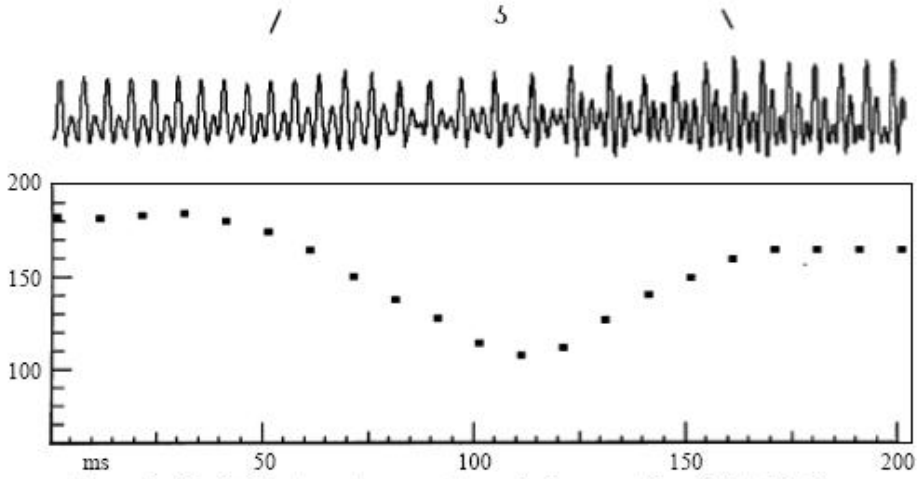

Figure 3. Dip in f_0 between two vowels results in perception of glottalization. Shown here is a portion of policy ɜ *is*, where "ɜ" indicates glottalization.

Fig. 8.[129] illustrates the strong cross-speaker variability in the acoustic properties of glottalization. In places where other speakers used glottalized sounds, one speaker marked his speech with a salient reduction of amplitude that could not, however, be counted as glottalized, since it did not meet the criterion of perturbed spacing of pitch periods. The lowering of amplitude is considered only a possible accompanying characteristic.

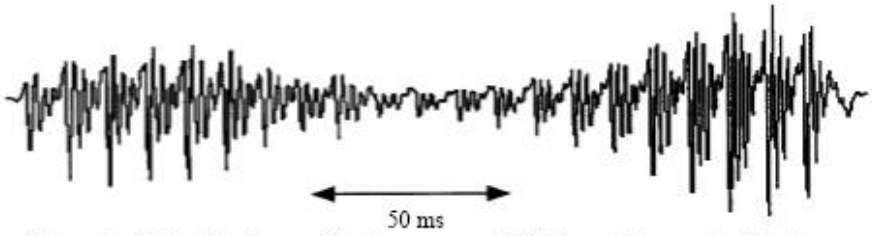

Figure 4. Reduction in amplitude on a word-initial vowel seems to signal glottalization. Shown here is a portion of *leader* ɜ *Edward* where "ɜ" indicates the "virtual glottalization".

In this study by Dilley et al. no categorization of these glottal events was presented since the primary goal was to find out how prosodic structure might affect distribution of glottalization. A detailed classification is presented by Redi & Shattuck-Hufnagel.[130] This classification was taken as one of the starting points in Skarnitzl's research into Czech glottalization but it does not seem really suitable for

129 Dilley, et al. 430.
130 Redi & Shattuck-Hufnagel 414.

the description of vowel-initial glottal gestures since it was designed mainly fot the purpose of studying glottalization in utterance-medial and utterance-final boundaries.

3.1.1.2 Tendencies in word-initial glottalization – prosodic context

Dilley et al. distinguish the following three types of prosodic context and report some predominant patterns in distribution of glottalization depending on these contexts:

a) Firstly it is the *"position in the intonational phrase."* They use Beckman & Pierrehumbert's distinction between *full* and *intermediate* phrases depending on "the presence *vs*. absence of a final boundary tone on the last syllable of the phrase, as well as a deeper *vs*. shallower boundary [. . .], respectively."[131] They used the ToBI (Tones and Break Indices) system that was first designed for prosodic labeling of English and has been since adapted for various other languages, however, not for Czech.[132]

Their analysis proved that "that speakers are more likely to glottalize word-initial vowels when those vowels occur at the beginning of a new intonational phrase."[133] Full intonational phrases showed a higher rate of glottalization even for reduced unaccented vowels (the speaker with the biggest difference glottalized 22% of reduced unaccented vowels were glottalized when they occurred in phrase-initial positions, while she only glottalized 3% of these vowels when they occurred phrase-internally).[134]

b) *"Presence of pitch accent on the target syllable or word"* is another prosodic criterion that proved to increase the likelihood of glottalization. Even if pitch accent is placed later in the word, the target word-initial vowel show higher rates of glottalization than vowels in words that have no pitch accent. And pitch accent on the target syllable increases the tendency yet more (one speaker in the research glottalized in phrase-internal positions 80% of accented full vowels vs. only 17% of unaccented full vowels).[135]

131 As proposed in M. Beckman, and J. Pierrehumbert, "Intonational Structure in Japanese and English," Phonology Yearbook III (1986): 15–70, qtd. in Dilley, et al 431.
132 K. Silverman, et al. "TOBI: A Standard for Labeling English Prosody," Proceedings of the International Conference on Spoken Language Processing 2 (1992) 867-870.
133 Dilley et al. 442.
134 Dilley, et al. 435.
135 Dilley, et al. 435.

c) The third important criterion is *"realized lexical stress"* which controls for the presence of a full vs. reduced vowel (e.g. different pronunciations of the word *adult*, either with a full vowel ['ædʌɬt], or with a reduced vowel [ə'dʌɬt]). The research suggested that "[. . .] the reduced-vowel tokens have substantially lower glottalization rates than unaccented full-vowel tokens [. . .]."[136] It is obvious from the previous paragraph that the rates for *accented* full-vowel tokens must have been the highest.

3.1.1.3 Tendencies in word-initial glottalization – segmental context

Dilley et al. demonstrated that preceding pause and glottalization in the preceding segment play an important role in segmental context. These two factors are particularly likely to be followed by glottalization in the following vowel, for which the authors offer two possible explanations. Either "the higher incidence of glottalization is simply due to mechanical constraints of starting a vowel after a pause and offset delay of cessation of preceding glottalization."[137] Or, the reason lies in the coincidence of the pauses and preceding glottalization with phrase boundaries that are the actual cause of glottalization. This question could not be definitely solved in the particular experiment because of the too scarce instances of pause and preceding glottalization in non-phrase-initial position.[138]

The research also proved that preceding segments has relatively small influence on glottalization in the following vowel when the segments are not themselves glottalized or when they are not separated by a pause. The only segments that increase significantly the rate of following glottalization are vowels and liquids, which supports the claims of Wells (cf. section 3.1.1). But this is only true in phrase-internal positions where other factors, e.g. a pause or boundary tone do not interact. Thus, prosodic context is much more influential in the distribution of glottalization than segmental context.

3.1.1.4 Other factors in word-initial glottalization – individual speaker, gender, dialect

There are other factors that influence glottalization, some of which have rather

136 Dilley, et al. 435.
137 Dilley, et al. 436.
138 Dilley, et al. 436. Further discussion of this question follows in section 4.1.

paralinguistic character, others belong to the field of sociolinguistics. Individual speakers may glottalize at strikingly different rates (e.g. 13 to 44% in one study[139]) and with different acoustic characteristics.[140] A potential cause for some variability are the physiological differences between the articulatory organs of the speakers.[141] All the factors are, however, not yet completely clear as it is the case with the role of gender in glottalization. Gender seems to interact with dialect since studies on different dialects (or languages) showed at times contradictory results with respect to glottalization rates according to gender.[142]

3.1.2 Utterance-final glottalization

Glottalization in utterance-final positions can be briefly defined "as perceivably irregular vocal fold vibration."[143] These irregularities may be produced either by the adduction or the abduction of the vocal folds that results in low or high glottal airflow, respectively.[144] Even if, however, the vocal folds are set as for modal phonation, irregular vibrations are possible, if other factors deviate from the norm, "e.g., if the trans-glottal pressure difference is not appropriate."[145]

3.1.2.1 Categorization of utterance utterance-final glottalization

Such glottalized portions of speech were traditionally called *creaky voice*[146] but a more specific classifications was developed by Redi & Shattuck-Hufnagel according to the acoustic qualities of these sounds. This classification consists of four groups: *aperiodicity* ("irregularity in duration of glottal pulses from period to period"[147]), *creak* ("prolonged low fundamental frequency accompanied by almost total damping of glottal pulses"[148]), *diplophonia* ("regular alternation in shape, duration, or amplitude of glottal periods"[149]) and *glottal squeak* ("sudden shift to relatively high

139 Dilley, et al. 432.
140 Redi & Shattuck-Hufnagel 408, 410.
141 Redi & Shattuck-Hufnagel 426.
142 Redi & Shattuck-Hufnagel 408-410.
143 Tamás Bőhm, and Stefanie Shattuck-Hufnagel, "Utterance-Final Glottalization as a Cue for Familiar Speaker Recognition," Interspeech (2007) 2657.
144 Bőhm & Shattuck-Hufnagel 2651.
145 Redi & Shattuck-Hufnagel 414.
146 Cruttenden 154. Ladefoged 141.
147 Redi & Shattuck-Hufnagel 414.
148 Redi & Shattuck-Hufnagel 414.
149 Redi & Shattuck-Hufnagel 414.

sustained f_0, which was usually very low amplitude"[150]).

3.1.2.2 Function of utterance-final glottalization – prosodic variability

Although it has been observed that "[. . .] utterance-final intonation phrase boundaries were associated with higher glottalization rates than utterance-medial boundaries, and in utterance-medial position, full intonation phrases were glottalized more often than intermediate intonational phrases[,]"[151] the question remains unanswered, to precisely which extent glottalization in these contexts is planned independently and to which extent it is a result of other factors (e.g. low F0 and low subglottal pressure occur frequently at phrase boundaries and they might be the cause).[152]

Resent research into utterance-final glottalization has suggested that individual speakers can produce characteristic patterns of glottalized segments that can be used by the listeners to recognise familiar voices.[153] Such specific findings are, however, not of particular interest for the present study.

3.2 Glottal reinforcement and glottalling

Glottal reinforcement of voiceless plosives /p, t, k/, and also of the voiceless postalveolar affricate /ʧ/, when they occur at the end of a syllable, takes place in various dialects of English. Especially in British English its usage has increased during the 20th century,[154] although, it is used by many speakers of American English as well.[155] In most dialects the reinforcement has the form of the adduction of the vocal folds just before the oral closure and is released before the oral release,[156] although, at least some dialects show fully voiced variants of glottalization.[157] This certainly resembles the situation with word-initial glottalization where the glottal stop is not the only possible variant either.

Glottalling is the full substitution of a glottal stop (or other glottalized segment) for /t/ and sometimes also of /p, k/ at the end of a syllable, when a vowel or sonorant

150 Redi & Shattuck-Hufnagel 414.
151 Redi & Shattuck-Hufnagel 425.
152 Redi & Shattuck-Hufnagel 426.
153 Bőhm & Shattuck-Hufnagel 2660.
154 Docherty & Foulkes 1037.
155 Ladefoged 53.
156 Ladefoged 53. Docherty & Foulkes 1037.
157 Docherty & Foulkes 1037.

precedes.[158] According to dialect this can happen in various following contexts. Mostly it is restricted to positions where other consonants follow (e.g. *brightly* ['bɹaɪʔli]) but some dialects can have [ʔ] for /p, t, k/ even intervocalically, Cockney is the dialect mostly associated with this kind of pronunciation (e.g. *supper* ['sʌʔə]). In American English intervocalically /t/ is usually realized as a alveolar tap [ɾ] and, in fact, tapping and glottalling are sometimes considered to be two variants of one process of *lenition*.[159]

The reinforcement and glottalling has received a lot of attention in literature.[160] But, since these phenomenons are rather marginal in the role glottalization plays in prosodic structure, they are outside the scope of this paper. An example of how glottalling plays a role in prosody is the *final release rule* in Tyneside English. In this dialect, both glottal reinforcement and glottalling are widely used, however, [t] is almost always fully released when it appears in pre-pausal position.[161] In prosody glottalization is mainly significant in the form of word-initial glottalization and the phenomena discussed in this section influence it rather at the segmental level (cf. section 3.1.1.3).

4 Formulation of the hypothesis

4.1 Differences between Czech and English glottalization

We have seen in section 3.1.1.3 that Dilley et al. raised the question whether high rate of post-pausal glottalization is due to mechanical constraints or due to the influence of phrase boundary. This is certainly an interesting idea with respect to post-pausal glottalization in Czech. It is generally accepted that glottalization after a pause occurs automatically in Czech as the onset of voice. An explanation seems to be missing as to why this type of voice onset is preferred to the other possible voice onsets.[162] In English, on the other hand, it seems that a different kind of voice onset is not only possible but also frequent. In the sample of English utterances of Dilley et al.'s

158 Wells 327.
159 This theory of J. Harris & J. Kaye is discussed in Docherty, et al. 284-287.
160 Cf. for instance the lists of references in Docherty & Foulkes; Docherty et al. and Frederik Kortlandt, "How Old Is the English Glottal Stop?" 7 Jan 2009 <https://www.openaccess.leidenuniv.nl/dspace/bitstream/ 1887/1926/1/344_103.pdf>.
161 Docherty, et al. 294-295.
162 Palková, Fonetika 55.

research "only" 64% of the tokens that were preceded by a pause, were found to be glottalized.[163] We may assume that the alternative corresponds to what Palková calls "soft onset" (cf. section 2.1.4). In English high glottalization rates due to the preceding pause was suggested to be "[. . .] a reflex of the prosodic boundary [. . .]."[164] Volín, in his analysis of glottalization in the preposition *of,* excluded the utterance-initial cases from consideration for the purpose of studying the linking phenomena.[165] But the analysis of post-pausal glottalization should be included in a prosodically focused comparison between Czech and English glottalization, because there seems to be a significant difference in the way these two languages prefer to begin phonation of vowels. And a better understanding of this problem might contribute to a better understanding of phrase-internal glottalization and, hopefully, of the phenomenon as a whole.

4.1.1 Liaison – linking techniques in English

The tendency to link words in connected speech, so that they are not separated from each other by a pause or "hesitation",[166] is a general feature of English. One way to achieve this is the omission of glottalization in vowel-initial words. This peculiarity of English is systematically emphasized in instructions to foreign learners.[167]

When a consonant precedes it is simply linked to the following vowel and, although true resyllabification does not usually take place in English,[168] it is nevertheless recommended to imitate such a shift of word boundaries, which can help the learner to master English linking.[169] This seems to be quite the opposite of what we have said about Czech where resyllabification is not appropriate (cf. sections 2.2.1 and 2.2.1.6). When two vowels meet at word boundary (e.g. *hurry up*) or at morpheme boundary (e.g. *hurrying*) the second vowel can be, and it usually is, linked to the preceding one with the help of a semivowel (junctural or transient [ʲ] [ʷ]), a linking [ɹ] or an

163 Dilley, et al. 436.
164 Dilley, et al. 436.
165 Volín, "The Preposition" 14.
166 O'Connor, Better 101.
167 E.g. Cruttenden 266. O'Connor, Better 101. Bowler & Cunningham, New Headway Upper-Intermediate Pronunciation Course (Oxford: Oxford University Press, 1999): 10, 15. Jan Volín, IPA-Based Transcription for Czech Students of English (Praha: Karolinum, 2005): 63. Joseph Demond O'Connor, Sounds English: A Pronunciation Practice Book (Harlow: Longman, 1989): 85-87.
168 Volín, IPA-Based Transcription 64.
169 Volín, IPA-Based Transcription 64. O'Connor, Better 101.

intrusive [ɹ] in non-rhotic dialects. Another example of how English prefers to link is the fact that there are two sets of definite and indefinite articles that are, in their weak forms, used according to the following segment (*a* [ə] and *the* [ðə] before consonants vs. *an* [ən] and *the* [ði] before vowels). The problem can be also approached from the other side, from the point of view of an English-speaking learner of Czech. It is not precise to interpret the difference between English and Czech as a necessity for learners of Czech to make a greater use of glottalization, even though similar instructions can in fact be found.[170]

4.1.2 Different effect of glottalization on the preceding segment

We have seen in section 2.2.1 that even in Czech the omission of the glottal stop in front of a word-initial vowel is in most cases possible. The problem is that in Czech the preceding segments can be affected by glottalization even if it is not realized, namely they can undergo devoicing (cf. section 2.2.1.4). The effect on the preceding segment is not usually discussed in literature dealing with word-initial glottalization in English but we may assume that the effect is the same as with other voiceless sounds, it causes assimilation of voice. Since, however, final devoicing in English differs from that in Czech, it seems plausible that learners of the particular foreign language can differ in pronunciation from native speakers in this respect. Volín observed in Czech English a significantly higher rate of glottalization than is usually produced in English by native speakers.[171] It is most probably not only the high rate, that causes the impression of a foreign accent in Czech English but also the influence glottalization exerts on the segmental context. In Volín's example *the eyes of the four people* the Czech English pronunciation with glottalization between *eyes* and *of* could differ from the pronunciation of a native speaker even if the native speaker himself glottalized in that position (which is rather unlikely unless the preposition *of* is stressed).[172] The Czech speaker would probably fully devoice the /z/ in *eyes* (thus producing something like ['aɪsʔɒv]), whereas the native speaker would probably devoice only partially, keeping *eyes* distinct from *ice*[173] (thus producing

170 James Naughton, Colloquial Czech (London: Routledge, 1992): 12. Laura A. Janda, "The Development and Drilling of Phonological Features of Czech," Czech Language Pedagogy Workshop, pp 10. 21 March 2009 <http://hum.uit.no/lajanda/mypubs/The%20development%20and%20drilling%20of%20phonologic%20features%20of%20Czech.pdf>.

171 Volín, "The Preposition" 17.

172 Volín, "The Preposition" 12.

173 Apart from the native-speaker distinction between *eyes* and *ice* that is produced through the

approximately ['aɹʐʔəv]).

4.2 The function of glottalization in the prosodic structure of Czech and English

The acoustic variability of glottalization in Czech has been examined by Skarnitzl according to segmental and syntactic context. Pavelková found some tendencies in the distribution of glottalization according to segmental context. Since earlier research into glottalization in English proved to be a good inspiration for the research into Czech as well,[174] it might be useful to consider the function of glottalization in the prosodic structure of Czech. It is evident that in English, prosodic categories are an important factor in the distribution of glottalization.

5 Methodology

5.1 Subjects and material

Volín suggested that further research should determine how stable a feature glottalization is in Czech English.[175] In this objective it would be beneficial to find out what status glottalization has in the speakers mother tongue and how it influences his pronunciation of the foreign language. A comparison with native speakers is certainly necessary and ideally one would compare the native and non-native speakers producing the same text.[176] The Czech speakers would be asked to produce Czech texts to find out their mother-tongue preferences, especially the role of prosodic factors in the rate of word-initial-vowel glottalization. Another possibility is the analysis of utterance-final glottalization, that has been reported, but not yet sufficiently studied. Then the speakers would be asked to produce English texts with the same purpose and their results would be compared with those of native speakers of English. It would be interesting to chose English speakers who are at the same time learners of Czech and to let them produce the Czech texts as well. Hypothetically, if native speakers of English have a lower rate of glottalization in English texts than do native speakers of Czech in the same texts, they should also have a lower rate of glottalization in Czech texts. This would supplement Volín's findings that Czech

different vowel length.

174 Skarnitzl, "Acoustic Categories" 58.

175 Volín, "Preposition" 17.

176 Volín, "Preposition" 16.

speakers of English reinforced the preposition "of" at a significantly higher rate than native speakers.

The texts for the analysis would be chosen with the aid of the information compiled in this thesis. For instance a text would allow control for the main prosodic categories that proved relevant in the research by Dilley et al. (with the necessary accommodation to the Czech prosodic system): lexical and sentential stress, position in intonational phrases and possibly speech rate.[177]

5.2 Acoustic analysis (Praat)

The precise procedure of the analysis would require a more detailed preparation. Here are at least some of the basic steps that have to be taken. The subjects' productions would be digitally recorded and the material analysed with the help of the Praat software.[178] Duběda & Skarnitzl[179] have presented some of the ways this freeware program can be used for prosodic analysis. It is also suitable for the acoustic analysis of the speech material. Before the analysis, the positions for possible glottalization occurrence would be determined and classified according to the prosodic features under scrutiny Then the tokens would be examined whether or not they contain glottalized segments according to the categories proposed in earlier studies or whether these categories have to be modified, as was the case, for example, in Skarnitzl's research on nonmodal phonation in the Czech conjunction "a". He found out that the categories that were proposed by other authors for the purpose of their research did not really apply for his findings.[180]

5.3 Statistical data processing (ANOVA)

Then the data gathered in the analysis needs to be statistically processed. The ANOVA (analysis of variance) method offers sufficient possibilities for phonetic research without being too complicated in its basic principles.[181] While controlling for some variables (e.g. text, dialect, gender, etc.), the data could be analysed to look for

177 Jana Vlčková-Mejvaldová, Prozodie, cesta i mříž porozumění: Experimentální srovnání příznakové prozodie různých jazyků (Praha: Karolinum, 2006) 32-38.
178 Praat, Vers. 5.1.04, Paul Boersma, and David Weenink, 20 Sept 2008 <www.praat.org>.
179 Tomáš Duběda, and Radek Skarnitzl, "Prosodic Analysis and Manipulation Demonstrated on the Praat software," Akustické listy 10/1 (2004): 12-17.
180 Skarnitzl, "Acoustic Categories" 59.
181 Jan Volín, Statistické metody ve fonetickém výzkumu (Praha: Epocha, 2007): 161-183.

any tendencies or regularities, e.g. dependency of glottalization on the prosodic structure, parallels between glottalization of individual speakers in the two languages, etc.

6 Conclusion

By presenting a summary of the accessible literature on the topic of glottalization in Czech and English, this thesis has tried to prepare ground for a research that would contribute to the understanding of the phenomenon. The individual languages were presented separately and the comparison has offered some suggestions as to what might be the possibilities for a prosodically focused research into Glottalization in Czech. The next step in the work should be the elaboration of the precise method by which material and subjects for the research would be chosen, resulting in the research itself.

7 Shrnutí

Tato práce se snaží na základě dostupné literatury představit problematiku glotalizace v angličtině a češtině, seznámit s novými poznatky v této problematice a naznačit cestu pro další možný výzkum. Převážně výsledky amerických výzkumníků na téma glotalizace v angličtině a na ně navazující práce Skarnitzlovy o rázu v češtině v několika posledních letech ukázaly, že glotalizace není zdaleka tak jednoduchým jevem, jak se donedávna předpokládalo.

Práce je rozdělena na čtyři hlavní části. Po stručném úvodu následuje první část, jež seznamuje čtenáře s tematikou glotalizace v češtině, druhá část se snaží o totéž v rámci angličtiny, třetí část přináší srovnání obou jazyků a vyslovuje několik domněnek ohledně rozdílnosti obou jazyků a čtvrtá ve stručnosti nastiňuje téma a podmínky dalšího možného výzkumu.

Tématu tzv. rázu v češtině se odborná literatura věnuje již minimálně sto let. Přesně před sto lety použil Antonín Frinta pro neznělou hlasivkovou explozivu (označovanou v mezinárodní fonetické abecedě symbolem [ʔ]) termín "ráz", který se od té doby nejvíce prosadil, v konkurenci různých označení dalších vědců. Proti tomuto termínu se však zároveň vždy nacházely určité výhrady a v posledních letech se v závislosti na nových výsledcích výzkumu objevil návrh na přehodnocení jeho významu. Ráz má být nyní chápán jako souhrnné označení "pro různé realizace hraničního signálu,"[182] vnímaného Čechy většinou jako ostrý, jasný začátek samohlásky na začátku slova (např. ['ʔokno]) či na morfémovém švu (např. ['doʔopravdy]), ve výjimečných případech po samohlásce nebo před slabičným konsonantem či po něm (např. ['neʔ], ['ʔm̩ʔm̩]). Dřívější představa, že se v tomto případě vždy jedná o neznělou hlásku tvořenou úplným sevřením hlasivek a jejich následným prudkým rozpojením, na něž plynule navazuje tvorba hlasu (v případě postvokalického rázu by šlo jen o sevření hlasivek a ukončení tvorby hlasu), musí být ve světle poznatků z analýz zvukových vln řeči opravena. Skarnitzlovy rozbory, navazující na práce zahraničních autorů (Huber, Dilley a kol., atd.), ukázaly, že mluvčí na místo úplného závěru hlasivek často tvoří závěr pouze částečný, či modifikují tvorbu hlasu různými jinými způsoby, přičemž výsledný sluchový dojem je zaměnitelný s hlasivkovou

182 Palková a kol. 71.

explozivou a takto modifikovaný segment plní stejnou úlohu hraničního signálu, nicméně akustická charakteristika tohoto zvuku se značně liší od jednoduchého závěru a jeho uvolnění. Skarnitzl dokázal ve vzorku nahrávek radiových hlasatelů rozlišit dvě základní kategorie tzv. glotalizovaných hlásek, které se vyskytly před spojkou "a", a které dále dělí na několik podtypů. Základní kategorie nazývá "hlasivková explozíva" a "třepená fonace", ve svých anglicky psaných pracích pak používá termíny "glottal stop" a "creak". Práce se dále zabývá důkladně Skarnitzlovou klasifikací glotalizovaných segmentů, jednak jejich akustickým popisem, jednak popisem jejich závislosti na okolí, a to jak na segmentální, tak na syntaktické úrovni. Rozlišení na základě vlivu prozodické struktury Skarnitzl neprovádí, ačkoliv v některých momentech užívá slova prozodický ve smyslu syntaktický. Ke Skarnitzlově názvosloví, či k jeho tvrzením se tato práce na několika dalších místech staví do určité míry kriticky (např. kap. 2.1.3.4; 2.1.3.5; 3.1.1.1), nicméně z jeho rozdělení vychází. Dále též připomíná třetí významný druh glotalizace resp. fonace, který bývá zmiňován v literatuře,[183] jedná se o takzvanou "dyšnou fonaci". I přesto, že je zařazována mezi tři základní druhy, v češtině se téměř nevyskytuje. Značný prostor je poté věnován rozboru užití glotalizace v češtině, které je v podstatě omezeno téměř výlučně na pozici vokalického začátku slova. Zmiňuje se jeho nefonémový charakter a značná individuálnost jeho užití. Je nastíněn stav ortoepické kodifikace a jejích změn, stejně jako teorie o ubývání rázu v češtině. Vachkova hypotéza z šedesátých let 20. stol. o probíhající přeměně rázu z čistě delimitativního prostředku na prostředek převážně vyjadřující emocionalitu je konfrontován se současným stavem, který o dokonání, ba ani o výrazném pokroku takové přeměny nesvědčí. Následuje diskuze faktorů, které užití rázu v češtině ovlivňují. Patří mezi ně především styl mluvy, vliv spisovného jazyka a profesionální mluvy. Pomalá mluva, snaha o pečlivost a tedy i profesionalita hojnost užití zpravidla zvyšují. Je zmíněna obecně vysoká tendence k užití rázu ve veřejných promluvách. Přehled doplňuje shrnutí menšího výzkumu Pavelkové, která se snažila zjistit, zda segmentální a syntaktický kontext užití rázu ovlivňuje. Zároveň je podán výčet možných konfigurací segmentálního okolí při užití respektive neužití rázu a funkce rázu při zpodobě znělosti, způsobující ztrátu znělosti přecházejících znělých

183 Palková a kol. 72.

souhlásek a výčet dalších možných změn v závislosti na významové váze slova, které předchází samohlásce na níž se potenciálně ráz realizuje. Dále se konstatuje absence prozodického hlediska při posuzování hojnosti užití rázu v češtině. Následuje popis některých výrazných rozdílů mezi českou a moravskou výslovností, co se rázu týče. Tyto rozdíly jsou uvedeny do souvislosti s tendencí moravské výslovnosti uplatňovat ve zvýšené míře regresivní asimilaci znělosti. Nechybí ani zmínka o alternativách – převážně dialektálního či hovorového rázu[184] – k užití rázu před samohláskou, jde o takzvané protetické hlásky. Je též připomenuta možnost, dosti samozřejmá, že ráz chybí a není ničím nahrazen. V takovém případě totiž může dojít k takzvanému přeslabikování, kterému se čeština v podstatě brání, ačkoliv může jít spíše o obranu normativního charakteru než spontánní snahu mluvčích. Jinou možností, která je ze standardní výslovnosti též vylučována, je splývání samohlásek patřících k sousedním slabikám, pokud se ráz nerealizuje. Otázce postvokalického užití rázu a dalších možností glotalizace v češtině je věnováno spíše méně pozornosti, protože se jedná o jevy, které buď nehrají zásadní roli v české prozodii, nebo nejsou dostatečně prozkoumané, zde vidíme prostor pro další výzkum.

Následuje část věnovaná glotalizaci v angličtině. Je zmíněna velká šíře problematiky, zvláště pak velká variabilita vzhledem k různým dialektům. Dále se věnuje pozornost glotalizaci ve slovech začínajících samohláskou, velké variabilitě mezi jednotlivými mluvčími a širokému spektru jímž se může glotalizace projevovat. Zvláště se probírá význam prozodických faktorů pro užívání tohoto druhu glotalizace. Zdůrazňuje se jejich nadřazenost významu, který má segmentální kontext. Nelze zapomenout na glotalizaci na koncích promluvy, která byla předmětem významných studií, jež došly k zajímavým názorům například co se týče možnosti role glotalizace při rozpoznávání známého hlasu. Tato část práce je zakončena oddílem zabývajícím se využitím glotalizace v souvislosti s anglickými souhláskami. Je to téma velice poutavé a aktuální, protože se dá pozorovat zvyšující se tendence k nahrazování a posilování neznělých exploziv glotalizací, zvláště v britské angličtině, nicméně se toto téma týká jen okrajově funkce, již glotalizace hraje v prozodii.

Třetí část seznamuje čtenáře s některými rozdíly mezi češtinou a angličtinou, které

184 Zde se ukazuje jedna z nevýhod, které byly tomuto termínu vytýkány, jeho víceznačnost může vést k různým nedorozuměním.

dosud nebyly zmíněny, nebo nebyly blíže osvětleny. Jde především o rozdíl, který, jak se zdá, panuje v převládající formě hlasového začátku v obou jazycích. Zatímco čeština nejspíše preferuje začátek tvrdý, který se po pauze používá zcela automaticky, angličtina nejspíše vykazuje jistou variabilitu a možnost použití hlasového začátku měkkého. Zmiňuje se tedy potřeba začlenit zkoumání rázu na začátku slova po pauze do výzkumu, který se má soustředit na prozodickou strukturu. Některé výzkumy angličtiny totiž naznačují, že více než předcházející pauza je pro tvrdý hlasový začátek významnější přítomnost hranice intonační jednotky. Na důkaz zvýšené tendence angličtiny k vynechávání rázu jsou zmíněny tzv. "linking techniques", tedy různé způsoby, jakými jsou na sebe navazovány hlásky ve vázané anglické promluvě. Jako jeden z rozdílů mezi češtinou a angličtinou, které souvisí s rázem, je nastíněn jeho vliv na přecházející segmenty, konkrétně na znělé párové souhlásky, které v češtině při užití rázu (ale za určitých okolností i při jeho neužití) zcela ztrácejí znělost, zatímco v angličtině dochází pouze k částečné ztrátě znělosti. Tento postřeh převážně pouze dokresluje, proč působí přílišné užívání rázu českými mluvčími angličtiny rušivě a vytváří dojem cizího přízvuku. Zdá se, že nejde jen o samotný ráz, ale i o jeho vliv na okolí. Nakonec se ještě zdůrazňuje, že vlivu prozodie na glotalizaci, respektive funkci glotalizace v prozodii byla věnována pozornost ve zkoumání glotalizačních jevů v angličtině a podobné hledisko by bylo vhodné uplatnit i při zkoumání češtiny, neboť se již osvědčila inspirace, již tento výzkum angličtiny pro českou lingvistiku představuje.

V poslední části jsou pak nastíněny některé aspekty, které by měl či mohl zohlednit praktický výzkum české prozodie s ohledem na funkci rázu v ní. Zkoumání české angličtiny, tedy angličtiny, jak jí hovoří rodilí mluvčí češtiny, by mohlo být prospěšné obohatit o výzkum anglické češtiny. Jsou též zmíněny metody či prostředky akustické a statistické analýzy, která by následovala po sběru vhodného zvukového materiálu.

Anotace

Autor:
Jakub Bortlík

Fakulta, katedra:
Filozofická fakulta Univerzity Palackého, Katedra anglistiky a amerikanistiky

Název bakalářské práce:
The function of glottalization in the prosodic structure of Czech and English (research proposal)

Název bakalářské práce v češtině:
Funkce glotalizace v prozodické struktuře češtiny a angličtiny (návrh výzkumu)

Vedoucí práce:
Mgr. Šárka Šimáčková, PhD.

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Klíčová slova:
glotalizace, ráz, hlasivková exploziva, nemodální fonace, třepená fonace, dyšná fonace, prozodie, čeština, angličtina

Klíčová slova v angličtině:
glottalization, glottal stop, nonmodal phonation, creaky voice, breathy voice, prosody, Czech, English

Charakteristika práce:
Tato bakalářská práce přináší přehled výzkumu glotalizace v češtině a angličtině. Seznamuje čtenáře se základními pojmy a možnostmi, jakými se glotalizace v příslušných jazycích projevuje, a jaké faktory ji mohou ovlivňovat. V detailech se věnuje nedávným výzkumům, které obohatily naše chápání fenoménu zvaného "ráz". Práce představuje variabilitu, jíž se tento fenomén vyznačuje a to jak v porovnání různých jazyků, tak uvnitř jednotlivých. Ukazuje na značné akustické rozdíly, kterými se jednotlivé druhy glotalizace liší a též naznačuje, s čím tyto rozdíly mohou souviset. Představuje českou tradici studia rázu a věnuje se některým specifikům, která tento jev v češtině má. V závislosti na nedávném výzkumu glotalizace v angličtině se ale také snaží přispět k rozvoji výzkumu češtiny. Jedním z možných využití předkládaného přehledu otázek a možných vysvětlení, které souvisejí s glotalizací, je i výzkum mezijazykový, který by navazoval na dřívější výzkum Volínův ohledně cizího přízvuku českých mluvčích angličtiny, který je způsobený nejspíše právě

rozdíly mezi vlivy, které způsobuje glotalizace, či které na ni působí v jednotlivých jazycích. Práce dává tato zjištění do souvislosti s poznáním o roli prozodické struktury na glotalizaci v angličtině a navrhuje výzkum, který by jednak přispěl k rozvoji poznání o roli glotalizace v české prozodii a jednak k poznání, jaký má vzorec užívání glotalizace, známý z mateřského jazyka, vliv na osvojení jazyka cizího.

Charakteristika práce v angličtině:
This thesis compares offers an overview of the research into glottalization in Czech and English. It introduces the reader to the basic terminology and the possibilities glottalization works in the two languages and what are the factors that can influence it. It dwells on the recent research, that has enriched our understanding of the phenomenon called "glottal stop". This work presents the variability, that is so peculiar to this phenomenon, both interlingually and within a given language. It shows the considerable acoustic differences that distinguish the individual types of glottalization and it suggests some explanations as to what are these differences related to. It presents the Czech tradition of the study of glottalization and it considers some peculiarities that are connected with this phenomenon in Czech. In relation to the recent research into glottalization in English it try also to contribute to the advancement of research in Czech. One of the possible utilisations of the present list of questions and proposed explanations, is the interlingual research that would follow up with Volín's research into foreign accent of Czech speakers of English, that may be caused in the different influences, that glottalization causes, or that influence it in the particular language. The thesis brings these findings into connection with the knowledge of the role prosodic structure has in glottalization in English and it proposes a research, that would contribute partly to the understanding of glottalization in Czech prosody and partly to the understanding of the role the pattern of glottalization known from the mother tongue, plays in the process of learning a foreign language.

Jazyk práce:
angličtina

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