Charles University

Faculty of Education

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BACHELOR THESIS

Perception of Intrusive /r/ by Czech Learners of English

Percepce intrusivního r českými studenty angličtiny

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Branch of study:	Anglický jazyk se zaměřením na vzdělávání
	Český jazyk se zaměřením na vzdělávání

2020

I hereby declare that the bachelor thesis *"Perception of Intrusive /r/ by Czech Learners of English"* is my original work and no other sources than those listed on the *Works cited* page were used in its making. I also declare that this thesis was not used to obtain another or the same university degree.

Prague, April 28, 2020

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ACKNOWLEDGEMENTS

ABSTRACT

The aim of this thesis is focused on analysing the perception of the intrusive /r/ occurrence in native speech by Czech learners of English. The theoretical part consists of the description of the nature of connected speech and its features with an in-depth examination of the phenomenon of intrusive /r/, along with the depiction of two key terms in the domain of perception of a non-native language: intelligibility and comprehensibility. The practical part analyses the data amassed from perception tests focused on the intelligibility and comprehensibility of the recordings containing intrusive /r/ at a grammar and secondary school.

KEYWORDS

intrusive r, comprehensibility, intelligibility, non-native listeners, perception

ANOTACE

Tato bakalářská práce si klade za cíl prozkoumat, jak čeští studenti angličtiny vnímají souvislou řeč rodilých mluvčích obsahující intrusivní r. Teoretická část je složena z popisu podstaty souvislé řeči a jejích prostředků, intenzivně se věnuje fenoménu intrusivního r a osvětluje dva klíčové termíny týkající se vnímání cizí řeči: objektivní a subjektivní porozumění. Praktická část analyzuje data, která byla získána na střední škole a na gymnáziu z percepčních testů na objektivní a subjektivní porozumění nahrávkám s výskytem intrusivního r.

KLÍČOVÁ SLOVA

intrusivní r, subjektivní a objektivní porozumění, nerodilí mluvčí, percepce

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INTRODUCTION

Presumably many learners acquiring English as their second language have experienced the shock of having their first informal conversation with a native speaker, whose speech remained rather far away from what a learner would expect based on their English lectures. Certain connected speech phenomena remain unfamiliar to many English learners, hence their occasional struggle understanding native production. Studying phonetics and phonology offers a great aid to uncovering the basic principles of speaking fluently, along with bringing such formulas into the consciousness of students. For instance, the awareness of the existence of weak forms, rhythmic patterns, linking, assimilation and other phenomena may be particularly useful. The vast majority of these features seemed very valid and easy for me to comprehend when they were introduced to me, such as assimilation or elision of certain sounds, except for one. Intrusive /r/, a linking device which suffered a great deal of stigmatization in the past.

As soon as I was first acquainted with the phenomenon, it seemed almost implausible that employing the /r/ sound to connect two vowels may be perceived as legitimate by phonologists and described in textbooks, let alone used by any native speaker of English. My consecutive thought was: if the intrusive /r/ is somehow systematically used, how has it gone unnoticed to my ear while rightfully having the word *intrusive* in its name? Hence, I started listening thoroughly, and the sound of /r/ started appearing in places where one would not expect it. I began speculating whether those learners of English, who are not familiar with the field of phonetics and phonology, let alone with the phenomenon itself, would be able to spot "something odd" in a speech containing intrusive /r/. In addition, I was curious whether its presence would generate a difference for them. While attending a student conference aimed at presenting excellent bachelor theses defended at the English department, I was introduced to Denis Vaníček's work, which is concerned with the occurrence of intrusive /r/ from a sociophonetic point of view. The results and method used seemed compelling and inspiring to such a degree that I decided to follow his footsteps and test how intrusive /r/ is perceived by Czech learners of English.

Firstly, in the theoretical part of this thesis, the area of connected speech in general is scrutinized, particularly assimilation, elision and linking. Furthermore, the target phenomenon of intrusive /r/ is comprehensively described from multiple points of view and the most recent research is taken into account. Consecutively, two key concepts that lie at

the centre of the research design, intelligibility and comprehensibility, are introduced and the methods of their measurements are described. Secondly, the practical part is concerned with the analysis of the students' perception, explaining the variables employed in the testing and introducing the multiple hypotheses that were created. Finally, the amassed data and research results will be orderly presented and discussed with respect to the hypotheses.

THEORETICAL PART

1. Features of connected speech

Connected speech is a linguistic term that defines spoken language as a continuous sequence where individual sounds, words or even phrases undergo significant changes when they are used in connection and not studied in isolation (Crystal 101). Sounds may be replaced by different ones, added or omitted (Alameen and Levis 160), because they follow so rapidly that the tongue is not always in its ideal position for pronunciation (G. Brown 4.1). As a result, consonants and vowels frequently sound different when employed in speech (G. Brown 4.1).

The phonetic form of a word may occur in many different alternatives due to various factors concerning the speaker and situational factors (Hardcastle 321). The changes can be affected by linguistic context (for instance the pronunciation of neighbouring consonants), speech rate or register (Alameen and Levis 160).

Intrusive /r/, which is the chief focus of this thesis, belongs with its nature to the realm of connected speech as it is a device that helps the speaker to pronounce with less effort. Before a comprehensive description of the feature is provided, other related features will be introduced in order to offer an overview and explanation of the phenomena that are responsible for changes that occur in connected speech.

1.1. Assimilation

Assimilation is an omnipresent connected speech process, during which a phoneme influences a neighbouring segment, which then changes its features in order to resemble the former (Volín 67). The influenced phoneme may become even identical to the influencing one. In most cases, this process affects consonants (Roach 138). The extent of assimilation is related to the tempo and style of the speech (Roach 138), it is generally more prone to appearing in rapid colloquial speech. The degree of the change frequently varies (Roach 138).

The phenomenon may occur among a pair of two words split by either a word boundary or word-internally (Celce-Murcia 160). The subject of the influence is the last consonant of the first word (Co1) and the first consonant of the second word (Co2). It is possible to distinguish two directions of the change. Regressive assimilation is a process whereby Co2

influences Co1, in other words, the following changes the preceding. On the contrary, in progressive assimilation Co1 affects Co2, therefore, the preceding changes the following.

The English language is considered to predominantly use regressive assimilation (Volín 67), which is demonstrated by the following example (taken from Volín 67): *this year* may be pronounced /ðɪsˈjɪə/, but some speakers, presumably in informal contexts or in faster production, may say /ðɪʃˈjɪə/ instead. The voiced palatal approximant /j/ influences the voiceless alveolar fricative /s/, changing it to a voiceless palato-alveolar fricative /ʃ/.

It is possible to distinguish three types of assimilation according to distinctive features in which individual consonants differ: place, manner and voicing. Assimilation of place is observable in the following example: the final alveolar /t/ in *that person* /ðæt ˈpɜːsn̩/ changes to /p/ under the influence of the initial bilabial /p/ in the second word: /ðæp ˈpɜːsn̩/ (Roach 139). Despite the fact that the consonants become alike, neither of them gets omitted, English speakers pronounce them in approximately the same duration as a standard two-consonant cluster (Roach 140).

Assimilation of manner is, as Roach states, much less apparent than the previous type (140). Manner is most frequently changed towards a consonant that takes less effort to pronounce (Roach 140). For example, in *get them* /get ˈðəm/, the dental fricative /ð/ changes to an alveolar plosive /t/: /gett̪əm/ (Roach 140).

Assimilation of voice is employed across the word boundary or within one word. Most noticeably, it regressively influences weak forms of short grammatical words, exclusively from voiced consonant to voiceless (Roach 140), for example: *of course* /əv ˈkɔːs/ changes to /əf ˈkɔːs/. The voiceless plosive /k/ forces the preceding voiced fricative /v/ to change to its voiceless counterpart /f/. Assimilation of voice in the progressive form occurs when grammatical endings are pronounced, such as -s (symbolizing both plural and 3rd person singular) and -ed, for example in *likes* /laɪks/ and *liked* /laɪkt/. In both cases the voiceless plosive /k/ makes the following consonant voiceless as well, so the pronunciation can be as smooth as possible.

In addition to those three types, there is a special and complex type of assimilation called coalescent assimilation, or in other words, assibilation. Changes affect alveolar plosives /t, d/ and alveolar fricatives /s, z/ in final positions in combination with the palatal approximant /j/ in the following initial position. The two affected consonants merge and create one. This matter may be shown in the following example: *would you* /wʊd ˈjʊ/ changes to /wʊdʒʊ/.

Friedlová states that assibilation is more frequently employed including /t, d/ rather than /s, z/ in the speech of upper-intermediate non-native speakers, whereas native speakers tend to use both to similar extent (46). Interestingly, in these cases, the change is prone to appear even in slow careful speech (Kazmierski 237).

1.2. Elision

Elision is a widely used aspect of connected speech during which the omission of a sound, a consonant or a vowel, occurs. However, the modified word must still remain intelligible. The elision of sounds is more frequent in informal and fast speech (Roach 142). Although there are many various occurrences of the phenomenon, it is possible to distinguish a handful of conditions under which consonants frequently undergo elision. Consonants at the end of a syllable are more liable to disappear and the two phonemes that are most likely to be dropped are /t/ and /d/ (G. Brown 4.2). If these two sounds stand between other consonants, their elision is prevalent and it is not customary for speakers to pronounce them (G. Brown 4.2). Generally, there is a clear tendency for speakers to avoid and therefore simplify complex consonant clusters (Roach 142). For example, the verb *acts* /ækts/ si more likely to be pronounced /æks/. Negative forms before consonants are also affected: *doesn't* /dʌznt/ becomes /dʌzn̩/.

Concerning vowels, weak vowels (in unstressed syllables) are likely to disappear after /p/, /t/ and /k/ owing to the aspiration of those consonants, which replaces the vowel. For instance, the word *potato* /pəˈteɪtəʊ/ → /pʰˈteɪtəʊ/ (Roach 142). Before the long vowel /ɔ:/, the approximant /l/ tends to disappear, as in the word *always* /ɔ:lweɪz/, which is therefore pronounced /ɔ:weɪz/.

1.3. Linking

Linking, also referred to as liaison, is a „transition or link between sounds or words" (Skandera 58). Owing to liaison, the sound of the native English language is rather smooth with seamless transitions, which many non-native speakers lack (Celce-Murcia 158). It helps the speech sound natural and less effort is needed on the side of the speaker.

Regarding articulation, a glottal stop should be omitted when two words are linked together. During the glottal stop, the opening between the vocal folds, called the glottis, temporarily closes for a very short time, which creates a voiceless sound (Volín 63). If glottal stops were used instead of linking words together, the speech would sound „discontinuous" *(*Volín 63)

and „mechanical" (Roach 144). As soon as the word is initiated with a vowel, they are used very sporadically and in specific cases, such as when putting emphasis or expressing emotional charge (Volín 63). It is possible to divide linking devices into three groups depending on whether the liaison is consonant-to-vowel, consonant-to-consonant or vowel-to-vowel. Intrusive /r/, which is the chief focus of this thesis, is classified among vowel-to-vowel linking devices and it is going to be given a special attention and an in-depth description.

1.3.1. Consonant-to-vowel linking

In connected speech, if the first word ends with a consonant and the second one begins with a vowel, it may seem that the boundaries of the syllable do not correspond to word boundaries (Volín 64). The syllable boundary shifts and may potentially overlap the word boundary, which causes the two neighbouring words to join together in order to avoid the usage of a glottal stop. This phenomenon is referred to as resyllabification (Celce-Murcia 159). This linking device may be demonstrated by the two following examples taken from Volín: without linking, the phrase *got into his car* would be pronounced /gɒt.ɪn.tʊ.ɪs.ˈkɑː/, whereas if resyllabification is employed, the pronunciation would more likely be /gɒ.tɪn.tʊ.ɪs.ˈkɑː/. (64) The consonant /t/ in the first syllable is perceived as shifted to the second to maintain smooth speech. However, Volín stresses that the syllable boundaries are not truly shifted, although it strongly seems so (64). The genuine shift manifests only when the tempo of the speech is very rapid (Volín 64). Celce-Murcia also points out that aspiration is not employed in some cases, for instance after /t/ in *left arm* (159).

Volín employs a similar term pseudo-resyllabification (64), the meaning of which is not entirely identical to resyllabification. Pseudo-resyllabification is a technique, which helps non-native students of English understand the principle of linking. Subsequently, they may use it in their own speech in order to avoid the extensive use of glottal stops. The nature of pseudo-resyllabification is rather perceptive, as learners hear pseudo-syllables (which do not exist from the objective point of view) and this helps them grasp the principle of linking. Such exercise may be extremely beneficial for Czech learners of English, whose English may often sound discontinuous (Volín 63). As a rule, the Czech language uses glottal stops before vowels (Romportl 85), which contrasts with English linking.

1.3.2. Consonant-to-consonant linking

When two consonants meet across the word boundary, the changes tend to be subtle (Hewings 58). However, the two following examples of consonant-to-consonant linking are identified. Firstly, a plosive in a final position followed by another plosive or a nasal lacks an audible release (Hewings 58). The closure for the plosion occurs while the articulation for the first consonant begins, however, the pressure is released while the second consonant is articulated, such as in *top boy* /tɒp̚ ˈbɔɪ/ (Cruttenden 158). Secondly, two identical successive consonants across the word boundary, also called geminates, may be joined together to ease the pronunciation (Hewings 85). Therefore, the two words are connected by one prolonged consonant, for instance the /m/ sound in the phrase *some milk* (Hewings 85).

1.3.3. Vowel-to-vowel linking

Simply put, if two successive vowels are to be linked, an additional sound is inserted between them (Skandera 58). This process may be done between two syllables or across the word boundary (Skandera 58). Should the connection not be established and a glottal stop is employed instead, the gap between the two vowels is called a hiatus and the vowels are therefore in hiatus (Skandera 58). Eliminating the hiatus is not compulsory, words in which the linking devices are not regularly used to connect vowels also occur, for example „cooperate" (Skandera 58). To compare, in standard Czech two vowels are likely to be separated by a glottal stop provided that the word ending with a vowel is a preposition or a prefix, for example *do okna* /doʔokna/ or *doopravdy* /doʔopravdi/ (Palková 326). The main aim is to prevent the merger of the two vowels (Palková 326).

1.3.3.1. Transient /j/

If a word ends with the front vowels /iː, ɪ/ or diphthongs /eɪ, aɪ, ɔɪ/ and is followed by a subsequent word that has a vowel in its initial position, it is possible to insert an additional approximant /j/ between the two vowels (Volín 66). The /j/ sound in general is regarded as a semi-vowel (Cruttenden 93) as it is a „*rapid vocalic glide*" (Cruttenden 210) with a phonetic structure resembling /iː/ (Cruttenden 211), to which it glides while pronounced. The phenomenon may be demonstrated on the following example: in the phrase *three oaks* /θriː ˈəʊks/, the long vowel /iː/ shall be connected to the following diphthong /əʊ/ by /j/ sound: /θriː‿jəʊks/. However, when transient /j/ is employed, the consonant is not fully pronounced (Volín 66). Instead, Volín describes the sound as an „articulatory co-product",

which is a „mere transient from a close front vowel to a vowel which is articulated elsewhere" (66). Cruttenden also confirms that the linking and phonemic /j/ are different by using the distinction between *my ears* /maɪ ˈʲɪəz/ and *my years* /maɪ ˈjɪəz/ (290).

1.3.3.2. Transient /w/

The linking device transient /w/ is in its nature very similar to transient /j/. It may be inserted between the word-final back vowels /ʊ, uː/ and diphthongs /aʊ, əʊ/ (Volín 66). Like /j/, /w/ is also a semi-vowel (Cruttenden 93) which functions on the same glide principle (Cruttenden 210). From the phonetic point of view, it is similar to the long vowel /uː/ (Cruttenden 211). The usage of transient /w/ may be observed on an example *two oaks* /tuː ˈəʊks/, in which the long vowel /uː/ and the diphthong /əʊ/ are linked: /tuːˌwəʊks/. In an analogy with transient /j/, the /w/ sound is not fully pronounced as it is rather a „glide from close back area in the vocalic space to another vowel" (Volín 66). Volín also mentions that IPA transcription including transient /w/ and /j/ is used almost exclusively as an educative technique for ESL speakers to improve their connected speech (66).

1.3.3.3. Linking /r/

Linking /r/ may be regarded as the most remarkable example of linking among all (Giegerich 281). It is going to be explored in a slightly deeper manner as it is often related and compared to intrusive /r/, which is the main focus of this thesis. Linking with the otherwise unpronounced /r/ sound is a phenomenon which exclusively occurs in non-rhotic accents, also called r-less or non-r-pronouncing (Skandera 60). Non-rhotic accents drop the /r/ sound before a consonant or a pause (Sóskuthy 58).

Generally speaking, when a vowel precedes the otherwise unpronounced but orthographically present phoneme /r/ in the final position and another vowel in the initial position of the next word follows, /r/ may become fully pronounced (Skandera 58). Although the word *far* is pronounced /fɑː/ in isolation, therefore, the orthographical <r> is usually omitted in speech, in the sequence *far away* it frequently becomes present as a linking device: /fɑːrˌ əˈweɪ/. Additionally, Giegerich explains the matter using a comparison of *hammering* and *hammer it* (282). If the usage of linking /r/ in the second phrase is expected, the /r/ sounds in both examples occur in a syllable onset if used in speech (Giegerich 282). Broadbent mentions the division in opinions, asserting that some phonologists claim that /r/ is actually present in non-rhotic accents and it undergoes deletion in specific situations, whereas the contradictory opinion is that the /r/ sound is possibly

inserted after vowels (Broadbent 283). Volín asserts to see the connection with pseudo-resyllabification, which was mentioned earlier, because the /r/ that occurs in a final position within the syllable (and the word) seemingly shifts[1] to the first syllable of the following word (64). Sudbury and Hay regard the reappearance of /r/ across the morpheme boundary as a case of linking /r/ as well (282). Compare *fear* /fɪə/ and *fearing* /fɪərɪŋ/. This instance is referred to as internal linking /r/ (Sudbury and Hay 282) and it occurs very naturally and regularly in speech (Sudbury and Hay 283). This particular word-internal phenomenon is considered obligatory if the usage is at a suffix boundary (Heselwood 72).

As was already stated, linking /r/ occurs exclusively in non-rhotic accents. Therefore, it may be useful to mention the historical development of rhoticity at this point. English accents are typically classified into two key groups regarding rhoticity – rhotic and non-rhotic. In rhotic accents, all written <r> graphemes are produced in speech. This category involves General American, Irish, Scottish and Canadian English. Until the Early Modern English period, all English accents used to be rhotic (Gut 78). The early settlers who left to colonize North America therefore used /r/ in all positions, hence the rhotic accent of General American (Gut 78). The accents of England, Wales, Australia, New Zealand, South Africa and selected American accents are non-rhotic (McMahon 232), meaning that <r> is pronounced only in pre-vocalic positions. In the British Isles, English began to drop /r/ under certain conditions from the 17th century onwards which is why the later colonies of England tend to be non-rhotic (Gut 78).

In some accents, the pronunciation of <r> is less consistent and oscillates between rhotic and non-rhotic. Such accents are classified as semi-rhotic, for instance Jamaican English. When <r> occurs in a final position, such as in the word *car,* it is fully pronounced. However, <r> is dropped in positions after a vowel when it simultaneously precedes a consonant, for example in the word *cart* (Graddol et al., 264).

As already mentioned, non-rhotic accents produce /r/ only under certain conditions, namely at the onset of the initial syllable or when a vowel follows, whereas it remains unpronounced before consonants and pauses (McMahon 232). Furthermore, final vowels followed by the written <r> in words such as *beer* or *hair* generally correspond to centring diphthongs, such as /ɪə/ and /eə/, while the vowels in words which cease it, for instance *bee* or *hay*, tend

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[1] The syllable boundaries are not truly shifted, although it strongly seems so.

to be close vowels (/iː, uː/) or closing diphthongs, e.g. /eɪ/ (McMahon 232). Such vowel constraint is a result of two historical changes in Early Modern English which lead to its eventual dropping in instances described above (McMahon 269). Firstly, schwa began to be added to long vowels or schwa-less diphthongs preceding /r/, such as in the word *beer* /biːr/, which resulted in the pronunciation /biːər/ (McMahon 269). Secondly, the long vowels before the added schwa were shortened, thus, /biːər/ later became /bɪər/ (McMahon 269). Therefore, it is possible to claim that with the gradual change, /r/ was able to influence the preceding vowels, such as to lengthen or diphthongize them (Kijak 411). Afterwards, /r/ began to slowly weaken, initially before consonants, later in the final position as well (McMahon240). In approximately the 18th century, this resulted in the complete loss of /r/ in those positions (Kijak 411), which helped the intrusive /r/ and linking /r/ to develop simultaneously (Heselwood 73).

The majority of the principles of connected speech mentioned above are to be found in the context of weak forms of grammatical words, which are liable to be modified in speech. For example, a sound or more sounds may be dropped (Skandera 79), either a consonant or a vowel (Cruttenden 252), such as the /h/ sound in *had* /əd/. The elision of a sound, such as /h/ in *he had been* /hiː əd bɪn/, may also enable other connected speech devices to arise, in this case namely transient /j/: /hiːⱼəd bɪn/. Besides linking and elision, which were already mentioned, assimilation of voice may take place as well. For instance, the word *has* (whose strong form is /hæz/) possesses multiple weak form variations: /həz/, /əz/ and also /s/ and /z/. The last two of them, /s/ and /z/, may alter according to the voicing of the following consonant.

1.4. Intrusive /r/

Intrusive /r/ is a vowel-to-vowel linking device similar to linking /r/ in its function. The /r/ used for linking two consecutive words (or syllables) together is called intrusive when it is not present in the spelling. The usage of such device is voluntary and not all native speakers use it (Gick 32). Gick asserts that the phenomenon is employed in non-rhotic accents that simultaneously use linking /r/ as well (32). The notion may also be supported by Vaníček, who stated that rhotic respondents from North America did not employ intrusive /r/ in their speech (Vaníček 42).

Besides enabling the connection of two words, intrusive /r/ may also be used for linking across the morpheme boundary inside words (Sóskuthy 57), as in the word *drawing* /drɔːrɪŋ/,

which may be more specifically considered to be a case of linking across the suffix boundary. Another word-internal usage of intrusive /r/ across the morpheme boundary is to be observed on words similar to *banana-y* („tasting like a banana") (Hughes 65). In those cases, even speakers who try to evade intrusive /r/ would presumably produce it as this type of words is difficult to pronounce without it (Hughes 65).

1.4.1. Acoustic features of intrusive /r/

Tuinman et al. have measured the duration and the decrease in intensity of intrusive /r/ and compared the findings to the properties of onset /r/ in two consecutive studies (Tuinman et al., Speakers differentiate /r/; Tuinman et al., Perception of /r/). In the latter study, the measurements indicate that intrusive /r/ tends to be shorter, with an average of 69 ms, than onset /r/, which lasted 89 ms on average (1645). Consequently, the intensity decrement from the preceding vowel to „the lowest point in the /r/" was assessed (Tuinman et al., Perception of /r/ 1645). Onset /r/ had a larger decrement of intensity, with an average of 7.9 dB, than intrusive /r/, whose decrement was on average 2.2 dB (1645). Thereafter, it was calculated that these differences have the potential to help listeners distinguish between the two types of the /r/ allophone (Tuinman et al., Perception of /r/ 1645).

Interestingly, intrusive /r/ possesses a few more distinctive traits which make it different from the written and pronounced /r/. Hay and Maclagan studied the formant F3 of intrusive /r/, which is the most prominent formant correlating with the regular /r/, in New Zealand English (46). The study measured the acoustic features of /r/ in the word *Sarah* in connected speech and thereafter compared them to the measurements of intrusive /r/ produced by the same speaker. In general, the intrusive /r/'s F3 were greater than the F3 in the word *Sarah* (Hay and Maclagan 54).

The results also show an interesting correlation with social class. Speakers from higher social classes generally tend to produce higher F3 when pronouncing intrusive /r/, which is then more distinct from their regular /r/ (Hay and Maclagan 54). This matter is in stark contrast with speakers from lower social classes, who tend to hold lower F3 during intrusive /r/, which may be explained by the fact that their intrusive /r/ more resembles the regular /r/ (Hay and Maclagan 54). They also produce the phenomenon at higher rates (Hay and Maclagan 58). Therefore, the study confirmed that intrusive /r/ may vary in the degree of realization according to social class (Hay and Maclagan 71).

1.4.2. Distribution of intrusive /r/

It is possible to distinguish multiple viewpoints on the frequency of distribution after certain vowels. According to Cruttenden, the most likely instance to observe this phenomenon is after schwa in a final position, such as in a phrase *Russia and China* /rʌʃər‿ən ˈʧaɪnə/ or *idea of* /aɪˈdɪər‿əv/ (288). It is also possible to witness intrusive /r/ after the long vowels /ɑː/ and /ɔː/ in final positions, for instance the notoriously known phrase *law and order* /lɔːr‿ ənd ˈɔːdə/ or *nougat and chocolate* /nuːgɑːr‿ən ˈʧɒkəlɪt/, though the frequency is lower (Cruttenden 288). On the contrary, Hannisdal claims that the occurrence is indeed more likely after long vowels /ɑː/ and /ɔː/ rather than after /ə/ in percentage (Hannisdal 176). That is in accordance with Vaníček's findings, which showed that the vowel /ɑː/ is more likely to trigger the usage of intrusive /r/ than /ə/ (Vaníček 52). Vaníček's study also showed that the speakers from the UK most frequently employed the device after the final /ɔː/ (Vaníček 52). In addition, Hay and Maclagan note that in New Zealand English, young speakers begin to use intrusive /r/ after the diphthong /aʊ/, too, for instance in the phrase *now and then* /naʊr‿ən ˈðen/ (41).

Intrusive /r/ is more likely to appear when it precedes short grammatical words, such as *is, of, and* (Hannisdal 174). The phenomenon in relation to longer polysyllabic words is relatively rare and almost absent when preceding proper nouns (Hannisdal 174). Hovever, intrusive /r/ following a name is a common occurrence (Hannisdal 174). The distribution is predominantly limited to unstressed vowels (Hannisdal 175). This may correspond to the fact that intrusive /r/ is prone to appear in monosyllabic grammatical words. If another /r/ is present in the phonetic environment, intrusive /r/ is not likely to be employed (Hannisdal 176).

1.4.3. Factors of emergence

The usage of intrusive /r/ is voluntary, as already mentioned. Therefore, certain linguistic or social factors may influence its distribution. However, there are major discrepancies among various sources. Sóskuthy mentions a number of factors that have been proposed, such as „social class, age, the lexical identity of the target word, the quality of the preceding vowel and the presence of an *r* in the onset of the final syllable" (Sóskuthy 63). Evidence has been found that speakers tend to use intrusive /r/ more frequently after specific words (Sóskuthy 63). An agreement has not been reached as regards the claim that the preceding vowel may affect the occurrence of the phenomenon (Sóskuthy 63). Social class also does not seem to

bear a major significance. Hannisdal has not been able to find any proof of the influence of social class on the distribution of intrusive /r/ (Hannisdal 172). Vaníček has later confirmed this hypothesis as well, stating that susceptibility to different variants of English has shown to be a greater influence than social class (51). The usage of the linking device was confirmed both in speech of working and middle classes (Vaníček 51). Australian speakers have been proven to use intrusive /r/ most frequently in Vaníček's study, producing the feature largely after the long vowel /ɔː/ in consonance with UK speakers who tend to do the same (Vaníček 52). However, in reference to Hay and Maclagan mentioned earlier, social class does have an impact on a degree of the realization (71). To sum up, the role of the factors influencing the emergence may still be considered to be more hypothetical than factual.

1.4.4. Different perspectives on intrusive /r/

Intrusive /r/ is a rather controversial phenomenon and the individual viewpoints from which it is possible to analyse it vary in linguistic circles. Firstly, the actual occurrence may be result of deletion, meaning that /r/ is underlyingly present in all environments following final vowels and it gets deleted in some positions (Gick 33). Secondly, intrusive /r/ may be considered inserted under certain conditions (Gick 33). Finally, the two previous points of view merge into the third which states that /r/ is underlying present somewhere but inserted elsewhere (Gick 33). The majority of recent discussions over this topic tends to opt for the insertion theory (Gick 33). Broadbent asserts that intrusive /r/ (alongside with its linking counterpart) is in fact a glide formation process and equals it to transient /w/ and /j/[2] (292). It is claimed that the acceptable descriptions of intrusive /r/ in the earlier literature are in fact „arbitrary and non-explanatory", whereas the characterization of intrusive /r/ as a glide formation offers a precise explanation of the contexts in which it occurs (Broadbent 301). All words beginning with a vowel possess an empty onset which offers a way to break the sequence of two consecutive vowels (Broadbent 292), which is demonstrated on transient /j, w/ (Broadbent 294).

On the contrary, Sóskuthy holds a diachronic point of view on the matter and treats intrusive /r/ as a „result of the analogical extension" of the words in which <r> is present, but is not pronounced, such as *scar* (Sóskuthy 55). Otherwise stated, the speakers may have

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[2] In her study she applies the equation to West Yorkshire accent.

a tendency to add /r/ after final vowels in such expressions that are similar to words where /r/ is dropped in the final position.

1.4.5. Perception of intrusive /r/

To investigate the perception of intrusive /r/, two key consecutive studies by Tuinman et al., which were already mentioned, were carried out. The results of their analysis imply that native speakers' realizations of onset and intrusive /r/ are acoustically different (Tuinman et al., Speakers differentiate /r/ 1905). However, the study has shown that ESL listeners[3] are not able to distinguish between the two and therefore, they do not possess the ability to make use of the difference (Tuinman et al., Speakers differentiate /r/ 1905. In a set of perception tests, native listeners, ESL listeners (referred to as „cross-native") and American listeners (referred to as „cross-dialect") took part (Tuinman et al., Perception of /r/ 1644, 1645). The results showed that native listeners use acoustic evidence to differentiate between intrusive and onset /r/, whereas ESL listeners, besides the /r/ duration cue, operate predominantly with semantic context (Tuinman et al., Perception of /r/ 1648). American listeners were most significantly influenced by the duration of the /r/ and also interacted with orthographical factors, without making use of the semantic context (Tuinman et al., Perception of /r/ 1650).

1.4.6. Attitudes towards intrusive /r/

Academic sources published in the 20th and the early 21st century mostly regard intrusive /r/ as being stigmatized in society to a certain degree. Wells claims that it is regularly used, but the „speech-conscious" individuals incline to treat it as inappropriate (284). Skandera notes that the usage of intrusive /r/ is frowned upon and considered improper by „language purists" (59). The stigmatization of intrusive /r/ word-internally before a suffix, for instance *strawy* /strɔːri/, is considered to be even stronger (Cruttenden 289). On the other hand, Sudbury and Hay mention that intrusive /r/ after schwa tends to be less stigmatized than after other vowels, arguing that it is „less noticed" because schwa is constantly unstressed (Sudbury and Hay 283). On the contrary, as the distribution of intrusive /r/ after /ɔː/ rose later, it is disapproved of more (Sudbury and Hay, 283). Anyhow, Skandera mentions that speakers actively try to avoid it and this effort has reached a state in which some speakers are embarrassed even about the usage of linking /r/ (59). Evading linking /r/, however, may

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[3] In the study, the perception of native Dutch speakers with a high level of proficiency in English was tested (Tuinman et al., „Speakers differentiate /r/" 1906).

be regarded as unnatural and overly correct, Skandera asserts (59). On the contrary, Hannisdal as early as in the year 2006 notices a clear change in the attitude towards the feature, arguing, among other things, that BBC newsreaders are no longer explicitly advised not to use intrusive /r/ in their speech (171). In a study, the data for which were collected at 3 various British news channels (Hannisdal 130) from the year 2002 to 2004, Hannisdal also notes that the phenomenon occurred (at different rates) in the speech of a surprising 27 newsreaders out of 30 (171).

Hughes defined the current situation regarding the occurrence of intrusive /r/ in 2013 as being „quite normal in non-rhotic accents of English in the UK" (65). He mentions that this habit has been fairly frequent when /ɑː, ɔː, ɜː, ɪə, eə, ə/ precede another vowel (Hughes 65). It is asserted that in those cases, /r/ is nowadays regularly included, often without the speaker even noticing (Hughes 65). Hughes also claims that the acceptance of this phenomenon has gone so far that the scarcity of intrusive /r/ in one's speech (in certain accents) may suggest that the speaker is not of a native origin (65). Moreover, young speakers of a standard British accent seem to be unaffected by the past stigma and are rather perplexed by the thought of it being inappropriate (Hughes 65).

1.5. Conclusion

To briefly summarize, intrusive /r/ is a linking device which functions similarly to linking /r/, however, without the grapheme <r> present in the spelling. It may be used to connect two consecutive words or morphemes word-internally (Sóskuthy 57). Intrusive /r/ is acoustically different from the onset /r/ as it is shorter (Tuinman et Al., Perception of /r/1645). Speakers from high and low social classes produce intrusive /r/ in a slightly different manner (Hay and Maclagan 71). The feature occurs after schwa and the long vowels /ɑː/ and /ɔː/ in the final positions. There are certain variables that influence the factors of emergence, however, not much clear evidence is to be found. In addition, various authors have different points of view on the matter of the occurrence processes of intrusive /r/. Native and non-native speakers perceive the feature differently when they hear it, making use of various evidence to identify it (Tuinman et al., Perception of /r/ 1648). In the past, intrusive /r/ used to be stigmatized but in the 21st century it is no longer disapproved of (Hughes 65).

2. Perception of non-native English

In the second chapter of the theoretical part, two key topics regarding the perception of foreign-accented speech, intelligibility and comprehensibility, are going to be explored in detail as they are closely linked to the research design employed the practical part.

The ability to process and understand the message of foreign speech may be affected by both phonological and lexical features in it (Levis 12). The manner in which an individual perceives the sounds of a non-native language is based on their own native language, or more specifically on its phonological properties (Gallés 546). A listener may mismatch the properties of his native language with the non-native one while perceiving speech (Gallés 547). Gallés suggests three kinds of speech illusions, which may result from this mismatch: deafness, mirage (547) and mutation (548). We speak of deafness when a speaker is unable to hear the difference between specific words, such as Japanese listeners who lack the ability to hear the difference between *load* and *road* (Gallés 547). Mirage occurs when an additional sound, not physically present in the spoken signal, is heard by the listener (Gallés 547). Mutation may appear if a listener replaces the original sound with another (Gallés 548). Gallés also mentions the matter of phonotactics in this regard, which describes the combinations of sounds that are used in different languages. Listeners are affected by the phonotactics of their native language while perceiving particular non-native consonant cluster combinations (Gallés 557), and even tend to try to change the illegal combinations into the ones which are phonotactically legal in their own language (Gallés 558).

The question may be what is actually meant when we claim that we understand. Munro and Derwing researched this concept together with the degree of accentedness and established two categories that are partially connected and at the same time independent: *intelligibility and comprehensibility*. Munro and Derwing's research defined intelligibility as the degree of listener's understanding of the meaning of a speaker's message (Foreign Accents, Comprehensibility 76). On the other hand, comprehensibility is the degree of effort a listener needs to exert in order to understand what the speaker states (Munro and Derwing, Pronunciation Fundamentals 3). In addition, *accentedness* and *interpretability* are frequently explored along with the two features mentioned above. Accentedness describes how closely a speech of L2 speakers resembles native production (Thomson 7) and interpretability evaluates the overall proposition of an utterance (Levis 334).

In conclusion, there are a handful of factors that influence the listener's understanding. The concepts of intelligibility and comprehensibility were key to the manner of obtaining data for the practical part as the types of the individual exercises were chosen to test either one or the other. The following part is going to explore the two key terms in more detail.

2.1. Intelligibility and its measuring

As already mentioned, intelligibility is defined as the degree of listener's understanding of the meaning of a speaker's message according to Munro and Derwing (Foreign Accent, Comprehensibility 76). Changes occurring in connected speech, for instance the implication of intrusive /r/, may influence the intelligibility of the native speaker to a non-native listener and vice versa (Alameen and Levis 160).

External factors, such as noise or tempo of speaking, have the potential to affect intelligibility (Levis 16). In addition, it may be influenced by an unexpected usage of word stress or segmentals by the speaker (Levis 24). It has been found that the accurate production of vowels and correct pronunciation of the initial consonant in a word bear certain significance (Zielinski 25). For non-native learners of English, the potential reduction of intelligibility may occur when vowel reduction is employed, because of the lack of grapheme-to-phoneme correspondence (Levis 24).

There are multiple ways of researching intelligibility. Munro and Derwing offer a summary of the methods. The first method involves listeners who transcribe what they hear, with a focus on the overall count of the correctly written words or at the correct keyword ratio (Munro and Derwing, Foreign Accents, Intelligibility 77). However, a detailed account of the reason why intelligibility was high or low is not offered when using this method (Zielinski 26). Besides, mistakes in transcription might be caused by various other influences, such as the distraction of the listener or difficulties in remembering or spelling the words (Zielinski 26). In contrast, the second method requires asking the listeners to restate what they hear, from which the accuracy of their statement could be assessed. (Munro and Derwing, Foreign Accents, Intelligibility 77).

2.2. Comprehensibility and its measuring

Comprehensibility is the degree of effort that must be exerted by the listener in order to understand the speaker (Munro and Derwing, Pronunciation Fundamentals 3). The focus is on the difficulty of processing the speech, emphasizing the listener's general feeling about

their degree of effort (Levis 17). As a result, comprehensibility may seem to be a subjective feature, while intelligibility is more objective. In general, listeners tend to rate their comprehensibility of a certain speaker in a quite similar manner, reaching an agreement (Munro and Derwing, The Foundations of Accent 478).

The lack of comprehensibility is not restricted to non-native speakers. It may occur in the speech of a native as well, due to inarticulateness, speech disorders or else (Munro and Derwing, Pronunciation Fundamentals 3). Deviations in the field of suprasegmentals are prone to cause a decline in comprehensibility (Levis 25). Fluency[4] is another influence as some speakers are notorious for the overuse of pauses and filler words, they may also stutter or speak too rapidly with the absence of pauses or emphasis (Levis 27). Although speech at a slow rate may lack the fluency, it should be easier to understand for non-native speakers (Levis 27). A high pitch of voice, for instance in Indian English, may also increase the listener's processing difficulty (Levis 28).

This feature is most frequently measured on a Likert scale, which enables the listeners to express their degree of effort in numbers from 1 to 9 (Levis 17).

2.3. The correlation between intelligibility and comprehensibility

Intelligibility and comprehensibility have a relatively close relationship (Munro and Derwing, Pronunciation Fundamentals 5). They have a significant correlation (Zielinski 25) while remaining independent to a certain extent (Munro-Derwing, Accent, Intelligibility 2). The degrees of the two terms may occur at different combinations, therefore, they both may be high or low, but it is possible for intelligibility to be low while comprehensibility is high and vice versa (Munro and Derwing, Pronunciation Fundamentals 6). For instance, although the listeners may perceive it difficult to understand an utterance, it does not influence their ability to successfully reproduce it (Zielinski 26). The matter is shown on table 1 which was adopted from Munro and Derwing (Pronuncation Fundamentals 6).

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[4] While a clear definition is difficult to establish, it consists of phrasing, speech rate, timing and else. (Levis 27)

Intelligibility	Comprehensibility	Result
High	High	full understanding, little effort
High	Low	full understanding, great effort
Low	Low	poor understanding, with great effort
Low	High	poor understanding, misleading feeling of little effort; uncommon

Table 1: The combinations of the degrees of intelligibility and comprehensibility (Munro and Derwing, Pronunciation Fundamentals 6).

Comprehensibility seems to be more closely connected with segmental features rather than with intelligibility, at least considering non-native English speakers and native listeners (Zielinski 25). On the other hand, comprehensibility scores are still more related to intelligibility than to accentedness, meaning that a heavy accent does not greatly correlate with reduced comprehensibility (Munro and Derwing, The Foundations of Accent 479).

2.4. Conclusion

To sum up, the key concepts of intelligibility and comprehensibility were explored in the chapter, both closely related to the practical part as answer sheets created for the purpose of the study were based on the notions of the two terms. The general perception of a non-native language is based on the native language of the listener (Gallés 546), with the possibility of a number of speech illusions resulting from a mismatch (Gallés 547). The act of understanding non-native production has several layers, including intelligibility and comprehensibility along with accentedness and interpretability. Intelligibility is more objective and may be influenced by external factors, both on the side of the speaker and on the side of the listener. It is measurable by various methods, such as transcription or restatements of the speech heard by the listener (Munro and Derwing, Foreign Accents, Intelligibility 77). Comprehensibility is more subjective. Both native and non-native speaker's speech may lack comprehensibility due to numerous factors. The most frequent measurement of comprehensibility is on a Likert scale from 1 to 9 (Levis 17). Both features have a close relationship, correlating with each other, however, they remain partially independent.

PRACTICAL PART

In the practical part of the thesis, a small-scale research study focusing on the perception of intrusive /r/ in English by non-native listeners was carried out. The perception testing involved both intelligibility and comprehensibility domains. The following hypothesis was formulated:

Czech learners of English will perceive the English speech containing intrusive /r/ as more difficult to understand than speech without its occurrence.

In other words, it is assumed that the presence of intrusive /r/ in spoken English produced by a native speaker will negatively affect both the objective and subjective understanding of the respondents mainly due to the lack of familiarity with the target phenomenon. Such a hypothesis is drawn on the general fact that intrusive /r/ seems to be unusual to encounter in non-native production. It is a rather marginal pronunciation feature that neither my classmates nor I had been familiar with prior to entering university. Furthermore, the stigmatisation discussed above may still influence its occurrence in native English. In addition, a second hypothesis was formulated taking into account the type of schools where research was conducted:

Students from a grammar school will achieve better results than those from a more technically oriented school.

The second hypothesis reflects the greater focus of grammar schools on common core subjects, including English. Technical education, on the other hand, puts emphasis on job-specific training.

3. Method

In order to determine to what extent Czech students can understand English with intrusive /r/, both intelligibility and comprehensibility perception tests were created for high school students at one grammar school and one secondary technical school. They contained sentences with and without intrusive /r/ and were administered to the respondents in two separate settings. The first test examined the degree of intelligibility, whereas the second one focused on comprehensibility. The time gap between the sittings varied from 1 to 2 weeks. Consequently, the data gathered in both schools were analysed and compared. The comprehensive description of the creation and administration of the tests is presented in this part.

3.1. The preparation of the perception test

In order to collect the data, it was necessary to create a controlled set of sentences, which were then recorded by native speakers, who were instructed to pronounce intrusive /r/ in chosen positions. Based on the recordings, the two perception tests were generated, along with the answer sheets for the students.

3.1.1. Text preparation

The text which was sent to native speakers for recording consisted of a total of 21 sentences with 14 occurrences of intrusive /r/. In addition, the speakers were asked to record 2 trial sentences, one of which contained a linking /r/. The ratio of the occurrence after specific vowels was chosen according to experts' recommendations. Intrusive /r/ after /ə/ was used 6 times as Cruttenden claims that intrusive /r/ is most likely to occur after the final /ə/ (288). However, Hannisdal opposes that the likelihood of the occurrence is higher after /ɔ:/ and /ɑ:/ (176). Taking the claim into account, intrusive /r/ after /ɔ:/ was integrated 6 times. The quantity of the words with the final /ɑ:/ is not very high and such words tend to be advanced and infrequent which made them quite unfeasible for the study. Thus, only 2 occurrences after /ɑ:/ were used. The individual phrases were chiefly inspired by Vaníček's practical part of his thesis (apart from *media event*, which was taken from Roach) and subsequently incorporated into originally formed sentences. The complete set of phrases used can be found in table 2.

As regards the relationship between the sentences, it is possible to distinguish 9 pairs. Both sentences are very similar as far as grammar and vocabulary are concerned, however, they

are not identical. The main difference lies in the presence or absence of the target phenomenon. Furthermore, one group of 3 is to be found. The complete list of sentences may be seen in the Appendices.

Given the target participants and the aim of the study, the sentences contain basic vocabulary in order not to distract the students, with the exception of the proper names of countries, continents and cultural references.

	final /ə/ (6x)	final /ɔ:/ (6x)	final /ɑ:/ (2x)
phrases	idea of extra information media event Russia and vodka and Austria are	raw eggs Law and saw it straw in draw at flaw is	bra is Utah is

Table 2: *The division of the phrases containing intrusive /r/ according to the preceding vowel.*

3.1.2. The process of recording

In the next phase it was necessary to record the sentences with and without intrusive /r/. Five native speakers were asked to read out the text and employ intrusive /r/ in selected phrases. The links between the words were marked in red. The speakers were instructed to speak rather rapidly as they would in any other colloquial speech. Furthermore, they filled a short questionnaire containing basic information about themselves.

The original intention was to obtain and use recordings from 5 speakers. However, only the recording of a 27-year-old female ethno-musicologist turned out to be suitable for the purpose of the perception tests. She sent a high-quality recording, her speech tempo was natural and most importantly, her voice gave the impression of someone kind and comforting. The 4 outstanding recordings remained unselected because of their poor quality with background echo and noise along with an inappropriate tempo of speech. One speaker failed to produce the target phenomenon and therefore had to be excluded.

The perception tests were created in the Audacity audio software (Audacity). Both contained the same recording, but the sentences were in random order. A pair of sentences containing the phrase "Utah is" had to be removed due to an audible hesitation in the recording. As a result, each perception test consisted of 21 sentences including 2 trial ones. Each sentence was repeated twice. A beep sound was used to alert students to the beginning or the end of the listening, as well as to clearly divide individual parts such as the trial. The speech tempo was slightly increased in the Audacity software (Audacity).

The two tests differed in the length of pausing. In the first perception test aimed at intelligibility, which required the respondents to write down the sentences, the interval after the first repetition lasted 10 seconds on average. The pause after the second repetition was 5 seconds. In the second perception test aimed at comprehensibility, the pauses were made shorter – 5 and 3 seconds. The participants were expected to circle a number on a scale, hence the reduced interval. In order to prevent any kind of confusion on the listeners' part, the perception test was divided into three sections that were separated by the beep sound.

3.1.3. Answer sheets

For data collection, 2 answer sheets, one for each perception test, were created. The answer sheet for the 1st sitting contained an introductory questionnaire with questions regarding age, sex, contact with native speakers, English in general and visiting English-speaking countries. The purpose of the survey was to detect whether there was any likelihood of the participants having encountered native-spoken English and, presumably, intrusive /r/. Successively, the answer sheet consisted of concise instructions and of empty double lines for writing down the sentences, including two initial examples. The first perception test was aimed at intelligibility.

Next, the answer sheet for the 2nd sitting was created, with the purpose of collecting the data about comprehensibility. It consisted of instructions and a scale from 1 to 7 for each sentence. The participants were supposed to circle or cross out a number which represented best their degree of understanding. Number 1 meant that the participants did not understand at all, whereas 7 corresponded to effortless understanding. The second perception test measured comprehensibility.

3.2. Participants

The participants were senior year students at two high schools, therefore, their level of English was supposedly between B1 an B2 according to CEFR standard. Both schools were situated in Prague, the grammar school was Arcibiskupské gymnázium v Praze and the secondary school was represented by Střední zdravotnická škola, Praha 1. A total of 52 students participated in the study by filling in at least one of the tests, however, only 44 of them completed both tests. The grammar school class consisted of 25 students, whereas the SZŠ group contained 20 participants.

In the sample of 45 students who were present for completing the questionnaire, 35 participants were female, the remaining 10 were male, with ages ranging from 18 to 21. More than a half of them had visited an English-speaking country at least once. However, only 13 participants spent more than a week there. As much as 11 students were in regular contact with native speakers of English. Most of them stated that they encounter English on social media and YouTube, along with computer games, books and friends.

3.3. Test administration and data collection

In order to determine whether the perception tests were functional and user-friendly, a pilot experiment was conducted on two high school students, a senior student of a business academy and a 3rd year student of a secondary school. Drawing on their feedback, some pauses were prolonged. Generally speaking, both students agreed that the instructions were adequate and the recordings clear.

The respondents were two different classes divided into four smaller groups. Therefore, it was necessary to make eight visits in total. The participants were given their answer sheets and asked to sign it with their full name on a stapled piece of paper, which would be removed after pairing the tests from both sittings in order to anonymize the data. Firstly, clear instructions in Czech were presented. Secondly, the students were reassured about the anonymity of their results. The participants were encouraged not to be stressed. Subsequently, the two example sentences were played. Before the test began, the students had the chance to ask about anything and adjust the volume.

Unfortunately, in one sitting the students could not hear the recording well due to the poor quality of the audio equipment in the classroom. As a result, the testing was repeated in a different session.

4. Analysis

Once the testing was finished, the two answer sheets of each participants were paired. The papers with their names were removed and each pair of tests was given a unique number. Subsequently, the results were analysed. As regards the intelligibility test, only the phrases with intrusive /r/ were taken into account, such as *Law and* or *raw eggs*, along with their counterparts without the occurrence. The rest of the sentences were not evaluated. The phrases were regarded as correct only when both words were written correctly without grammatical or spelling errors. Minor errors, for example missing capital letters, were tolerated. A correctly written phrase was rated with 1 point, an incorrect phrase scored 0 points. It was possible to score a maximum total of 13 points. All errors were marked, classified as either major or minor and counted both altogether and separately.

The analysis of intelligibility data was carried out using Excel tables. One table for all students and 1 for each school were created, to which the results of individual students were entered. It was possible to calculate the percentage of an individual's correct answers by counting how many points out of 13 the participant scored. By averaging the percentages, it was possible to assess the overall score of the whole set of data or the results of a particular school. Finally, statistical significance was calculated using Two Sample t-Test Assuming Equal Variances with a different number of observations. The difference between two sets of data is statistically significant under the condition that *p < 0.05*.

As far as the comprehensibility tests are concerned, it was necessary to enter the data to Excel tables as well in order to analyse the results. Similarly to the intelligibility part, a table for the whole set was created, along with 1 table for each school. The students' evaluations for each of 10 sentences were written down and the average number for each participant was counted, which corresponded to the perceived difficulty. The averages of the whole set and both schools were then calculated from the count of each participant. In addition, the averages for each phrase were also counted.

The same procedure was repeated with the rest of the sentences that did not contain intrusive /r/. Due to the similarity with their counterparts containing the target phenomenon, it was possible to establish a counterpart to each phrase with intrusive /r/. Subsequently, the whole set of data was compared from different points of view. The comprehensive scores of the intelligibility and comprehensibility test were scrutinized including both schools and their individual comparison. The average scores of phrases with and without intrusive /r/

were compared, as well as the overall success of the counterparts with and without the target phenomenon among individual students.

5. Results

In the following chapter, a series of analyses will be presented. Firstly, the overall success of the test with and without intrusive /r/ will be shown. Secondly, the performance of the two groups, the grammar and the secondary school, will be compared, regarding both phrases with and without the examined phenomenon. Lastly, a comprehensive analysis of individual phrases and various mistakes will be provided, along with a more detailed analysis of the students' results.

5.1. The overall results

In general, it can be claimed that the overall results of both sittings seem to be more in favour of the part without intrusive /r/. As regards the intelligibility test, in which students were instructed to write down what they hear, 77% of all cases were correctly understood when intrusive /r/ was not produced. Thirteen out of 45 students achieved 100%. In contrast, the phrases with intrusive /r/ were understood correctly in 46% of all cases, with not a single student obtaining 100%.

Concerning the comprehensibility test, in which students were asked to evaluate their degree of understanding on a scale from 1 (difficult to understand) to 7 (easy to understand), the results roughly correspond to the intelligibility findings. The average score of all students in the part without intrusive /r/ is 6.4. Interestingly, 7 students perceived the phrases as very easy to understand. The average for the part containing intrusive /r/ is lower, 5.4, with only one student perceiving all the phrases as very easy. The summary of the results is to be found in table 3.

It is necessary to remark that 3 sentences in the intelligibility part contained multiple occurrences of the target phenomenon and they were rated by students as a whole in the same manner as sentences with only one intrusive /r/ employed in them. In order to determine whether the multiple occurrence sentences were perceived as more difficult, a table in Excel was created in order to compare the average score of the multiple occurrence phrases to the average score of the single occurrence phrases, which showed no significant difference.

	phrases without intrusive /r/	**phrases with intrusive /r/**
intelligibility	77%	46%
comprehensibility	6.4	5.4

Table 3: *The overall results for the intelligibility and comprehensibility tests. The figures show average values.*

5.1.1. Intelligibility and comprehensibility results

The overall average score of the intelligibility test (with and without intrusive /r/) was 61% of correct answers. The grammar school group understood 72% of all phrases correctly, whereas the secondary school students managed to write 46% of them properly. The difference proved to be statistically significant as *p < 0.05.*

The comprehensibility part (with and without intrusive /r/) was rated 5.9 out of 7 on average. Students from grammar school perceived the difficulty on the average of 6.0. Similarly, the secondary school group's average is 5.8. The scores may be observed in table 4.

	intelligibility (average)	comprehensibility (average)
grammar school	72%	6.0
secondary school	46%	5.8
all students	61%	5.9

Table 4: *The overall results of the intelligibility and comprehensibility parts including both schools.*

5.1.2. Phrases with intrusive /r/

As far as the phrases with intrusive /r/ are concerned, the grammar school students managed to reproduce 56% of them correctly. The average comprehensibility score was 5.5 out of 7.

The secondary school students wrote 33% of the phrases with intrusive /r/ rightly and the average comprehensibility score was similar – 5.4. The difference between the schools in the intelligibility test proved to be statistically significant (*p < 0.05*). See table 5 with intrusive /r/ results of the groups below.

	intelligibility (average)	comprehensibility (average)
grammar school	56%	5.5
secondary school	33%	5.4

Table 5: *The results of both schools in the intelligibility and comprehensibility parts with intrusive /r/.*

5.1.3. Phrases without intrusive /r/

The phrases without intrusive /r/ seem to have better scores in general. The grammar school group successfully transcribed 90% of the words correctly and the respondents rated them as very easy to understand – 6.6 points out of 7 on average. Thus, it is possible to observe a correlation between their performance and subjective perception of the target feature.

Regarding the secondary school students, fewer phrases were written correctly – 60%. However, their comprehensibility score turned out to be rather high with an average figure of 6.1 points (see table 6). Similarly to the previous analysis, there is a discrepancy between the students' perceived ease of understanding and their real performance, in which they

struggled to understand all words. The results turned out to be statistically significant as $p < 0.05$.

	intelligibility	comprehensibility
grammar school	90%	6.6
secondary school	60%	6.1

Table 6: *The results of both schools in the intelligibility and comprehensibility part without intrusive /r/.*

5.2. The linguistic analysis of the results

Based on the overall intelligibility of the phrases with intrusive /r/, it was possible to divide them into three intervals according to how well the students were able to recognize them (see figure 1). The least successfully understood phrase was *Law and,* which was written down correctly by only 11% of students. The phrase *flaw is* followed with the average score of 13%. *Bra is* was also problematic as only 18% of all students managed to write the phrase correctly. On the contrary, in the phrases *draw at, saw it* and *extra information*, the success level was significantly higher. *Saw it* and *extra information* were written correctly in 78% of the cases, *draw at* was properly understood in 73% of instances.
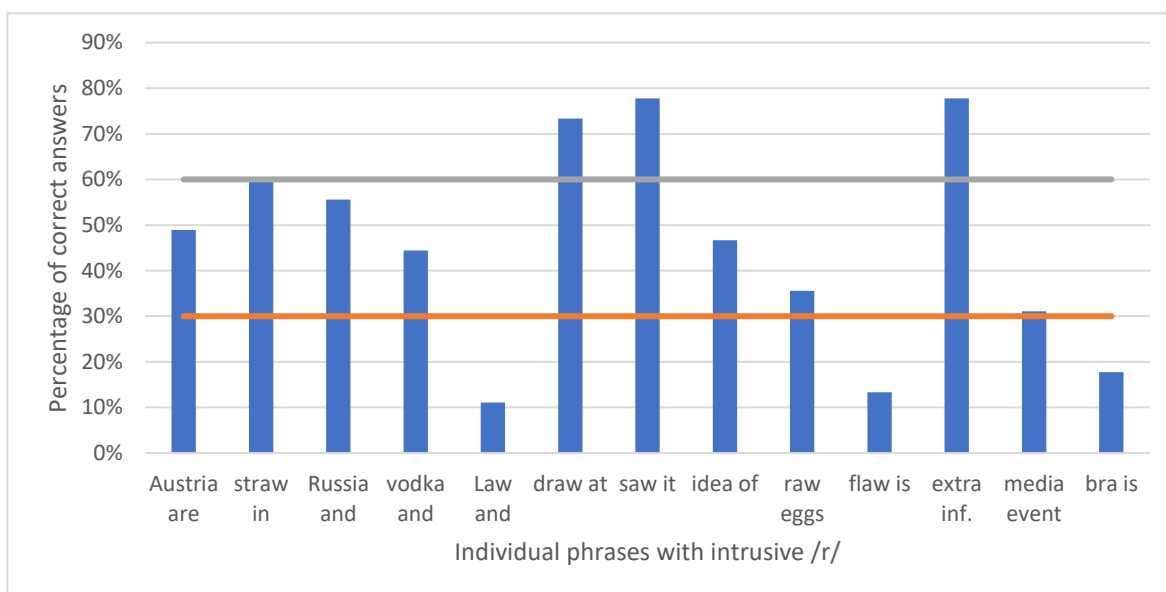

Figure 1: *The correct answers of all students in percentages – individual phrases with intrusive /r/.*

For comparison, all phrases without intrusive /r/ exceeded the average 60% of successful answers with the exception of the phrase *purpose of*, which only 53% of all students managed to write correctly. The two phrases with the highest average 93% of correct understanding were *problem* is and *final test.* The results were again divided into three identical intervals

as was previously done with the phrases with intrusive /r/. For the graphical representation of the results, see figure 2.
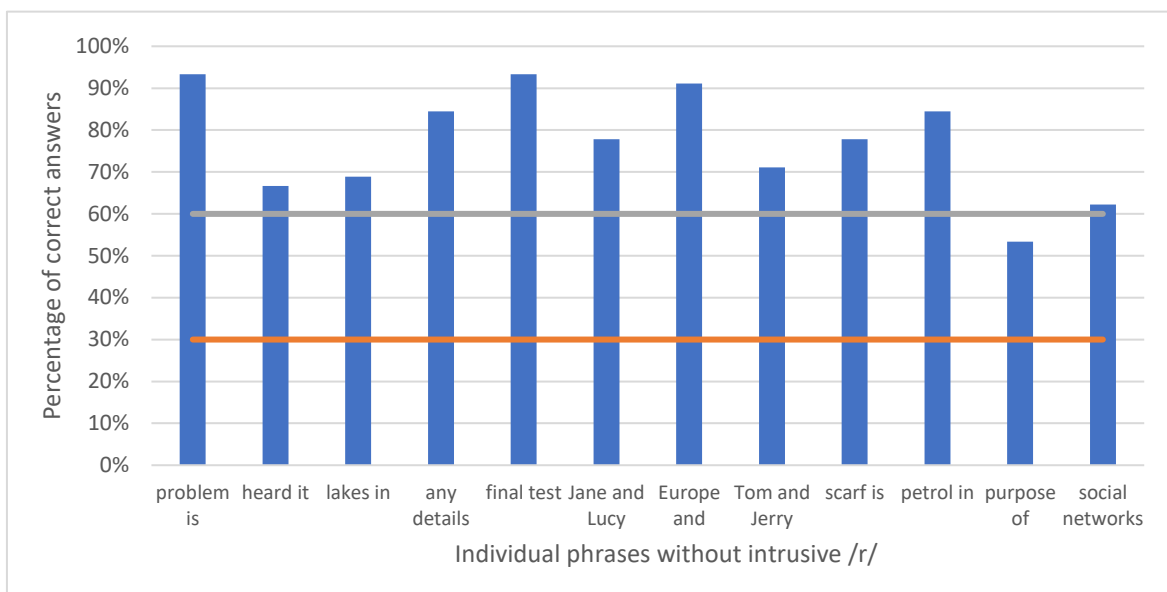

Figure 2: The correct answers of all students in percentages – individual phrase without intrusive /r/.

As far as the individual phrases with intrusive /r/ are concerned, the comprehensibility results do not show big differences. The average score of every sentence is in the interval of 4 to 6. The results of the comprehensibility part without intrusive /r/ are similarly homogenous, however, the scores are slightly higher, each in the interval from 6 to 6.8, except the phrase *heard it*, which was evaluated with 5.9 on average.

5.2.1. Mistakes in the intelligibility part

In the intelligibility part of the test, the students made a total of 318 mistakes out of 585 possible instances in the phrases with the occurrence of intrusive /r/. Most of them, 296, were classified as major mistakes, meaning that the students left the space blank or wrote something completely different. Frequently, they tried to insert the /r/ sound into the phrase in some way, which indicates that the students were aware of the sound, however, they were not sure how to cope with it due to the lack of familiarity. For instance, *flaw is* was reproduced as *floor is* two times, or *saw it* was written as *sored it* or *sore it*. This tendency can be best represented by a student who wrote *media revent* instead of *media event*. This phrase was also perceived as *new year event* twice. The spaces where *bra is* and *flaw is* were supposed to be written were frequently left blank.

The phrase *Law and Order* was proved to be the most difficult one for the students to understand, therefore, students made many various mistakes. This phrase is typically associated with the former British prime minister Margaret Thatcher, who used *law and order* with the /r/ insertion so frequently that she was jokingly referred to as Laura Norder, which sounds similar (Rogers 74). The wrong answers of the students were similar to the Laura Norder reference to a certain degree. A single word *Laura* was written twice and various combinations also occurred, such as *Lara and Older* or *Laura and Daughter*, which was used four times. Other wrong answers were similar in sound, too, for instance *Laur and Oldo, Laurel, Loar and Daughter, Lauren's daughter, Lauren and Daughter, my daughter* or *Northern Daughter*.

The count of the minor mistakes was much lower. Only 22 minor mistakes were detected, either of the grammatical or lexical nature. The most frequent mistake was *Russian and* instead of *Russia and*, which occurred eight times. The word *information* was spelled *information*s three times. Students also forgot to add the plural to the word *egg* twice. The usage of a wrong past form of a verb *drawed* instead of *draw* also occurred, as well as other minor spelling mistakes, such as *Rusia* instead of *Russia.*

The mistakes in the phrases without intrusive /r/ did not show any relevant tendencies as they were rather incidental and less frequent.

5.3. The results of individual students

As regards the intelligibility part containing intrusive /r/ occurrences, the results of all students were divided into three intervals in the same manner as the analysis of the individual phrases. The intervals of 0-30%, 31-60% and 61-100% were established. Out of the 45 respondents, 10 of them scored 0-30% (1 of which belongs to the grammar school group). The majority of them, 21, reached 31-60% (15 students were from the grammar school group). The remaining 14 students reached the highest scores between 61-100% (9 belonged to the grammar school group).

The intelligibility part without intrusive /r/ was divided into intervals in the same manner. In contrast to the phrases with intrusive /r/, 33 students out of 45 managed to get 60% or more of correct answers (see table 7). The remaining 11 kept their results in the interval of 31-60% with only one student scoring 17%.

	with intrusive /r/	without intrusive /r/
0-30%	10	1
31-60%	21	11
61-100%	14	33

Table 7: *The results of individual students in the intelligibility part with and without intrusive /r/ with the division to 3 intervals.*

The results of the comprehensibility part of all students with intrusive /r/ showed that the individual averages vary in a range of 3.5 to 7.0. The scores seem to be equally spread within the interval, therefore, the division did not appear necessary.

By comparison, in the comprehensibility part without intrusive /r/, the interval of the average answers of all students is smaller, with the scores varying from 4.8 to 7. In addition, the results seem much more homogenous, with the majority of scores exceeding 6.

5.3.1. Intelligibility and comprehensibility differences in the set with intrusive /r/

In order to be able to compare the intelligibility and comprehensibility scores of the individual students, it was necessary to change the average number that they chose on the scale to a percentage. For instance, student number 1 evaluated the phrases with intrusive /r/ with the average of 6.6, therefore, their comprehensibility percentage number is 94% (taking into account that 7 equals to 100%). Consequently, the student's average percentage of correct answers in the intelligibility test, which is 46% in this case, is taken into account. The greater the difference between the two numbers is, the greater the discrepancy between their perceived difficulty and the real performance. In order to obtain a reasonable and easily understandable number which would function as a coefficient, the result of the subtraction was multiplied by 10. If the result is a positive number, it indicates that their perceived understanding was higher than the objective one. If the result is a negative number, the interpretation goes vice versa, hence the student objectively understood better than they perceived.

Based on the numbers that resulted from comparing the percentages of the intelligibility and comprehensibility tests, 3 different intervals were created. Firstly, students in interval 1 had less than 20% difference between the intelligibility and comprehensibility percentage. Secondly, interval 2 contains students with 21% to 49% difference. Lastly, students in the remaining interval 3 had 50% and higher difference in their percentages. In order to

present the information as clearly as possible, a table with the individual intervals was created. See table 9 below.

	range	percentage (% comprehensibility - intelligibility)
Interval 1	-1.99 to 1.99	less than 20% difference
Interval 2	-2 to -4.99, 2 to 4.99	21% to 49% difference
Interval 3	-5 to -10, 5 to 10	more than 50% difference

Table 8: *The intervals established according to the ranges of coefficients and the corresponding differences in percentages.*

According to such assessed intervals, 34% of students fall within the interval 1, 40% of them in the interval 2. The interval 3 contains the remaining 26% of students. For a detailed account, see table 10.

	number of students	percentage of students
Interval 1 (<20%)	12	34%
Interval 2 (21-49%)	14	40%
Interval 3 (>50%)	9	26%

Table 9: *The division of students to the interval according to their coefficient and their ratio in percentage.*

Excluding the students in interval 1, who did not show a big discrepancy, the coefficients of all 23 students in interval 2 a 3 were positive numbers. In other words, apart from interval 1, there is a tendency of students to perceive the sentences with intrusive /r/ as fairly easy, however, the intelligibility test showed that in reality, they did not understand as well as they thought.

5.3.2. Selected results of individual students

Concerning the success in the intelligibility test and in both of its respective parts, Student 13 achieved the best results, scoring 100% in the part without intrusive /r/ and 92% in the part with it, reaching the overall score of 96%. What is interesting about this student is the fact that this 18-year-old female has never visited an English-speaking country nor has a regular contact with native speakers. She asserted that she encountered English on YouTube, social media and in books. It seems that the student may be extraordinary talented and/or extremely diligent.

If we look solely at the intelligibility part of the test with intrusive /r/, 3 students with numbers 2, 9 and 18, all from grammar school, scored 85%. They made as little as 2 mistakes. Student 2 is a male, 18 years old, who has not visited an English-speaking country, nevertheless, he claimed to be in everyday contact with native speakers of English and beside

friends, Student 2 encounters English on social media, in books, computer games and television. Thus, it seems that the student deals with English on a daily basis in various circumstances, therefore, the possibility to encounter intrusive /r/ is rather high. Student 9, an 18-year-old female, spent 2 weeks in Great Britain, however, she does not communicate with native speakers frequently. She encounters English on social media and in books, the good performance may therefore be caused by her daily contact with English there. Student 18 is a female, 18 years old. She spent a month in the United States but has zero contact with native speakers and encountered English on social media and in books. Her results might be caused by her residence in the United States, however, the probability of encountering intrusive /r/ in that area may be lower than in the Great Britain as rhotic accents prevail in the United States. Nevertheless, such experience may have enhanced her abilities to understand native English speech.

In contrast, Student 37 achieved 17% of correct answers in the intelligibility part without intrusive /r/ and 8% in the other, with 12% being the overall score. The relations to English are surprisingly very similar to student 13, the 19-year-old female also has not visited any English-speaking country and nor does she maintain regular contact with native speakers of English. She claimed to use and encounter English on YouTube and social media. According to such information, the performance may be a result of the lack of familiarity with British accent and spoken English in general.

Regarding the differences between the individual students' intelligibility and comprehensibility test, Student 24 reached a coefficient of 0.08, meaning that the student's evaluation of the difficulty of the phrases is very similar to the objective performance. The 18-year-old female scored an average of 69% in the intelligibility test, while evaluating it with 70% in the comprehensibility part. Student 24 has visited Great Britain once for 2 weeks and talks to her friends, who are native speakers of English, on a daily basis. Therefore, she may be respectably advanced in English and therefore able to perceive the difficulty accordingly.

In contrast, a coefficient 7.16, which was scored by Student 40, is the highest among the study. The 19-year-old female wrote 15% of her answers in the intelligibility test correctly but evaluated her subjective understanding at 87%. The student has not visited any English-speaking country nor talks to native speakers of English, encountering English solely on social media, in TV and in computer games. Such means of contact with English

are very similar to more successful students. Therefore, it does not seem clear why such a discrepancy occurred.

CONCLUSION

The primary focus of this thesis was the complex phenomenon of intrusive /r/ which may be detected in the production of some native speakers and its perception by non-native speakers of English. In order to lay the ground for practical research, the theoretical part was chiefly focused on the nature of connected speech processes with a special attention paid to linking /r/, which seems to be the closest to the target phenomenon in its essence. Intrusive /r/ was closely scrutinized from multiple perspectives, including the current research and the known principles of its perception by listeners. Subsequently, the two vital domains of understanding spoken language, intelligibility and comprehensibility, were explored, along with the means of measuring them.

The practical part of the thesis includes a small-scale research study on the senior year students at two high schools. Its key aim was to determine whether the presence of intrusive /r/ has an impact on the comprehension of an utterance by a non-native speaker unfamiliar with the phenomenon. The hypothesis, which assumed that English speech employing intrusive /r/ will be perceived as more difficult to understand than speech without the occurrence by Czech learners of English, could neither be confirmed nor rejected. From the intelligibility point of view, it appears that intrusive /r/ may be a factor that has a tendency to influence the degree of understanding to a certain extent. The phrases without intrusive /r/ were more successful among the students, as 77% of them was interpreted and written down correctly, as opposed to 46% of properly understood phrases with intrusive /r/. In addition, it is observable that the average numbers of correct answers for the individual phrases with intrusive /r/ are in a slightly wider interval, from 11% to 78%, than those without the target phenomenon, whose interval was from 53% to 93%. However, it is vital to consider that certain variables such as the familiarity of the students with the words in the tested phrases and the frequency of their use in English may significantly influence the results.

In contrast, the set of data from the comprehensibility test shows less divergence between the two sets as phrases without intrusive /r/ were marked on a scale with 6.4 on average and phrases with the target phenomenon were evaluated with an average of 5.4. Such results could imply that the listeners tend not to perceive a considerable difference in the phrases where intrusive /r/ is employed. The tendency may also be shown in the difference between the subjective and objective understanding of individual students regarding the phrases with

intrusive /r/. As many as 23 out of 35 of them had more than 21% difference between the two parts, always in favour of the comprehensibility section. What is more, 9 students showed a difference that exceeded 50%. Such observations may suggest that the students objectively struggled to understand the phrases with intrusive /r/ to some extent for various reasons, although, this is for some reason not reflected in the field of their subjective perception.

According to the second hypothesis, it was assumed that students from grammar and technical school may perform differently. Based on the results drawn from the comparison of the scores of students from the grammar and secondary school, it was possible to confirm that in general, students from the grammar school achieved better results. Concerning the data from the whole intelligibility test, the participants from grammar school achieved an average of 72% correct answers, whereas the secondary school students' score was lower, at 46%. The averages of correct answers in the two respective parts roughly correlated with the overall intelligibility test results as far as the difference between the two schools is concerned. On the contrary, the results of the comprehensibility test seem to contradict the expectations. Despite the difference in the intelligibility part, the comprehensibility data from both schools show little contrast. The participants from the grammar school evaluated their understanding by 6.0 on average, the secondary school students' average shows a similar number: 5.8. It seems that the subjective perception is somewhat constant and does not correlate with the objective understanding.

It appears that intrusive /r/ plays a certain role in understanding native production. Concerning teaching implications, it should be convenient to mention and briefly explain this phenomenon to respectably advanced learners of English. Teachers may remark that learners may hear intrusive /r/ in the speech of some native speakers. The awareness of the phenomenon may reduce the confusion of learners listening to native production containing intrusive /r/. In addition, the collection of authentic emergences of intrusive /r/ in native speech might serve as a useful source for pronunciation activities.

As for the research limitations, the study was carried out on a small scale with a limited number of respondents in a school environment full of distractions. Furthermore, the recordings used were not an account of casual speech and the employment of intrusive /r/ in them was conscious, therefore, they may differ from what a listener is going to encounter in reality. Future research with a larger number of respondents in a more controlled environment might show more accurate results.

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APPENDICES

Appendix 1. The instructions given to the native speakers for recording.

Thank you very much for being willing to participate in research for my bachelor thesis. Your effort will help me immensely and I deeply appreciate it. Should you be interested in any further details about my work, please do not hesitate to contact me, I will be thrilled!

Instructions for recording speech

Please, make sure you are in a quiet place without any unnecessary noises. It is vital for the recordings to be the highest quality possible. The recordings of your speech are going to be used as a part of a perception test for high school students.

The text consists of the total of 22 sentences. The first 2 are supposed to be a warm-up (for you as well as for the students), the next 20 will be a subject to my study. You can familiarize yourself with the text before recording yourself if it is more comfortable for you.

The thesis is focused on a rapid colloquial speech feature. Therefore, it is desired you read the text the same way you would speak to your friends in a common informal interaction. It is very welcome if you speak faster and in an informal manner. Please, try to sound as natural as possible, it is undesirable that you speak carefully and slowly. Doing so would not give the results that I am after, therefore, I will not be able to use the recording for testing. Nobody is going to judge your pronunciation in any way!

Once you have finished recording, please send the whole file to my e-mail: ctvrteckova.lenka@seznam.cz. Should you find the recordings too big in size, it is possible to use some other way of sharing files such as http://sharegadget.com/ or https://ulozto.net/. In that case, please send the link to my e-mail mentioned earlier.

Your participation is **anonymous**. I will not provide your name or any other personal details to **anybody**.

Sentences for recording

1) My mother comes from work earlier on Fridays.
2) I have a special plan for tonight.
3) The idea of eating raw eggs is disgusting.
4) The purpose of social networks is clear.
5) I didn't find any extra information on this media event.
6) We don't know any details about the final test.
7) Russia and Ukraine are famous for vodka and churches.
8) Germany and Austria are known for sausages and beer.
9) Jane and Lucy have gone to Europe and Asia.
10) Law and Order is my favourite TV show.
11) Tom and Jerry are two cartoon characters.
12) Yes, I saw it in the park.
13) No, I heard it from the outside.
14) The bra is in the washing machine.
15) The man is in the living room.
16) There is no straw in your drink.
17) There is no petrol in your car.
18) I have no idea where Utah is.
19) He has no idea where his friends are.
20) I used to draw at high school.
21) She went to see the lakes in Canada.
22) The only flaw is that America is big.
23) The main problem is that the supermarket is closed.

Thank you once again for your help!

Lenka Čtvrtečková

Appendix 2: The answer sheet for the intelligibility test.

Questionnaire – ANSWER SHEET 1

Age _____   Sex _____   How long have you been learning English? _____ *years*

Have you ever been to an English-speaking country? **YES / NO**

      If **YES**, where and how long? _____

Do you often talk to native speakers of English? **YES / NO**

      If **YES**, how often and to whom? _____

Where do you use English? (you can circle more options): *family – friends – YouTube – social media (FB, Twitter, Instagram…) – TV – computer games – books – other (please specify)*_____

INSTRUCTIONS

You will hear **21 sentences** including two examples. You will hear each sentence **twice**. **Please write what you hear.** If you don't know or can't understand, don't write anything or write only the part you understood. It´s perfectly OK not to understand everything. This is NOT an exam and your answers will be processed anonymously. The results will not be shown to anybody.

Example 1

_____

Example 2

_____

   1) _____

       _____

   2) _____

       _____

   3) _____

       _____

   4) _____

       _____

5) _____

   _____

6) _____

   _____

7) _____

   _____

8) _____

   _____

9) _____

   _____

10) _____

   _____

11) _____

   _____

12) _____

   _____

13) _____

   _____

14) _____

   _____

15) _____

   _____

16) _____

   _____

17) _____

_____

18) _____

_____

19) _____

_____

Appendix 3: The answer sheet for the comprehensibility test.

(the numbers of the sentences were added by hand)

ANSWERSHEET 2

In this exercise, you will hear **21 sentences** including two examples. You will hear each sentence **twice.** Please evaluate how well you understood each sentence on the scale from 1 to 7. Number 1 means that it was very **difficult to understand** and number 7 means that it was very **easy to understand**. **Circle or cross out the number** that best describes how well you understood. There is no wrong answer. The results will be processed anonymously.

Example 1

1 very DIFFICULT to understand	2	3	4	5	6	7 very EASY to understand

Example 2

1 very DIFFICULT to understand	2	3	4	5	6	7 very EASY to understand

---

1 very DIFFICULT to understand	2	3	4	5	6	7 very EASY to understand

1 very DIFFICULT to understand	2	3	4	5	6	7 very EASY to understand

1 very DIFFICULT to understand	2	3	4	5	6	7 very EASY to understand

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