Filozofická fakulta Univerzity Palackého

Interlanguage Speech Credibility Benefit: Does Czech-accented English sound more credible to Czech rather than native English listeners?

(Diplomová práce)

2014 **David Petráž**

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David Petráž

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Abstract

Non-native speakers of English who either share or do not share the native language background were evidenced to experience a benefit in intelligibility when communicating with each other, as compared to their communication with native English speakers. This phenomenon is called 'the interlanguage speech intelligibility benefit'. Another finding relevant to this thesis is that non-native speakers were proven to sound less credible to native listeners than native speakers do due to increased processing difficulty of the non-native-accented signal. In this thesis, I conduct two experiments based on the two aforementioned findings. Experiment 1 looks into the factor of processing fluency of Czech- and native-accented English speech for Czech and American listeners. Based on the assumption that an advantage in intelligibility for a non-native talker-listener pair projects itself into a benefit in credibility as a result of unimpaired processing fluency, I hypothesized for Experiment 2 that Czech speakers of English would be at least as credible to Czech listeners as native American listeners, and that Czech-accented speech would be more credible to Czech listeners than to native American listeners. Thus, this thesis focuses on an alteration of the interlanguage speech intelligibility benefit and aims to explore credibility of English- and Czech-accented speech for native American and Czech listeners. The results of the experiments indicated that both comprehensibility and credibility of Czech-accented speech were indeed much lower for native American listeners than comprehensibility and credibility of English-accented stimuli were. The Czech listeners gave the Czech-accented stimuli comparable comprehensibility and credibility scores as they did to English-accented statements. However, they did not demonstrate any significant advantage over American listeners in their trust towards Czech-accented sentences.

Keywords

Foreign accent, intelligibility, comprehensibility, credibility, processing difficulty, interlanguage speech intelligibility benefit

Anotace

Dva nerodilí mluvčí, kteří buď sdílejí nebo nesdílejí rodný jazyk, si mohou být vzájemně srozumitelnější, než kdyby jeden z nich komunikoval s rodilým mluvčím. Tento jev je nazýván "interlanguage speech intelligibility benefit". Dalším zjištěním, které je relevantní pro tuto práci je fakt, že nerodilí mluvčí zní rodilým posluchačům méně důvěryhodně jakožto následek větších obtíží při zpracovávání akcentovaného signálu. Na základě těchto dvou zjištění v této práci provádím dva experimenty. Experiment 1 zkoumá plynulost zpracování česky akcentované a rodilé anglické řeči českými a americkými posluchači. Pro Experiment 2 se na základě předpokladu, že se ona výhoda ve srozumitelnosti dvou nerodilých mluvčích projeví jako výhoda ve vzájemné důvěryhodnosti jakožto důsledek neztíženého zpracování signálu, domnívám, že čeští mluvčí angličtiny budou pro české posluchače alespoň stejně důvěryhodní jako američtí mluvčí. Dalším předpokladem je, že česky akcentovaná angličtina bude důvěryhodnější pro české posluchače než pro americké. Výsledky experimentů ukázaly, že srozumitelnost i důvěryhodnost česky akcentovaných promluv byly pro americké posluchače opravdu nižší než srozumitelnost a důvěryhodnost rodilé anglické řeči. Čeští posluchači považovali česky akcentované promluvy za podobně srozumitelné a důvěryhodné jako rodilou anglickou řeč. Neprokázali ale žádnou výraznou výhodu nad americkými posluchači v důvěře k česky akcentovaným tvrzením.

Klíčová slova

Cizí akcent, srozumitelnost, důvěryhodnost, ztížené zpracování signálu, interlanguage speech intelligibility benefit

Abbreviations

AOL	-	Age of learning
CP	-	Critical period
CzL	-	Czech listener
HP	-	High-proficiency
L1	-	First, native language
L2	-	Second language
LF	-	Listener factors
LOR	-	Length of residence
LP	-	Low-proficiency
ML	-	Mixed-native-language-background listener
NL	-	Native listener
NLB	-	Native language background
NN	-	Non-native
NNL	-	Non-native listener
NNS	-	Non-native speaker
RT	-	Reaction time
SNR	-	Signal-to-noise ratio
SP	-	Stimulus properties
SRT	-	Speech reception threshold

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1. INTRODUCTION

Nowadays that English has become a principal language used in business and political negotiations and also in other communicative contexts all around the globe, it is important that individual interlocutors do not have problems understanding each other even when they come from different regions of the world and are not native speakers of English. Native and non-native interlocutors may experience difficulties with mutual intelligibility when engaged in conversation with each other, especially when the non-native speaker's English proficiency is not very high. However, when a non-native speaker comes in communicative contact with other non-native speakers, they may in fact experience an advantage in mutual understanding, especially if the two non-natives share the native language background. This phenomenon is called 'the interlanguage speech intelligibility benefit'.

The subject of this diploma thesis is an alteration of the intelligibility benefit, i.e. an advantage that could be called the interlanguage speech *credibility* benefit. Accented speech is, usually subconsciously, deemed as less trustworthy by native listeners, either due to higher processing difficulty and (or) due to prejudice native listeners hold against non-standard-accented speech. Nevertheless, non-native listeners do not have to experience problems with intelligibility when listening to other non-natives and thus there should not be much of processing difficulty. Moreover, two non-native talkers are not likely to hold any prejudice against each other if they come from the same native language and cultural background. Therefore, the credibility of non-native-accented speech to non-native listeners should not be harmed.

To discover whether there is such a benefit caused by unimpaired processing fluency for Czech listeners perceiving Czech-accented English, I conduct two experiments as part of this thesis. Experiment 1 investigates perceived difficulty of understanding Czech-accented English and native-accented English speech by Czech and native

American listeners, and measures the listeners' reaction time to the stimuli. I hypothesize that native American listeners will take more time to process the Czech-accented statements than sentences produced by native American speakers, and that the American listeners will rate the Czech-accented statements as more difficult to understand than the English-accented stimuli. Czech listeners are expected not to show any detriment in processing fluency of the Czech-accented utterances. Experiment 2 investigates credibility of the same statements as rated by another group of Czech and American listeners, but also by other non-native listeners from various native language backgrounds. I hypothesize that the American listeners will believe the Czech-accented statements less than native English stimuli. I further expect that the Czech listeners will not indicate decreased credibility for the Czech-accented statements and will judge them as at least as credible as native English utterances. Furthermore, the Czech-accented stimuli should be more credible to Czech listeners than to native American listeners. The mixed-group listeners are supposed to show a similar credibility pattern to the Czech listeners. Thus, this research should shed some light on how Czech English-speaking interlocutors are perceived by (non-) native English listeners around the world in terms of their competence and trustworthiness.

Two works serve as the cornerstone of the presented research. These are Bent and Bradlow's "The interlanguage speech intelligibility benefit" (2003), and Lev-Ari and Keysar's "Why don't we believe non-native speakers? The influence of accent on credibility" (2010). Bent and Bradlow (2003) coined the name for the intelligibility benefit and conducted the first thorough and consistent research into it. Lev-Ari and Keysar (2010) investigated the negative impact of variously-foreign-accented speech on credibility to native American listeners as a result of increased processing difficulty.

The first part of this thesis will provide an overview of literature concerning the topic. Firstly, basic principles of second language acquisition will be outlined. Secondly, research which looks into the phenomenon of the interlanguage speech intelligibility benefit will be introduced and discussed. Thirdly, studies that analyze

the role of accent in discrimination and prejudice against non-native speakers, especially the phenomenon of reduced credibility and reliability, will be presented. The final part of the thesis comprises the actual perceptual experiments described above. The goals and hypotheses of the research are outlined in more detail and the methodology of the research is described. The interpretation and implications of the results follow.

2. LITERATURE REVIEW

2.1. Accent in second language acquisition

This chapter will briefly introduce the process of the second language acquisition (SLA) and factors related to it. Explanations for foreign accent emergence in speech will be provided and principal factors influencing the degree of foreign accent in English outlined.

English has been spoken in all inhabited continents of the world and its importance has still been growing for a few past decades. Nowadays, it can be spoken as a first native language, second language, or as a foreign language (Melchers and Shaw, 2003, p. 7). The English intercommunication can then comprise not only a native speaker (NS) speaking to a native listener (NL), but also a combination of non-native (NN) and native interlocutors, and, very commonly nowadays, two NN interlocutors. Almost everybody who does not speak English as their native language (L1) but acquired it as a second language (L2), speaks it with a foreign accent. The accent is usually salient to both NLs and non-native listeners (NNLs).

2.1.1. What gives rise to an accent

Accent in English is defined as "divergences from English phonetic norms along a wide range of segmental and suprasegmental (i.e., prosodic) dimensions" (Flege, 1995, p. 233). In the case of Czech-accented English, on which the research of this thesis is focused, such divergences may include for example a substitution of consonants (e.g. /w/ realized as /v/), absence of aspiration in voiceless stops, absence of the /ɛ/-/æ/ contrast, misplacement of stress, monotonous delivery, etc. (Šimáčková and Podlipský, 2012).

A number of different explanations have been proposed as to what specifically gives rise to an accent during the SLA process. As Flege (1995) summarizes, the inability

to produce the sounds of a language in a standard way can be a consequence of reduced neural plasticity as a result of neural maturation. Another reason might be inaccurate perception of L2 sounds, inadequate phonetic input, insufficient motivation, or even psychological reasons for wanting to retain the foreign accent (p. 234). A considerable body of research is dedicated to the issue of neural plasticity reduction.

2.1.1.1. Critical period hypothesis

It is believed that once a person passes a certain age, it is impossible for them to learn novel phonological contrasts (Lenneberg, 1967; Scovel, 1988). This theory thus presupposes a certain critical period (CP) for the acquisition. If an individual learns the phonology of a second language before the CP, there is a high chance of attaining native-like pronunciation. If, on the other hand, the learning starts after the period is over, the chances to ever speak the language without a foreign accent are very low (Piske et al., 2001, p. 195). The CP was suggested to start at the age of two and end at around puberty (Ioup, 1995, p. 48). There is indeed clear evidence that early L2 learners are able to acquire non-accented pronunciation (Oyama, 1976). On the other hand, Flege et al. (1995) showed that there does not seem to be any abrupt change in the ability to acquire L2 pronunciation at around the age of puberty (p. 234-235). Thus, the age of acquisition does certainly play a significant role for the degree of foreign-accentedness of the learner, but rather than a *critical* period after which the attainment of native-like pronunciation is impossible, there seems to be a *sensitive* period during which it is simply easier to master the phonology of an L2 (Piske et al., 2001, p. 196).

2.1.1.2. L1 transfer and models of assimilation

A complementary theory explaining how an accent originates and why it is dependent on age is the construct of transfer, i.e. the ever-present effect of the L1 on the phonology of a newly learned L2. It has been suggested that the degree of one's accent stems from the nature and the extent of interaction between the L1 and L2 phonological systems (Piske et al., 2001, p. 196). Piske et. al (2001) add that, age

being an index of the state of development of the L1 system, "the more fully developed the L1 system is when L2 learning commences, the more strongly the L1 will influence the L2" (p. 196). This in fact goes hand in hand with the critical, or rather sensitive, period hypothesis.

Ioup (1995) briefly introduces four most influential models that endeavour to explain the nature of the perception and production difficulties caused by the interference of the two phonological systems. Best's (1994) *Perceptual Assimilation Model* takes into account both perception and production factors. This model supposes that an infant establishes the L1 categories at an early age by learning to articulate them. NN phonemic categories that are later perceived in an L2 are assimilated to the native categories based on their articulatory similarity. The more the NN sound can be assimilated to the native category, the easier it will be to perceive and consequently acquire. On the other hand, if two different NN sounds are perceived as one native sound, the acquisition will be very hard. Kuhl's (1992) *Native Language Magnet Model* is preoccupied only with perception. It assumes the existence of certain phonetic prototypes established by an infant which are idealized representations of native phonetic categories. When a NN sound similar to a native phone is perceived, the prototype acts like a magnet which forces the listener to perceive the sound as the prototype. Flege (1995) developed his *Speech Learning Model* arguing that the ability to produce novel sounds remains intact while it is the perception that changes with age. An early learner is able to discern phonemic contrasts better because the perceptual categories of their L1 are not as firmly fixed as the late learner's ones are. Furthermore, Flege's model suggests that the bigger difference between the perceived NN sound and the native category sound there is, the easier it will be to learn it. In other words, the learner is more likely to notice such a NN phone and therefore there is a higher chance of acquiring it correctly. When, on the other hand, a NN phone is perceptually very similar to a native sound, it can easily remain unnoticed and, as a result of that, be produced incorrectly. This divergence will then contribute to the degree of foreign-accentedness of such a speaker.

2.1.2. Factors affecting the degree of foreign accent

Besides the learner's age, there are other factors that may influence the degree of foreign accent such as language learning aptitude, gender, motivation, or formal instruction (Piske et al., 2001). Their effect was, however, not proven strong and consistent. The influences that are, on the other hand, significant will be briefly introduced in this section. Having been said that the L1 phonological system serves as a strong influence to the system of L2, it does not sound unreasonable that the amount of L1 use should have a direct effect on the degree of a foreign accent in L2. This was indeed proven by Piske et al. (2001) who tested the participants' degree of Italian accent in English as a function of the amount of their use of Italian (their L1). The effect of the L1 use was reported to be significant both for early and late learners. Thus, even learners who acquired the L2 phonology well before the putative CP do not have to avoid speaking the L2 with a foreign accent.

Another factor that has been given a lot of attention is the speaker's amount of experience with L2, usually operationalized as the length of residence (LOR) in the country where the L2 is spoken predominantly. However, as Piske et al. (2001) summarize, the effect of this variable has not been consistently proven. Some studies showed that the LOR plays a role in the degree of foreign accent but the effect is not very significant. Specifically, after a so-called rapid initial phase of learning one experiences in the period after the very arrival in the host country, the LOR effect exponentially diminishes, i.e. the higher the learner's experience is, the less the LOR further reduces the degree of an accent (p. 199).

Finally, as has been mentioned, the most influential factor seems to be the age of learning (AOL), sometimes referred to as age of arrival in the country where L2 is predominantly spoken. Flege et al. (1999) for example had native American listeners judge the accent of Korean speakers who varied in their AOL. It was found that the AOL correlated with the degree of foreign accent quite reliably. Furthermore, Ioup (1984) confirmed the importance of the AOL factor when she showed that late learners can be identified solely on the grounds of their accent.

Thus, the AOL seems to be a significant factor for the degree of foreign accent such that the younger the learner is, the higher the chance of acquiring native-like pronunciation. This does not, however, mean that speech will necessarily be accent-free when learned before puberty. Not even bilingual speakers seem to be able to avoid a foreign accent in their speech fully as their L1 and L2 categories constantly interact (Zampini, 2008, p. 223). Furthermore, even a late learner is able to attain native-like pronunciation as evidenced by Bongaerts et al. (1997). Thus, the AOL cannot be considered the only important factor which can account for all the instances of foreign-accentedness. Other variables come to play their role and the final degree of a foreign accent is a result of their interaction and interplay.

2.1.3. Chapter summary

A foreign accent in speech is an ever-present feature of almost anyone speaking a language which is not their native one. An accent is suggested to originate for example due to inaccurate perception of L2 sounds, inadequate phonetic input or insufficient motivation (Flege, 1995). However, the most significant reason seems to be reduced neural plasticity which is a consequence of neural maturation. It was proposed that, due to neurobiological reasons, when a person reaches a certain age towards the end of a so-called critical period, it is impossible to acquire native-like pronunciation of an L2 (Piske et al., 2001, p. 195). A critical period is, however, a disputable postulate, and some evidence that stands against it can be found in literature. What it considered to be the mechanism behind accent origination is the language transfer, i.e. the influence of the established phonemic categories of one's L1 on the perception and production of an L2. It is believed that the more firmly established the L1 is in the learners mind, the more the L2 categories will be influenced by it. In other words, the older the learner, the stronger influence there is. Thus, age of learning certainly plays a significant role in the degree of the pronunciation acquisition quality. Other factors that can affect the degree of a foreign accent in speech are for example the learner's length of residence in the country where the L2 is predominantly spoken, and the amount of L1 and L2 use.

Although accented speech may have a number of adverse impacts, there are also advantages of speaking with an accent, especially when one communicates with a person with whom they share the native language background (NLB). This benefit will be introduced in the following chapter.

2.2. Interlanguage speech intelligibility benefit

This chapter aims to provide a review of literature concerning the interlanguage speech intelligibility benefit (ISIB). The ISIB hypothesis will be introduced and described in detail. The principal work which has coined the name of this phenomenon (Bent and Bradlow, 2003) will be presented along with prior research leading up to it. The follow-up research will subsequently be introduced and discussed. Both findings in favour of and against the ISIB will be presented. At this point, however, it is necessary to have a closer look at the notion of speech intelligibility as such and dimensions and factors related to it.

2.2.1. Accentedness, comprehensibility, intelligibility

Three aspects playing a role when assessing foreign speech were defined by Munro and Derwing (2006): accentedness, comprehensibility, and intelligibility. Accentedness was defined as a degree to which an utterance diverges from an expected production pattern. An important distinction was, however, made between two notions which often tend to be confounded; these are intelligibility and comprehensibility. The former represents what the listener actually understands, i.e. what portion of the message has been successfully conveyed, and the latter refers to estimated difficulty of understanding the utterance, i.e. the effort that has to be made when trying to understand the utterance (p. 112).

Accentedness and comprehensibility are most often evaluated by perceptual judgements of phonetically untrained listeners which are recorded on equal-interval scales. Munro (2008) argues for this sort of measurement as opposed to expert judgements and acoustic analyses of the speech as follows:

> In the first place, as already observed, phonetically trained evaluators do not necessarily respond to L2 speech in the same way as unsophisticated listeners. In the second, instrumental measurements might, in principle, reveal differences between native and non-native speech that are not noticed by listeners and that therefore do not result in an accent (p. 200).

It is therefore necessary to use untrained listeners' judgements as it is the phonetically untrained listeners who may experience intelligibility problems associated with foreign-accented speech in real-life situations.

For measuring the word-level or whole-sentence-level intelligibility, a number of methods is used and may also be combined. One of the most common ones is a dictation task in which a listener is supposed to transcribe the utterance in standard orthography and the words correctly transcribed yield an index of intelligibility. Other methods include summary elicitation, cloze tests, comprehension questions, or multiple choice answers.[1] Some of the research even used a method in which intelligibility was rated in a scalar fashion (Fayer and Krasinksi, 1987), which proved to be the least appropriate method (for details see Munro, 2008, p. 200-201).

Intelligibility of an utterance has been considered as the most essential aspect of (non-) native speech as compared to accentedness and comprehensibility (Johansson 1978; Subtelny, 1977). This seems to be logical as, in simple terms, what is important for a spoken message is that it is conveyed to the listener as it was intended by the speaker. This, however, does not have to be entirely true as a foreign accent may have a very negative discriminative impact on how the speaker is perceived (see section 2.3.).

2.2.1.1. Factors affecting the intelligibility

Intelligibility may be influenced by a number of talker-dependent (also called stimulus properties [the SP component]) as well as -independent (listener factors [the LF component]) factors. As for the SP component, intelligibility may be impaired by a strong foreign accent in some instances. When the accented speech diverges from the phonological norms of the target language to a considerable extent, the listener may not able to decode it as it was intended by the speaker. These departures from the target language norms may include segmental divergences, i.e. inaccurate

[1] Munro (2008, p. 201) offers a wider review of the methodological alternatives.

production of vowels or consonants (Schairer, 1992; Gimson, 1970), or prosodic errors (Johansson, 1978). Other acoustic cues can also lead to perceived foreign-accentedness and thus cause detriment to intelligibility, e.g. norm departures in VOT (McCullough, 2013). Other aspects may include for example speech rate (Firth, 1992; Bradlow and Pisoni, 1999), loudness and clarity (Firth, 1992), or voice quality (Munro et al. 2003).

As far as the SP factors are concerned, there have been attempts to set up error gravity and accent gravity hierarchies (see Munro and Derwing, 1995a). Particularly, a lot of discussion has been led on the relative contribution of segmental and prosodic errors on accentedness and intelligibility. While some authors found the segmental errors to have a more detrimental effect on intelligibility (Koster and Koet, 1993), it is prosody that has been proven by an overwhelming amount of research to have the graver effect (Munro and Derwing, 1995a; Derwing and Munro, 1997; Derwing et al., 1997; Tajima et al., 1997). However, as for example McCullough (2003) showed, which factors of accented speech are more potent depends on the target language and also on methodology of the research. Therefore, no definite conclusions can be made.[2] Moreover, it is important to note that when listening to accented speech, NNLs and NLs each seem to notice different aspects of the accented speech. NNLs appear to notice above all phonological features (as opposed to lexico-grammatical ones), while NLs tend to be influenced in perceiving the utterance on more levels, i.e. their understanding of the speech is affected by all kinds of linguistic errors, not just phonological ones (Saito, 2011).

Not only by phonetic-phonological and acoustic features can speech intelligibility be affected. What can also play a role is e.g. the use of lexis, or grammatical mistakes

[2] Interestingly, McCullough (2013) also proved that due to different acoustic properties, some languages can sound more accented than others. One of the main reasons for this is the extent of typological similarity of the speaker's and listener's native languages. Bongaerts et al. (2000), for instance, had NNSs of Dutch from a variety of native language backgrounds (NLB), but only pronunciation of those whose native language was typologically related to Dutch (English and German in this case) was assessed as native-like by native Dutch listeners. The others, typologically more distant, were rated as more accented.

(Saito, 2011). There are external factors as well having a significant impact on speech intelligibility, e.g. noise (Munro, 1998; McAllister, 1990; van Wijngaarden, 2001). What has been shown is that noise detriment to intelligibility is negatively correlated with proficiency level of the accented speech, i.e. the more proficient the NN speaker, the smaller detriment there is. Moreover, Rogers et al. (2004) proved that even high-proficiency (HP) speech suffers significantly greater detriment to intelligibility for native American listeners than native speech when noise is added, although there is only a modest difference in intelligibility between the HP speech and native speech in quiet. This suggested that even HP speech is less robust than native speech. Naturally, the relative noise detriment to intelligibility also depends on the target language proficiency of the listener, which brings us to the LF component. NLs are able to find speech intelligible even under adverse conditions while NNLs experience an intelligibility detriment (e.g. Wijngaarden, 2001). Hongyan and Heuven (2007) explain this reduced intelligibility for NNLs as follows: "Native listeners have a vast knowledge of the sound system and statistical structure of the lexicon, which allows them to optimally exploit the redundancy patterns in the language so as to compensate for any deficiencies in the speech input" (p. 1729). To give another example of the LF component factors, listener's NLB (Bent and Bradlow, 2003; van Wijngaarden, 2001; Imai et al., 2003) or familiarity with the topic (Gass and Varonis, 1984) proved to be significant variables. Although it has been shown that accentedness and comprehensibility ratings are influenced to a sizeable extent by SP factors, the LF factors cannot be neglected either. However, the relative contribution of SP and LF components to speech intelligibility still waits to be determined (for a more detailed account see Munro, 2008, p. 205-207).

2.2.1.2. The relationships between accentedness, comprehensibility, and intelligibility

The relationships of these three dimensions of speech are of a complex character and are not always certain to show clear correlations. Generally, accent and comprehensibility tend to be negatively correlated, i.e. the stronger L1-accented the utterance, the lower processing fluency for the NL of the L2 (Munro and Derwing,

1995b; Cheung, 2013; Weill, 2003). One of the most severe impacts of a foreign accent causing lower processing fluency (worse comprehensibility) is a possible detriment in intelligibility of the utterance. However, as far as the pair of accentedness and intelligibility is concerned, the two do not have to be negatively correlated in all cases, so even an utterance which is assessed by a listener as heavily accented may still be perfectly understood. Thus, at this point, it is clear that the interrelationships between the three dimensions are not straightforward and should be considered separately to a certain extent (for more details see Munro and Derwing, 1995a,b; or Munro, 2008).

The case of non-correlation of accentedness and intelligibility is especially valid when NN participants are involved. NNLs were proven to perceive foreign accented speech in a different way than NLs do, such that in some cases they seem to have a benefit in understanding, i.e. intelligibility, as there is probably less processing difficulty (better comprehensibility) for them. That is to say that NNLs can be shown to perceive a foreign accent to a considerable degree even when they share the NLB with the speaker, but still have an advantage in actual understanding of the accented speech. Munro and Derwing (1995a), for example, demonstrated that familiarity with the speaker or speech may lead to harsher accent ratings by the listeners, which necessarily does not have to entail reduced intelligibility. Similarly, Šimáčková and Podlipský (2012) showed that Czech listeners perceived Czech accent in English as stronger than listeners from other NLBs but still had an advantage in intelligibility over the other listeners. This provides evidence that accent and intelligibility may be positively correlated, particularly in the case of NN speaker-listener pairs, implying lesser reduction in comprehensibility compared to NLs' perception. In fact, there seems to be a benefit in intelligibility for NNLs over NLs due to this improved processing fluency. Thus it can be said that, in the case of NNLs, foreign accentedness may be positively correlated with comprehensibility which subsequently leads to higher intelligibility. This assumption provides a ground for the phenomenon called the interlanguage speech intelligibility benefit.

2.2.2. Definition of the benefit

Bent and Bradlow (2003) who coined the name for the benefit defined the phenomenon as an advantage in intelligibility NNLs enjoy when listening to NN English speech such that the accented speech is at least equally intelligible for them as native English speech. The benefit is reported to take place either when the NNL shares the NLB with the non-native speaker (NNS) – matched interlanguage speech intelligibility benefit (hereinafter referred to as MISIB where specification is needed) or when the NNL comes from a different NLB than the NNS – mismatched interlanguage speech intelligibility benefit (MMISIB).

It is useful at this point to mention one later research which further subcategorized the ISIB into two subtypes. It was Hayes-Harb et al. (2008) who defined the ISIB for listeners (ISIB-L) and ISIB for talkers (ISIB-T). The former refers to a situation in which NNLs have an advantage in intelligibility of foreign-accented English over native English listeners, e.g. Czech listeners understanding Czech-accented English better than English listeners do, i.e. comparing two categories of *listeners* given the same speaker, hence ISIB-*L*. The latter refers to such a case when NNSs are at least as intelligible to NNLs as NSs are, e.g. Czech listeners understanding Czech speakers of English at least as well as native English speakers, i.e. comparing two categories of *speakers* given the same listener, hence ISIB-*T*. This division is adopted throughout this thesis and applied also to those studies which did not use this division themselves as it had not been introduced at that point. Furthermore, another important specification was provided by Stibbard and Lee (2006). Speaking of the ISIB-T, they argue that it is not enough for NNSs to be *at least as intelligible* as NSs to NNLs. In practical terms, a benefit as such would mean for NNLs to reach even better intelligibility scores listening to NNSs than they would be able to reach when listening to NSs. No one would in fact truly benefit from a situation in which NNLs would understand a NN speech to only the same extent as they would understand native speech. As far as the ISIB-L is concerned, the same principle would apply, i.e. for the ISIB-L, NNLs should be *better* at understanding NN speech than NLs would be. This specification will also be embraced further in this work and, where

relevant, the results of those studies which did not apply such a conception of the ISIB will be reanalysed in this fashion and given and compared with the original results.

2.2.3. Research preceding Bent and Bradlow (2003)

This chapter will present the research leading to the establishment of the ISIB hypothesis by Bent and Bradlow (2003).

It is needless to say that NLs understand speech produced by other natives better than they would understand any NNS. It has, however, been long reported in literature that NNSs may be generally more intelligible to other non-natives than NSs are (e.g. Nash, 1969), which is a phenomenon very often reported also orally by a number of NNSs who come in English communicative contact with other non-natives. As English has been becoming a world-wide language used very often as lingua franca or an international language, the issue of mutual intelligibility of variously accented Englishes has come to be very topical. As soon as in 1979, research was conducted in intelligibility of English in cross-cultural communication (Smith and Rafiqzad, 1979). This is an extensive study involving a huge amount of participants from 11 countries, specifically 1,386 speakers of educated English,[3] trying to map the world-wide situation of mutual intelligibility or shared response to variously accented English. The authors hypothesised that the listeners would find the NNSs from the same NLB at least equally intelligible as the NSs of English, i.e. ISIB-T in the terms of Hayes-Harb et al. (2008). NNSs from geographically close areas, somewhat implying a typologically close language, were suggested to have a certain intelligibility benefit too, i.e. MISIB-T and MMISIB-T were hypothesised. No American listeners, however, were included in the study so ISIB-L could not be examined. The listeners completed a cloze intelligibility test and high degree of

[3] The term 'educated' English is an attempt to control at least a little for the aforementioned factor of proficiency of the participants. It refers to the language of participants who have completed formal, ideally tertiary education, and it is supposed that such educated English has almost always the same grammar wherever it is found, differing only in phonetic-phonological features.

consistency in intelligibility was found for listeners who either shared or did not share the NLB with the speakers. In other words, there was a shared response to variously accented English by the NNLs. Moreover, a number of listeners were quite reliably able to identify their fellow countrymen for they were able to recognize the accent. However, an actual MISIB-T was found in a small number of cases as the listeners did not show full consistency in intelligibility of a speaker sharing the NLB with them. The NNSs not matching in their NLB were, however, generally more intelligible to NNLs than NSs were, which provided evidence for a MMISIB-T. Nevertheless, it is important to mention a major limitation of this research which is the fact that extemporaneous, rather than grammatically and lexically controlled, speech was used as the stimuli. As the wording of the speech samples was the speakers' choice, the difficulty of the native and NN passages differed considerably. In other words, the American speakers spoke in a more difficult way (more complex syntax, lexis, etc.) than any of the NNSs (albeit 'educated') did, and NNLs simply had more difficulty understanding the more complicated samples, which must have confounded the results. This, however, does not depreciate the significance of the research as for example smaller complexity of syntax is often characteristic of NN speech and is likely to lead to a benefit in understanding in real-life situations. This research showed that there is a shared response by NNLs to accented English, no matter if the listeners share the NLB with the speakers or not.

Van Wijngaarden (2001) also came to a conclusion that for NNLs NN speech may be more intelligible than native speech. This is one of a few prominent studies which investigates intelligibility in L2 which is not English. The participants for this research comprised eight American speakers of Dutch (their L2) who had spent several years living in the Netherlands and native Dutch listeners rating their intelligibility. NSs of Dutch were also used to serve as a baseline group together with the Dutch NLs. This research focuses primarily on quantifying the degradation effect of accentedness under adverse listening conditions, using the Speech Reception Threshold (SRT) method. In simple terms, this method measures how much noise can be added to the signal so that the speech is still 50% intelligible. As expected,

NLs performed better listening to NSs than listening to NNSs, i.e. the amount of noise was very high while the speech was still intelligible. When the NLs were listening to NNSs the signal-to-noise ratio had to be higher for the speech (i.e. more signal, less noise) to be 50% intelligible as NLs experienced some difficulties comprehending the NN speech. A comparable amount of noise was required for the NNLs listening to NSs, while NNLs showed the least intelligibility when they tried to understand NNSs. This does not appear to be in line at all with the ISIB hypothesis. What is important, however, is that the NNSs showed the least intelligibility *as a group*. Taken individually, significant differences emerged. The reason for such bad group results showed to be two speakers who had been identified as most accented and they probably were the least experienced with Dutch (talkers L2M5 and L2F6). The intelligibility these two showed skewed the overall group results. In fact, there were two American speakers (L2M7 and L2F8) who were actually as intelligible to NN American listeners as none of the four Dutch native speakers, as can be seen in Figure 1.

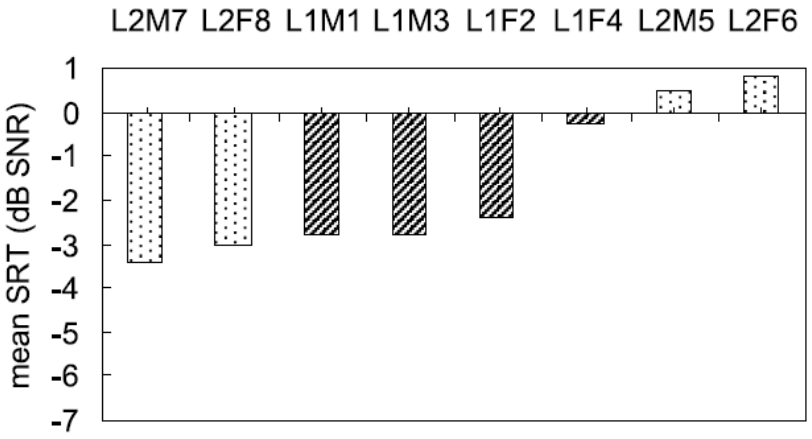

Figure 1. Mean SRT scores for eight individual speakers within the L2 group of listeners (four listeners per condition) (van Wijngaarden, 2001).

All the NSs were less intelligible to the NNLs than the NNSs, putting aside the two least experienced American speakers of Dutch (L2M5, L2F6). This provides

evidence for the ISIB-T as American listeners understood American-accented Dutch better than native Dutch speech in this instance. Furthermore, the methodology of this research indicates that noise is a significant contributor to reduced intelligibility. It was also proven that NN speech is less robust than native speech for it has been shown that native speakers did not mind the highest level of noise when listening to natives but needed less noise to understand NN speech (see Rogers et al., 2004, for research on robustness of L2 speech). This paper also aimed to examine whether intonation plays an important role for intelligibility or whether segmental features are of higher significance. Contrary to contemporary belief and majority of research in intelligibility of NN production of *English*, it was found that less authentic intonation did not have a detrimental effect on the intelligibility of NN production of *Dutch*. Overall, importantly for this thesis, van Wijngaarden (2001) proves that there is a certain ISIB-T for American speakers of Dutch.

Van Wijngaarden (2002) also provided evidence in favour of the ISIB-T and, in addition to that, immersed in the factor of listener proficiency. Trilingual listeners were engaged who spoke Dutch as their L1, English as their higher proficiency language, and German as their lower proficiency language. The talkers were either native (English and German) or non-native, proficient in their L2s. The proficiency was not measured in any way but was self-reported. When listening to English (their higher proficiency language), the NNSs were not more intelligible to the listeners than the NSs, indicating that the ISIB-T does not apply for proficient L2 listeners. However, when the trilingual listeners were presented with NN German speech, which was their lower proficiency language, the intelligibility of the NNSs was higher to the listeners than the intelligibility of native speech, indicating ISIB-T for LP L2 listeners when perceiving proficient L2 speech. This clearly demonstrated the effect of listener and talker proficiency on L2 intelligibility and provided strong evidence for the ISIB-T.

Imai et al. (2003) investigated the intelligibility effect of a shared L1 of speakers and listeners on the word level. Native Spanish and native English listeners were engaged, listening to stimuli which comprised native English and Spanish-accented

items. It was hypothesised that native Spanish listeners would enjoy an intelligibility benefit (recognize more words) over native English listeners when listening to speech accented by their L1, i.e. Spanish. The results showed that there is indeed a benefit for Spanish listeners perceiving Spanish-accented English words over native English listeners, providing quite strong evidence for ISIB-L on word recognition level.

Major et al. (2002) also explored the effect of shared L1 on intelligibility. Asserting that foreign-accented English is a normal component of English as a second language listening exercises, he took 100 listeners whose L1s were American English, Japanese, Chinese, and Spanish, and had them listen to variously accented English lectures. The listeners were subsequently asked to provide answers to certain questions concerning the lecture. It was found that NN speech was generally less intelligible for both native and NN listeners, which is not in line with any form of the ISIB. The Spanish listeners, however, scored significantly higher when listening to Spanish-accented English, providing some evidence for the ISIB-T. On the other hand, also some findings appeared which spoke against the ISIB theory (for details of the results and other evidence against the ISIB see section 2.2.5.).

In summary, the research presented so far provides some convincing evidence for the ISIB-T (L) with various factors other than shared NLB coming into play, e.g. listener and speaker L2 proficiency, or grammatical complexity of the speech. Most of this body of research served as a basis for coinage and establishment of the ISIB theory by Bent and Bradlow (2003).

2.2.4. Bent and Bradlow: "The interlanguage speech intelligibility benefit"

In 2003, a study crucial for the question of and further investigation in mutual intelligibility of accented L2 speech was published by Tessa Brent and Ann Rosalie Bradlow. This research served as a stimulus for a great deal of further research in a possible effect of shared listener-talker NLB on L2 intelligibility. The two main

issues which this research aims to explore are the possible effect of either a match or mismatch in NLB of the listener and the speaker on their mutual intelligibility, and the effect of speaker L2 proficiency on a possible intelligibility benefit.

The study engaged five speakers of English, four of which were NN. Specifically, native Chinese (2), Korean (2), and English (1) talkers were included whose speech samples were picked from The Northwestern University Foreign Accented English Speech Database. The samples were syntactically simple sentences containing words which were highly familiar to NNs, such as "The fruit is on the ground," or "The mailman brought a letter," each of the utterances containing three or four keywords. This ruled out the possible factor of immoderate grammatical complexity. Moreover, the word familiarity was even re-tested later in the experiment. An important feature of the recorded speech samples was the fact that they were additionally embedded with noise, prospectively impairing the intelligibility for most of the listeners except for the native-native condition, i.e. NLs listening to NSs, which is a condition in which noise does not play a significant role (see van Wijngaarden, 2001). All of the participating NN talkers demonstrated a high level of proficiency in written English communication but had limited experience with spoken English. The talkers were evaluated in terms of intelligibility by native English listeners in an intelligibility keyword transcription task. Four out of tens of talkers were chosen for the experiment according to two main criteria, i.e. their NLB (either Chinese or Korean), and the intelligibility scores they obtained by native English listeners. Based on the latter criterion, one HP and one LP talker from each NLB group were chosen as talker proficiency was one of the main subjects of investigation. Both the HP talkers obtained roughly 80-90% intelligibility scores from the NLs, i.e. 80-90% keywords transcribed correctly, while the LP talkers received scores around 50%. The native English speaker's speech samples were recorded in the same way as the NNSs', and this speaker was not subjected to any intelligibility testing.

The listener group for this experiment comprised 21 native English listeners (NLs), 21 NN Chinese listeners, 10 NN Korean, and a mixed listener group of a great diversity of NLBs containing 12 NN listeners (Bulgarian, Dutch, French/Douala,

German, Greek, Hindi, Japanese, Serbian, Spanish, and Tamil). Listener proficiency was not specifically controlled for so this experiment focuses principally on the effect of speaker proficiency (compared to e.g. van Wijngaarden, 2002).

The participants listened to the speech samples, having been instructed to transcribe exactly what they have heard on a special sheet of paper. The transcriptions were subsequently evaluated in terms of correctly transcribed key words. After the perception test, word familiarity for NNLs was re-tested. The vast majority of the words was highly familiar to most of the listeners so this could not play a significant role as an impediment to sentence intelligibility.

It was hypothesized that the NNSs of relatively high proficiency in English (L2) will be at least equally intelligible as the NS of English for those NNLs who share the NLB with the NNS. This would possibly lead to a MISIB-T as the speakers and listeners in such a case share the linguistic and phonetic-phonological knowledge of their L1, which might facilitate the communication. The effect of shared NLB for the intelligibility of the less proficient NNS was predicted to be lesser or possibly none as their production might be so far from the L2 norm that the actual message should not be conveyed, for lexical contrasts themselves might get lost in the speech. This would result in very low intelligibility for NLs as well as NNLs sharing the L1 with the speaker. The second hypothesis was that the relatively high proficiency NNS will also be at least as intelligible as the NS to NNLs for whom there is a mismatch in the NLB. This was predicted to possibly lead to a MMISIB-T thanks to the fact that certain common properties of NN speech may generally serve as cues for facilitating the perception for NNLs regardless of their NLBs. The same properties, however, may at the same time render the speech perceptually non-native and more difficult to understand for NLs.

As in previous studies, the results showed that NSs were more intelligible for NLs than any other speaker. The LP talkers were generally less intelligible than the HP or native talkers for all listeners. The first hypothesis was proven as the NNLs sharing the NLB with the HP NNS found this NNS as intelligible as the NS of English. This applied for both Chinese and Korean HP talkers towards their NLB counterparts. In

one case, however, one LP talker was found as intelligible as the NS to the NNLs sharing the NBL with the LP talker. The intelligibility results for all the speaker and listener groups are shown in Table 1:

Listener group	Talker					All talkers
	Chinese high proficiency	Korean high proficiency	Native English	Chinese low proficiency	Korean low proficiency	
NN-Chinese (n=21)	**64** (**10.8**)	**66** (**11.7**)	**56** (**10.4**)	30 (12.1)	41 (9.8)	51 (17.4)
NN-Korean (n=10)	**60** (**15.5**)	**74** (**15.8**)	**60** (**11.7**)	22 (11.4)	**53** (**12.0**)	54 (21.7)
NN-Mixed (n=12)	**62** (**11.0**)	**70** (**7.7**)	**67** (**15.8**)	19 (20.9)	41 (14.8)	52 (24.1)
Native English (n=21)	77 (12.2)	91 (8.4)	**109** (**14.7**)	38 (13.8)	60 (12.1)	75 (27.7)
All listeners	67 (13.9)	76 (15.2)	76 (26.8)	29 (15.9)	49 (14.5)	

Table 1. Percent keywords correctly transcribed for talkers and listener groups in rau. Standard deviations are shown in parentheses. Scores in bold are significantly higher than the other scores in the row and are not significantly different from one another except for the underlined scores (Bent and Bradlow, 2003).

Namely, the HP Chinese talker was more intelligible than the native English talker to the Chinese listeners, the HP Korean speaker was more intelligible than the native speaker to the Korean listeners, and the LP Korean speaker was as intelligible as the native English talker to the Korean listeners. This provided clear evidence for MISIB-T for Chinese and Korean NNLs when listening to speakers from their own NLB. In addition to that, a benefit was also demonstrated for those NNLs who listened to the HP NNSs with whom they did not share the NLB. Despite the mismatch, the Chinese listeners understood the Korean speaker better than they understood the NS, and the Korean listeners showed an intelligibility benefit when perceiving HP Chinese speech. The Chinese listeners demonstrated no benefit when listening to the LP Korean speaker with whom the Korean listeners experienced an intelligibility benefit. The mixed group of listeners coming from various NLBs

also found the HP NNSs at least equally intelligible as the native English speaker. This gave rise to a MMISIB-T.

Although it was not an aim of the research, the results also indicate that there was no ISIB-L for any of the NNLs as the native English listeners showed better intelligibility scores in absolute terms for all of the NN speakers (LP as well as HP) than any NNLs did.

When the results are, however, considered in the terms of Stibbard and Lee (2006), i.e. only those situations in which the NNSs actually *outperform* the NSs in being understood by the NNLs are considered an ISIB, the matter takes on a different complexion. Bent and Bradlow's results reanalyzed in such a fashion, there seems to be no MMISIB-T for the Koreans and the mixed group listening to the HP Chinese speaker. Moreover, the NN Korean listeners lose their MISIB-T towards the LP Korean talker. For the other MISIB-T conditions and the Chinese-Korean and mixed-Korean MMISIB-T conditions, the benefit remains to be valid even in these 'stricter' circumstances.

Regarding the results, it was suggested that the MISIB emerged due to the linguistic knowledge shared between the listeners and talkers from the same NLB. In other words, such NNSs and NNLs have a common linguistic knowledge of both their L1 and the target language (L2, English in this instance). For NSs of English, the shared knowledge base with the NNLs is only the target language (English) to the extent of language knowledge achieved by the NNL. This makes the processing of NN speech for the NL more difficult, leading to reduced intelligibility. Thus, the NNL may find certain cues for interpreting the speech (e.g. specific production of vowels, consonants, stress patterns, rhythm, intonation, etc.) which may be absent for the NL for whom such cues serve just as contributors to foreign accentedness, and who is, on the other hand, properly equipped to understand native speech better than NNLs. To give a simple example concerning Czech-accented English, Czech speakers of English tend to substitute the voiceless dental fricative /θ/ by the alveoral fricative /s/. This may be a confusing substitution for a NL, contributing to perceived foreign accentedness for the English listener, possibly causing detriment to intelligibility. On

the other hand, it may prove a beneficial substitution for a Czech listener who would produce (substitute) the fricative in the same manner or knows from experience that this happens in Czech-accented English. This may therefore serve as a intelligibility facilitator for such a listener.

The basic presupposition for the elucidation of the MMISIB is again the fact that NNSs and NNLs share the linguistic knowledge of the L2. They do not, however, share such knowledge for their L1s which are not identical. It is therefore suggested that all NNLs employ similar strategies when producing and perceiving L2 speech, which leads to the benefit. Bent and Bradlow give an example concerning unreleased word-final stops in American English. Because native American English speakers perceive certain cues for the presence of a final-word stop in other parts of the speech signal than in the final stop itself, they are able to compensate for the unreleased consonant. However, NNLs generally may not be able to perceive these cues if they have not mastered the American English phonology yet. On the other hand, English speech of such NNSs is likely to contain saliently unreleased final-word stops which may, again, make the speech more foreign accented to the ears of a NL but more intelligible for NNLs from a wide range of NLBs who are able to correctly recognize the word containing the unreleased stop just because they apply the same perception strategy, i.e. they focus on the stop itself. This then gives rise to the MMISIB. Another explanation for the mismatched benefit according to Bent and Bradlow is possible sound structure similarities of the NNLs' L1s in question, which would be in fact just another manifestation of the MISIB. This hypothesis is, however, highly unlikely as the mixed group of NNLs found the Chinese and Korean HP speakers as intelligible as the NS of English, while they came from a *wide* range of NLBs, the sound structure of some of which was far from similar to, say, Chinese (compare for example Chinese and Spanish).

In summary, Bent and Bradlow (2003) provided strong evidence in favour of the MISIB-T for Chinese and Korean NNLs listening to HP NNSs who share their NLBs. Further, it provided some evidence for MMISIB-T for Chinese and NNLs from a variety of NLBs listening to the HP Korean speaker. This study, along with

any research investigating speech intelligibility, clearly shows that any measure of speech intelligibility must necessarily take into account not only the characteristics of the talker but always the talker-listener interaction. However, as this experiment comprised only Korean and Chinese speaker-listener pairs when investigating the MISIB, no general conclusions can be drawn about possible MISIB for other languages. Furthermore, this paper does not take into account another possible source of the ISIB which is experience with a particular foreign accent, which might also facilitate intelligibility (Baese-Berk et al., 2013; Cristia et al., 2012), and takes into consideration only similarities in the phonetic-phonological systems. As Bent and Bradlow state, since lexical content and syntactic structure of the speech samples were controlled for in this experiment, the benefit seems to be originating at a relatively early, phonetic stage of signal processing. This can, however, only be assumed because the intelligibility is measured here on the whole-sentence level and not on lower levels. Moreover, this research involved only a small number of talkers, albeit carefully chosen from The Northwestern University Foreign Accented English Speech Database. A higher number of speakers would provide more reliable results. Furthermore, their proficiency might have been controlled for in even a more careful manner. The LP and HP speakers were distinguished only on the grounds of native English listeners' judgment of their intelligibility. Accentedness could have been rated as well and thus phonological proficiency could have been obtained and combined with the intelligibility ratings. This would have provided a more complex and reliable picture of speaker proficiency.

Therefore, although Bent and Bradlow (2003) provides strong evidence for the matched and some evidence for the mismatched interlanguage benefit, it also offers a good deal of challenges and unexplored aspects of the ISIB for future research which is indeed quite extensive.

2.2.5. Follow-up research in favour of the ISIB

Most prominent research which looks deeper into the numerous aspects which have affect the ISIB will be presented in this chapter, followed by some research which

failed to prove the ISIB theory or which stands directly against it. The main focus of this chapter will be on the factor of listener/speaker proficiency which is considered one of the most influential variables, but a few other factors will be discussed as well.

2.2.5.1. The factor of listener/speaker proficiency

Hayes-Harb et al. (2008) tried to examine the ISIB on the word level with regard for listener and speaker proficiency. More precisely, this research concentrated on word-final stop voicing contrasts in words such as 'pick' and 'pig'. Moreover, it tried to dig even deeper in order to discover which temporal-acoustic properties of these productions specifically are responsible for a possible benefit. Twelve talkers for the experiment were chosen from Northwestern University's database of NN speech. The listener groups consisted of fifteen native English listeners and fifteen NN Mandarin listeners. Based on the results of previous research that the ISIB is affected by listener (e.g. van Wijngaarden, 2002) and talker (Bent and Bradlow, 2003) proficiency, this study divided *both* the listeners and talkers into LP and HP groups according to their phonological proficiency, i.e. their accentedness ratings provided by NLs of English. The ones with the weakest accent were designated as HP and those who had strong accent as LP participants. The stimuli were presented as isolated tokens and the listeners were supposed to identify the word they had heard. The NLs were, as expected, most accurate at identifying the non-accented words spoken by NSs of English. What was of particular interest here was the fact that the NNLs did not show better intelligibility towards NNSs than to NSs. To the contrary, they understood the words produced by the NSs better, which stands against the ISIB-T theory. However, the NNLs proved to be more accurate at identifying the consonant voicing in words produced by NNSs than the NLs were, demonstrating an ISIB-L. In this stage of measuring, group averages were used, i.e. the HP and LP talkers were considered together and the same applied for the listeners.

In the consequent measuring, the LP and HP participants were divided in order to investigate the factor of listener and talker proficiency on the ISIB. The results are shown in Figure 2:

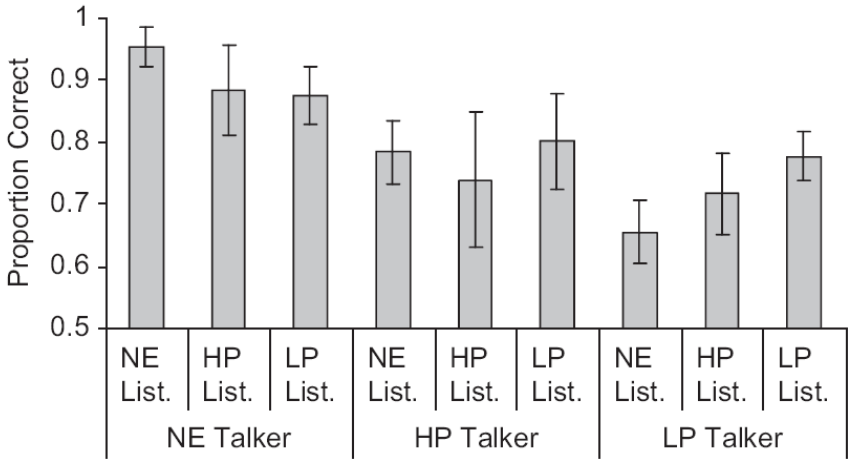

Figure 2. Word identification accuracy, organized by listener group and talker group (chance performance is .50; bars represent +-1 standard deviation) (Hayes-Harb et al., 2008).

As can be seen, it was found that there was no ISIB-T for either the LP or the HP group of speakers, i.e. there was no intelligibility benefit for the NNLs in comprehending the NNSs compared to the NSs, regardless of the proficiency of the listeners or talkers. As was reported above, the NNLs indicated an ISIB-L. The proficiency groups considered individually, the ISIB-L was discovered only for LP listeners listening to LP speakers. These results are in line with those of van Wijngaarden (2002) who also found the ISIB for LP listeners. Bent and Bradlow (2003), however, proved the benefit only for HP speakers. In the light of this, two remarks must be made here. Firstly, Bent and Bradlow (2003) and Hayes-Harb (2008) each measured the proficiency in a different way (phonological proficiency and intelligibility proficiency, respectively) and this might have had an impact on the results. Secondly, the results of van Wijngaarden (2002) and Hayes-Harb (2008) do not have to be consistent either as the former focused on the ISIB-T and the latter proved the ISIB-L and did not find the ISIB-T. These two are partly independent

phenomena as evidenced by Xie et al. (2013). What can, however, be seen in all of the works mentioned is the unfaltering fact that whichever method is used, and no matter which ISIB subtype is examined, proficiency of the NN listeners and speakers plays a significant role in L2 intelligibility.

When acoustic measures of the stimuli for which the ISIB-L was found were analyzed, acoustic cues used by the NNLs to identify the NN word more accurately than the NLs were discovered. What was measured here was the durations of the vowel, second consonant closure, second consonant voicing, and the duration of the second consonant burst. The results indicated that for the voiceless consonant tokens the closure and voicing durations of the second consonant are the important aspects. The NSs voiced the consonants significantly shorter than the NNSs. For the voiced consonant tokens, the second consonant voicing duration was the only significant factor such that the NSs voiced the final consonants much longer than the NNSs did. Thus, it seems that the length of voicing of the second consonant is the principal acoustic cue for the NNLs to identify the words more efficiently than the NLs for whom this unnatural voicing in fact poses an obstacle in understanding.

Another work which touched on the issue of talker and listener proficiency with regard to its effect on the ISIB is Xie et al. (2013). They investigated a possible ISIB-T as well as -L in Mandarin and native American listeners. What was unique in this study was that the effect of language environment was taken into account. Specifically, not only Mandarin listeners living in their native country were used (the non-immersion listeners), but also native Mandarin listeners who had lived in the United States for some time (the immersion listeners) participated. Intelligibility was measured on the basis of correctly identified non-words differing in word-final stop voicing. Native American listeners performed badly identifying Mandarin-accented speech, as expected. The non-immersion listeners identified the words better if they were produced by a Mandarin speaker, giving rise to the ISIB-T. Interestingly, it was found that the immersion listeners were intermediate between the native and non-immersion listeners. They identified the Mandarin-accented words as efficiently as their non-immersion counterparts but were equally good with native-accented words.

With those, however, they were no match for the NLs. In other words, the immersion Mandarin listeners did not show an ISIB-T as they had attuned to native speech which had become more intelligible to them. On the other hand, they did not lose the sensitivity to their native speech so they showed to enjoy an ISIB-L, i.e. they were better with Mandarin-accented speech than native Americans were. Thus, it was demonstrated that language environment may have an effect on NNLs such that the ISIB-T diminishes due to increased L2 (English) proficiency. This also means that ISIB-T and -L are each separate phenomena and do not always go hand in hand. The NNLs who are exposed just to their L1-accented English speech perceive such speech as more intelligible than native speech, i.e. ISIB-T. Talker and listener proficiency were also proven important by this research. In accordance with van Wijngaarden (2002), it was shown that the lower the proficiency of the listener was, the higher the ISIB-T became. Furthermore, it was shown that this type of the ISIB holds only for talkers of relatively high proficiency in English, which is in line with the findings of Bent and Bradlow (2003).

Pinet et al. (2010) likewise sought to ascertain the effect of NNLs' L2 (English) experience. Furthermore, as one of a few, they focused on the contribution of prosody to recognizing native and NN speech in noise. One group of native English listeners and two groups of French listeners differing in their L2 experience were used. The stimuli were digitally processed so French prosody was imposed on native English sentences. For the NLs, the unchanged English prosody sentences were most intelligible, as expected. The less experienced French listeners enjoyed a benefit listening to the French prosody sentences, and the more experienced French listeners, as the immersion listeners in the abovementioned Xie et al. (2013), showed more flexibility of processing. Their performance depended on the level of noise embedded in the stimuli, i.e. they seemed to rely on different cues, depending on how much noise was added. They were much like NLs when listening in quiet while they started to be more accurate with French prosody sentences when noise was increased. Thus, it was proven that the ISIB holds for LP listeners (in line with van Wijngaarden 2002) even in terms of prosodic features. Furthermore, the ISIB

extended also for HP listeners when noise was added. The listeners' reliance on prosodic cues in L2 accented speech is modulated by their L2 experience.

Song (2011) investigated the ISIB on the prosodic level as well. Native and NN perception of stress patterns was tested in English disyllabic words in which the stress pattern determines whether the word is a noun or verb. The talkers and listeners were either native English or Korean (LP or HP, phonological proficiency) so this research also attempted to discover the role of listener and talker proficiency for the ISIB. The ISIB-L was discovered for the HP Korean listeners listening to the LP Korean talkers. This is partly contrary to Hayes-Harb (2008) who found the ISIB-L only for LP listeners listening to LP talkers.[4] In fact, the HP NNLs in this study were highly accurate at identifying the stress patterns produced by the NSs as well as by the NNSs sharing the NLB with them. The Korean listeners were proven to rely on, i.e. benefit from, certain acoustic cues appearing in their L1, such as fundamental frequency, and not on other cues as NLs would, such as vowel reduction or syllable duration. That is to say, the Korean speakers and listeners share the phonological knowledge of their L1, Korean, and thus they also share phonological representations of English lexical stress. Therefore, the NNLs are able to identify NN stress patterns in English with higher accuracy than the NLs, which corresponds with the explanation for the emergence of the ISIB which was suggested by Bent and Bradlow (2003). As the HP NNLs identified to a high extent the NN words as well as the native English tokens, Song suggested that thanks to their high proficiency they have acquired the English lexical patterns almost to a native-like extent and are able to identify the stress correctly in native English speech, which, for example, the LP listeners would not be. At the same time, these HP listeners are able to utilize their representation of Korean-accented stress patterns they have in common with the LP Korean speakers. This research offers evidence for the ISIB-L when LP talkers are involved, which is in line with Hayes-Harb (2008). Further, it showed that the ISIB originates also on the prosodic level. The results also shed some light on the cues

[4] A comparison with Bent and Bradlow (2003) cannot be made here as they investigated only the ISIB-T. The ISIB-L was not found.

NNLs use in perceiving NN speech (e.g. fundamental frequency), as opposed to natives who make use of different, often more complex cues, e.g. a combination of vowel reduction and syllable duration.

2.2.5.2. Other factors influencing the benefit

Kau Chu and Tau (2010) also tried to prove the shared phonological knowledge as the basis for the benefit. Furthermore, another aspect which could give rise to the ISIB was focused on. The research was concerned with the effect of relative word frequency on a possible benefit. NN Cantonese with a strong accent and native English listeners were listening to Cantonese-accented and native-accented monosyllabic words which were divided into three categories: high-frequency words such as 'thin', low-frequency words like 'buzz' and phonologically non-ambiguous words such as 'low'. The high-frequency word 'thin' is likely to be mispronounced (and thus misinterpreted) as /fɪn/ by the non-natives instead of /θɪn/, while for the NLs the mispronunciation would yield the low-frequency word 'fin'. On the other hand, the low-frequency word 'buzz' would probably be mispronounced by the NNSs as 'bus' as it is more common in everyday communication, and the same misinterpretation would apply for NLs listening to such NN production, so there would be no grounds for a benefit for the NNLs. Based on these assumptions, it was hypothesized that the ISIB appears in those situations where the intended word is more frequent in communication than the mispronounced word (/θɪn/-/fɪn/). The results indicated no ISIB-T, i.e. all the native-accented items were more intelligible to the NNLs than the accented ones. There was no ISIB-L for the unambiguous items, i.e. the Cantonese and English understood these tokens to a similar extent. There emerged, however, an ISIB-L for the high-frequency words as expected, but also a small benefit for the low-frequency words. It was suggested that the reason for the benefit to arise is the L1 transfer, i.e. the NNLs assimilate the phonemes from the L2 with those in the NNLs' L1 (e.g. /θ/ to /f/) and these become homophones in their mental phonological system. Upon hearing a word containing the assimilated phoneme, they automatically recognize it as the more frequent word, as opposed to

native English listeners who are ready to interpret both the phonemes which actually exist in English. This study provided further evidence for the ISIB-L on the word level of measuring, and showed that it arises from the shared NLB as the L1 phonological system seems to play a crucial role. This also implies a possible benefit for NNLs from other NLBs whose L1 would be phonologically similar to the language of the speaker and thus might follow the same phoneme misinterpretation patterns. This was, however, not tested in this experiment. The relative word frequency was proven to be a potent factor affecting the ISIB as far as minimal-paired words as concerned. One of the merits of this work is that Cantonese participants were engaged, allowing the researches to investigate the ISIB for a different NN language than Mandarin which is so abundant in the ISIB research.

Hongyan and Heuven (2005) investigated the ISIB, focusing on multiple levels at which intelligibility can be measured and the benefit obtained. Specifically, they measured intelligibility on the lowest (segment), intermediate (word), and highest (sentence) levels. The researchers were interested in vowel, consonant, and consonant cluster perception, and word recognition in a semantically predictable and unpredictable sentences. As for the language background of the participants, mutual intelligibility of Chinese, Dutch (both NN), and American (native) speakers was of interest here. Each group comprised twenty talkers. They never lived in an English speaking country nor did they have a regular contact with a native English speaker. Otherwise the proficiency was not particularly defined and controlled for. The listeners for this experiment were participants of NLBs which matched those of the speakers, i.e. Chinese, Dutch, and American; each listener group had 36 participants. The results indicated that native American listeners, on average, were the best at understanding any speech at any level of measuring, be it native or NN speech. They were followed by the Dutch listeners who were not significantly worse at understanding native and NN English. The Chinese listeners proved to be generally the least successful in understanding and to be the most difficult to understand by other listener groups. Since the Dutch and Chinese listeners were reported to be at comparable level stages of English learning, the reason could not be their L2

proficiency. Rather, it was suggested that the better performance of the Dutch was caused by a closer genealogic distance between Dutch and English or by larger exposure of the Dutch to English. What is, however, of particular interest here is the intelligibility scores for listeners listening to NNSs who shared their NLB. Both groups of NNLs demonstrated an intelligibility benefit on the sentence level when listening to speakers with whom they shared the L1. Specifically, both NN groups showed better intelligibility scores than NLs when identifying low-predictability words in sentence-final positions for speakers from the same NLBs. This gave evidence for the MISIB-T for Chinese and Dutch listeners on the sentence level. Moreover, the Dutch listeners also showed a small benefit on the segmental level, i.e. they were more efficient than native American listeners at identifying Dutch-accented vowels. The MMISIB-T was also found for Chinese listeners listening to Dutch-accented speech. The Dutch speakers were more intelligible than native American speakers for the Chinese listeners in the cases of vowel perception and especially sentence intelligibility both in low- and high-predictability contexts. There was no MMISIB-T whatsoever for the Dutch listeners as the Chinese speech was the least intelligible for them in all instances. The chart showing MISIB-T for the Dutch and Chinese listeners and MMISIB-T for the Chinese listeners listening to Dutch sentences with low-predictability words can be seen in Figure 3.

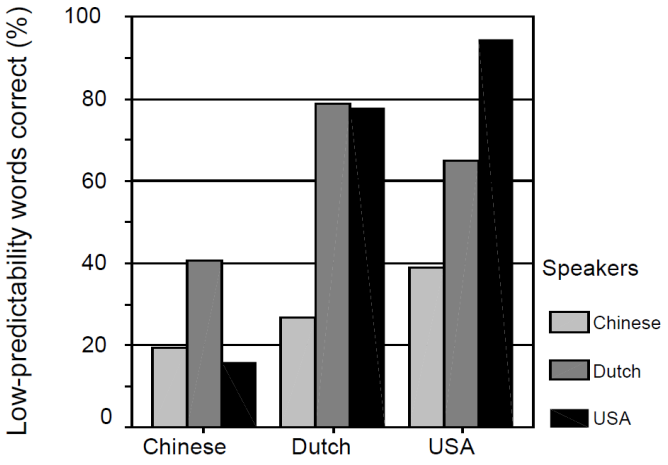

Figure 3. Percent correctly identified words in meaningful sentences with low-predictability contexts (Hongyan and Heuven, 2005).

There was no ISIB-L for the Chinese listeners. The Dutch listeners, however, demonstrated the ISIB-L in the test cases of consonantal clusters, word recognition, and sentences with low-predictability words.[5]

Thus, Hongyan and Heuven (2005) gave strong evidence for the MISIB-T in English for Chinese and Dutch listeners and also some evidence for MMISIB-T for Chinese listeners listening to Dutch speakers. Furthermore, it was proved that the benefit might originate at the very segmental level as the ISIB was found for vowel recognition, and that it extends also across the level of sentence intelligibility.

In a follow-up study, Hongyan and Heuven (2007) elaborated on the previous results. Specifically, they applied a different quantification method on the results, arguing for a relative rather than an absolute quantification of the ISIB phenomenon. They demonstrated this on the previous results of vowel identification by the three listener groups which can be seen in Figure 4 below:

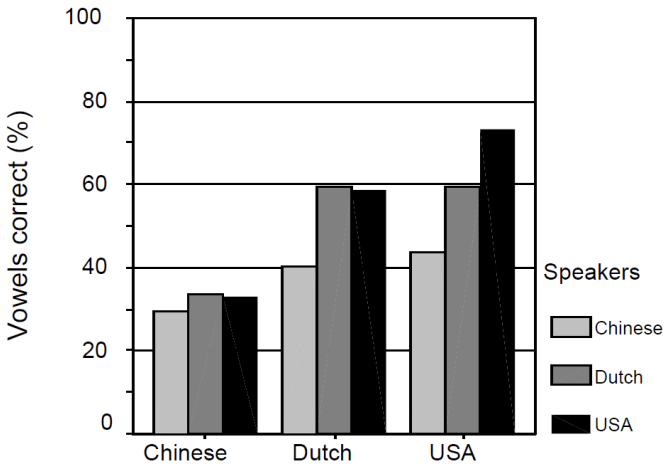

Figure 4. Percent correctly identified vowels broken down by listener group and by nationality of the speaker (Hongyan and Heuven, 2005).

[5] If the original concept of the ISIB by Bent and Bradlow (2003) was applied, the benefit would be much more extensive. There would be an ISIB-T for both NN groups at all three levels of intelligibility measuring (segment, word, sentence). Moreover, the ISIB-L for Dutch listeners would also be found across all levels.

Here, the Chinese listeners were a bit worse at identifying vowels produced by Chinese speakers than by English speakers. This difference was, however, not significant. Thus, it can be said that the Chinese listeners are equally successful in identifying Chinese-accented vowels as they are in identifying native English vowels.

Thus, there is a certain 'equality' benefit in the sense as Bent and Bradlow (2003) defined it. However, the Chinese speakers are not *more* intelligible in absolute terms as was shown above. This changes, however, when a relative measure is applied. This was done by computing the expected scores of intelligibility and comparing them to the actual, observed scores. The residuals then gave a relatively quantified score of intelligibility. The mean correct vowel identification across all listeners equalled 50%. This mean score was then corrected according to the main effects for listener and speaker L1, based on their NLBs. As for the listeners, the mean was corrected with -18 for the Chinese listeners, +3 for the Dutch, and +10 for the natives. The mean for speakers was corrected with -12 for the Chinese, +1 for the Dutch, and +6 for the Americans below or above the mean. The expected scores compared to the observed ones are shown in Table 2:

	Language background of				Exp.	Obs.	Δ
	Listener		Speaker				
1.	Mandarin	–18	Mandarin	–12	20	30	**+10**
2.	Mandarin	–18	Dutch	+1	33	34	+1
3.	Mandarin	–18	English	+6	38	34	–4
4.	Dutch	+3	Mandarin	–12	41	40	–1
5.	Dutch	+3	Dutch	+1	54	59	**+5**
6.	Dutch	+3	English	+6	59	59	0
7.	English	+10	Mandarin	–12	48	45	–3
8.	English	+10	Dutch	+1	61	61	0
9.	English	+10	English	+6	66	75	**+9**

Table 2. Expected vowel identification scores (% correct) on the basis of grand mean = 50% and main effects for Listener and Speaker L1. Observed scores (Obs.) and residuals (Δ) are indicated. Bolded delta's represent the interlanguage or native language benefit (Hongyan and Heuven, 2007).

The residuals (Δ) show that only in three listener-speaker combinations the observed scores are significantly better than the predicted scores such that there is a clear benefit in intelligibility for those listeners who share the NLB with the speakers. This is in favour of the MISIB-T theory. As can be seen, when the relative measure is applied, the MMISIB-T vanishes as for example the Mandarin listeners do not actually score better than predicted when listening to the Dutch listeners.

In the same paper, Hongyan and Heuven subsequently applied the relative measure on Bent and Bradlow (2003), reanalysing their results. The intelligibility results were treated in the same way as were the results from Hang and Heuven (2005) (grand mean corrected, based on the main effects for listener and speaker L1), and Table 3 is the outcome.

	Language background of				Exp.	Obs.	Δ
	Listener		Speaker				
1.	Chinese	–9	Chinese	–5	57	64	**+7**
2.		–9	Korean	+4	66	66	0
3.		–9	American	+2	64	56	–8
4.	Korean	–6	Chinese	–5	60	60	0
5.		–6	Korean	+4	69	74	**+5**
6.		–6	American	+2	67	60	–7
7.	Other NN	–5	Chinese	–5	61	62	+1
8.		–5	Korean	+4	70	70	0
9.		–5	American	+2	68	67	–1
10.	American	+21	Chinese	–5	87	77	–10
11.		+21	Korean	+4	96	91	–5
12.		+21	American	+2	94	109	**+15**

Table 3. Expected scores on the basis of grand mean = 71% and main effects for Listener and Speaker L1 for each combination of factor levels. The observed results taken from Bent and Bradlow (2003) (Hongyan and Heuven, 2007).

In the re-analysed results, a clear MISIB-T persists. However, what seems to be totally absent is any kind of MMISIB-T as neither the Chinese-Dutch nor Dutch-Chinese NN listener-talker pairs showed better than expected intelligibility scores. The American listeners remain to be most effective in understanding their fellow

American speakers, but experience severe problems when listening to NN speech, be it Chinese or Korean, in these relative terms. In absolute terms, however, the native American listeners outperformed all the other listener groups in Bent and Bradlow (2003).

Thus, when a relative rather than absolute quantification of the ISIB is implemented, the MMISIB-T does not seem to persist. What is, however, still clearly present is the MISIB-T. This re-confirms the results of Bent and Bradlow (2003), demonstrating that the MISIB-T exists when quantified in both absolute and relative terms.

2.2.6. Follow-up research against the ISIB

Although it might seem from the preceding overview that the ISIB is a phenomenon very likely to appear whenever NN talker-listener pairs are involved, there are works that do not address the issue as optimistically. Major et al. (2002) is one of the papers that showed an ISIB for certain NNLs but also proved that the phenomenon cannot be always taken for granted. They tested Japanese, Spanish, Chinese and American groups of listeners who listened to lectures given in English by speakers with whom the listeners either shared or did not share the L1. When the listeners underwent a comprehension test based on the lectures, it was discovered that both native and NN listeners were poorer at comprehension when listening to accented speech. There was a certain benefit measured for a Spanish-Spanish listener-speaker pair. Surprisingly however, when the interaction between Chinese speakers and listeners was examined, the results showed that the Chinese listeners scored lower when listening to their fellow Chinese speakers than speakers from other NLBs. The Chinese listeners actually experienced a matched interlanguage intelligibility *disadvantage*. It must be noted, however, that other factors, e.g. the proficiency of the speakers and listeners, were not taken into account, which may have unfairly spoken against the possible emergence of the ISIB, so firm conclusions cannot be made.

Another work which did not manage to find convincing evidence for the ISIB is Munro et al. (2006). They investigated a common response to accented speech by NNLs from various NLBs and by NLs, i.e. a possible MISIB-L and MMISIB-L. Because there were no native English speakers, the ISIB-T could not be investigated. English utterances by Cantonese, Japanese, Spanish and Polish speakers were presented to Cantonese, Japanese, Mandarin and English listeners. All the three dimensions of speech perception, i.e. intelligibility, comprehensibility, and accentedness, were rated. The results showed that the NN listener groups tended to agree on all three of them, indicating a shared response to L2 accented English. However, they did not display any consistent and prominent advantage in intelligibility when listening to speakers sharing their NLB. Interestingly, NLs' ratings of the three dimensions were not significantly poorer than those of NNLs, i.e. NLs did not have much trouble understanding NN speech. This showed that there may indeed be a shared response to NN speech, no matter if the listener is native or non-native. This is not in line with previous studies which clearly showed that NLs tend to have difficulties with intelligibility of accented speech and that NNLs enjoy a benefit when perceiving their-L1-accented speech. One possible reason that may have contributed to this is the fact that no embedded noise was used in the stimuli for this research. Had the noise been added, the gap between the perception of NN and NLs would have probably widened (see Rogers et al. 2004). Munro et al. (2006) conclude that the LF factor (see section 2.2.1.1.) undoubtedly comes to play a role for the listener when perceiving foreign-accented speech, but the relatively strong shared response indicates that it is the SP factor that is more potent. It is suggested that the LF factors including the speaker-listener shared language background, which may give rise to the ISIB, are cast aside.

Smith et al. (2009) also offered further evidence against the ISIB. They tested perception of word-final stops in German-accented English and in native English by German NNLs as well as NLs. As German neutralizes some of the stops in speech while in English the stop quality has a meaning-determining value, it should be expected that Germans will have an advantage in intelligibility of German-accented

speech. More specifically, based on the research favouring the ISIB theory, the German listeners should have an intelligibility benefit over the NLs when listening to German-accented English, i.e. ISIB-L, and an advantage in understanding the accented speech better than the native English speech, i.e. ISIB-T. To the contrary, however, it was proven that the German listeners identified the stops in native English productions more efficiently than in the accented speech. Moreover, the German listeners did not even demonstrate an ISIB-L as they did not show any advantage in understanding the German-accented production better than the native English listeners did. It remains unknown why neither subtype of the ISIB was found. Possibly again, it could partly be explained by the fact that the proficiency of the talkers in the experiment was not consistent as the investigation of the ISIB phenomenon was not the primary goal of this study. Moreover, proficiency of the listeners was not controlled for at all. It can only be speculated whether any benefit for the German listeners would emerge if the talker and listener proficiency were controlled for better, but the evidence presented in sections 2.2.4. and 2.2.3. suggests it probably would.

Stibbard and Lee (2006) decided to re-test the hypothesis of the mismatched ISIB-T with regard to speaker proficiency in the fashion of Bent and Bradlow (2003). Bent and Bradlow (2003) found some evidence for MMISIB-T for Chinese and mixed group listeners listening to a HP Korean speaker. Stibbard and Lee (2006) also took Korean LP and HP talkers but also a Saudi Arabian one who represents a very rare participant in terms of the NLB within the scope of the ISIB research. The listeners were recruited from the NLBs of the speakers, accompanied by a group of native English listeners and a mixed group of participants from various NLBs. The listeners were subjected to a word recognition test. The results can be seen in the Table 4:

Listener group	Talker				
	Korean high proficiency	Saudi high proficiency	Native English	Korean low proficiency	Saudi low proficiency
Korean	91.69 (8.35)	80.55 (7.08)	89.50 (6.85)	82.38 (9.03)	61.24 (9.73)
Saudi Arabian	89.83 (12.23)	91.54 (18.87)	91.07 (17.59)	71.96 (11.47)	77.71 (8.84)
Non-native mixed L1	89.03 (13.24)	92.59 (12.31)	91.93 (11.74)	76.07 (11.95)	75.64 (12.76)
Native English	106.79 (11.95)	110.31 (6.72)	112.42 (11.69)	89.67 (8.07)	79.85 (5.42)

Table 4. Scores on word recognition test expressed as rationalized arcsine units (Studebaker, 1985) with standard deviations in parentheses (Stibbard and Lee, 2006).

There was no evidence found for any intelligibility benefit as far as LP speakers were concerned, no matter who the listeners were, which was labelled a 'mismatched interlanguage intelligibility detriment'. Further evidence against the MMISIB was provided by the fact that the Korean listener group gave a worse rating also to the HP Saudi Arabian speaker than to HP Korean, native English and even LP Korean speaker. On the other hand, this work provided some evidence for the matched ISIB-T as both the Korean and Saudi Arabian listeners performed better on the HP speakers sharing their NLB. This is in line with Bent and Bradlow (2003). The MMISIB-T was, however, disproven by this research, which is evidence that the MMISIB does not have to be pervasive across all languages. Bent and Bradlow (2003) showed the benefit emerged for NN listeners listening to the Korean speaker while Stibbard and Lee (2006) failed to prove it for a Saudi Arabian talker.

Alongside the presented research which is mostly against the ISIB theory, some of the works introduced in section 2.2.3 and 2.2.4. should be mentioned here as well as they did not manage to prove the benefit completely or they gave evidence for only one subtype and not the other one, i.e. either ISIB-T or -L. These are, for example Hayes-Harb (2008) or Kau Chu and Tau (2010) who did not prove the ISIB-T while the results of Bent and Bradlow (2003) did not show any ISIB-L as all the NNLs

were outperformed by the NLs when listening to native as well as NN speech. This various results mentioned indicate that the ISIB-T and -L are indeed two different phenomena which should be considered separately (see Xie et al. 2013).

2.2.7. Chapter summary

To sum up the findings from the research in the interlanguage speech intelligibility benefit, it can be seen that the phenomenon is of a complex character and does not have to be pervasive. That is to say, the benefit emerges only under specific conditions. One also has to consider each subtype of the ISIB, i.e. ISIB-T and -L, separately. The matched and mismatched types of the benefit (MISIB and MMISIB, respectively) have to be carefully distinguished as well. While the MISIB emerges relatively often, given certain conditions have been met (Bent and Bradlow, 2003; Hayes-Harb et al., 2008; van Wijngaarden, 2001), the MMISIB seems to be much less stable. The MMISIB has been discovered in some research (Bent and Bradlow, 2003; Hongyan and Heuven, 2005) but when, for example, quantified in a relative and not absolute way (Hongyan and Heuven, 2007), the benefit disappeared. When a stricter conception of the ISIB in the Stibbard and Lee (2006) fashion[6] was applied, the benefit mostly vanished, which is a fact demonstrating the instability of the phenomenon.

Perhaps the most potent factor affecting the matched and mismatched ISIB proved to be the proficiency of the NN speakers as well as the listeners involved. In this matter, however, the ISIB-T and -L have to be considered separately as they both exhibit different conditions under which they are valid. As for the ISIB-T, Bent and Bradlow (2003) and Xie et al. (2013) found the advantage in intelligibility only for HP speakers. Van Wijngaarden (2002), Pinet et al. (2010) and Xie et al. (2013) examined the proficiency of the listeners and showed that predominantly LP listeners

[6] Stibbard and Lee (2006) argue that the intelligibility of NN speech for NN listeners has to be more intelligible than native speech. If NN speech is 'only' equally intelligible as native speech, one cannot consider this a benefit as such.

experience the benefit. As far as the ISIB-L is concerned, Hayes-Harb (2008) proved the emergence of the advantage for LP speakers while, to the contrary, Song (2011) discovered the benefit also for HP talkers. Both of these works, however, showed the benefit for LP listeners. Thus, although the two subtypes of the benefit are different phenomena, there seems to be one major intersection. That is that the ISIB holds for LP proficiency listeners. Most of the evidence also confirms that the ISIB usually appears when HP speakers are involved. Therefore, the talker-listener pair most likely to exhibit the ISIB is HP-LP.

Another factor that may influence the emergence of the ISIB is the listeners' experience with the particular accent they are perceiving in the NN speech (Baese-Berk, 2013). Moreover, an accent which sounds similar to the listener's own production facilitates intelligibility as well (Weber et al., 2011). Furthermore, what will also play a role in emergence of the ISIB is the genealogic difference between L1 and L2 (Hongyan and Heuven (2005). As the overwhelming majority of research concerns mutual intelligibility of Chinese (Mandarin) participants, speakers and listeners from more diverse NLBs should be included so that the ISIB phenomenon was put to a more complex test and could possibly be generalized.

From a technical point of view, methodology of the research may also influence the observed amount of the ISIB. What appears to be a factor is for example the level of measuring. Intelligibility can be measured on the very segmental level, e.g. perception of vowels or consonants in minimal-paired nonwords (Xie et al., 2013). This is connected with considering the intelligibility on the word level, i.e. measuring the efficiency of perception of isolated words with no or little semantic or syntactic context (Hayes-Harb et al., 2008; Hongyan and Heuven, 2005). Some works rate intelligibility on the whole-sentence level, using keywords which are supposed to be identified by the listeners (Bent and Bradlow, 2003; Hongyan and Heuven, 2005). Finally, intelligibility can be measured on the suprasegmental, prosodic level, e.g. (Song, 2011; Pinet et al., 2010). As, however, Hongyan and Heuven (2005) show, a certain but differing amount of the benefit can be observed at all levels of measuring.

Some research was presented in section 2.2.5. that disproved the ISIB theory (Major et al., 2002; Smith et al., 2009; Munro et al., 2006; Stibbard and Lee, 2006). These works therefore must have encountered or created specific conditions that caused the non-emergence of the ISIB phenomenon by, for example, neglecting one of the important factors influencing the ISIB. To give an example, Major et al. (2006) or Smith et al. (2009) did not take into account the factor of talker-listener proficiency, which appears to be the most crucial factor, and failed to discover the intelligibility benefit for their NN listeners.

When the aforementioned conditions are met, an ISIB can be usually observed both on the word and whole-sentence level, which are the two basic levels relevant to everyday communication, and also on the very segmental level of measuring.

2.3. Accent and credibility

The following chapter will provide a discussion of negative impacts a foreign accent may have. It will primarily be focused on the issue of reduced credibility and reliability, resulting from the presence of a foreign accent in speech.

2.3.1. Information processing

Perhaps the most essential and incessant process of an awake mind is information signal evaluation and consequent decision-making. As for example Ferguson and Zayas (2009) showed, people evaluate information rapidly and in an automatic fashion in the ever-changing environment. These evaluations then trigger behavioural responses away from threats and towards rewards. The evaluation takes place even when people do not intend to evaluate a stimulus so the process can be completely subconscious (p. 362-3).

In order for a person to direct themselves towards a reward, it is important to distinguish between reliable, i.e. credible, and unreliable source of information. Concerning spoken signal evaluation, credibility judgments were proven to depend on a number of variables. Credibility may be affected by the appearance of the source or by how reasonable the information sounds (Miller and Hewgill, 1964). People also believe the information they are able to comprehend easily rather than that they have hard time understanding (Gilbert, 1991). Connected with the comprehensibility of the message is the aspect of foreign-accented speech. Such speech may have two main adverse effects on how the information and speaker are perceived. Firstly, the accent can interfere with comprehensibility of the speech and by that decrease intelligibility of the message (see section 2.2.1.2. for more details). Secondly and importantly for this thesis, it is suggested that a foreign accent in speech may reduce its credibility. This can happen for two reasons: 1) The accent serves as a signal,[7] and 2) the accent decreases processing fluency (Lev-Ari and

[7] Munro (2003) refers to this as 'accent stereotyping' (p. 39).

Keysar, 2010). In the case of the accent serving as a signal, it is prejudice that reduces the credibility of the accented speaker. As Munro (2003) puts it, "accent is just one of a number of characteristics, along with skin color, dress, or mannerisms, that may be used to identify someone as 'foreign' or 'different' and that can serve as an excuse for discriminatory treatment" (p. 39). It is important to note here that prejudice mostly works subconsciously so the bias against NNSs does not have to be intentional.

This is evidenced by the fact that even somebody as innocent and impartial as little children prefers native speakers of their language to accented talkers, i.e. they hold subconscious prejudice against what sounds strange and unfamiliar (Kinzler et al., 2007). This study tested 10-month-old French and American infants and 5-year-old American children and investigated how they responded to people speaking a foreign language or foreign-accented English. The results showed that both the French and American infants preferred to accept a toy from a person who had previously spoken to them in their own native language. The person speaking a foreign language received significantly lower trust. The 5-year-old American children opted to be friends with a person who spoke English as they did, rather than with a French-speaking child, and, importantly here, preferred to be friends with a standard-accented person rather than with a foreign-accented speaker. Thus, the foreign-accented speech which was in fact fully understood by the children was approached as negatively as a completely incomprehensible foreign language. Therefore, it seems clear that accented-speech indeed entails a considerable amount of prejudice which must be subconscious, as it can be observed even in small infants who do not consciously categorize individuals into language- or racially-based social groups and respond to their environment on a largely random basis (Nesdale, 2000).

The second impact of a foreign accent is that it increases difficulty of processing for the listener (Munro and Derwing, 1995b), processing fluency "[having] been shown to be an influential cue in a wide array of judgments," (Oppenheimer, 2008, p. 237). In other words, when a NL perceives accented utterance, such speech is harder to comprehend and process, i.e. they must make more effort to understand. As a result

of that, the listener may deem such information and speaker as less trustworthy and reliable. The more fluent the information processing is, the more credible the source sounds. It is, however, not only increased credibility that stems from processing fluency. As Lev-Ari and Keysar (2010) list it, what is easier to process was found to be more familiar (Whittlesea et al., 1990), pleasant (Reber et al., 2004), louder (Jacoby et al., 1988), or less risky (Song and Schwarz, 2009). Moreover, such an advantage of high processing fluency does not have to be limited only to speech. When the font colour of a written statement makes it easier to read, the credibility of such a statement is found high (Reber and Schwarz, 1999). Lev-Ari and Keysar (2010) assert that "the attribution of processing ease to truthfulness seems to be learned correlations between the two," (p. 1093). What is true is more likely to be repeated than what is false or incorrect, and what is repeated is processed more easily and fluently and thus possibly judged as more credible (p. 1093).

2.3.2. Handicap of non-standard-accented speakers

As a result of prejudice against accented talkers and (or) higher processing difficulty of accented utterances, foreign-accented speech and speakers are generally perceived differently as opposed to NSs. As "accent may affect listeners' impressions of speakers [...], it is now widely accepted that standard accents are rated more positively than nonstandard accents," (Dixon, 2002, p. 162). Munro (2003) distinguishes between three types of discrimination cases based on the presence of a foreign accent in speech:

> 1. Cases in which accent is an aspect of language proficiency considered in hiring decisions;
> 2. Cases of discrimination in employment and tenancy due to accent stereotyping;
> 3. Cases of harassment of second-language users in which accent is a factor (p. 43).

Thus, although credibility and reliability are undoubtedly essential aspects of communication for any speaker of any language, NN accented speakers are

discriminated against and considered less trustworthy than NSs. There is indeed a considerable amount of evidence for such a handicap.

2.3.2.1. Credibility reduction effect of a standardized or regional accent

Rakic et al. (2011), for example, investigated native German listeners' perception of speakers of regional German accents. An ostensible job interview was organized and the listeners' response towards speakers of the Saxon, Bavarian, and Berlin accents was examined. As hypothesized, the non-standard accents resulted in lower ratings of competence and hirability. The mere fact that the speakers spoke with a regional accent at the job interview led to a detriment in the impression the candidates gave. Dixon et al. (2002) also engaged a speaker with a regional accent. They tested if the presence of the Birmingham accent in English speech has an effect on the attribution of guilt for a speaker of this accent. Native English listeners listened to a recording of an interrogation in which a male policeman questioned a criminal speaking either in the Birmingham accent or standard English accent. The results indicated that the non-standard-accented speaker was rated as significantly guiltier than the standard-accented one, providing further evidence that non-standard pronunciation may serve as a cue to discrimination against such speakers. Similarly, Lalwany et al. (2005) compared the native English listeners' response towards product advertisements spoken in standard British accent and Singaporean (Singlish) accent which is considered a standardized English variety. However, it was discovered that the Singlish-accented speech is deemed as less credible, and overall less favourable attitude towards the advertisement was indicated by standard British accent speakers. Interestingly however, the Singlish accent attracted more attention towards the ad. Nevertheless, this does not change anything on the fact that non-standard accent in English entails reduced credibility and causes less positive attitude of a NL towards the NNS and the information this speaker is conveying.

2.3.2.2. Credibility reduction effect of a foreign accent

The studies mentioned in the previous paragraph looked into the effect of standardized or regional English accents. However, there is also a great deal of research that is concerned with another type of non-standard accent, i.e. foreign accent. Cheung (2013) for example investigated native Cantonese speakers and their rating of quality of three simultaneous interpretations in Cantonese. Two of the three interpretations were spoken in a foreign accent (Mandarin and English) and one in native Cantonese accent. It was discovered that the effect of a NN accent is the same as the effect of a regional accent, as the NLs attributed lower quality to those two interpretations which were delivered in foreign-accented speech than to that presented in standard native Cantonese speech. Similarly to the explanation of Lev-Ari and Keysar (2010) , it was suggested that the reduced reliability of the accented stimuli was caused by negative stereotypes the accent had triggered, i.e. prejudice, and (or) by increased processing difficulty for the NLs. Hosoda et al. (2012) conducted research that looked into a possible discrimination against Hispanic population segment in the USA in terms of their perceived competence, employability, or likelihood of promotion. The results indicated strong prejudice against the Mexican-Spanish-accented speaker such that the accented candidate for a software engineering position was rated as less suitable for the job, less likely to be promoted and had a smaller chance to be hired than a standard-accented American speaker. This provides further evidence that there is a bias against foreign-accented speech and speakers on the level of competence. Tsalikis (1991) focused on Greek-accented English and compared such productions to standard American-accented speech. Native American listeners judged the Greek-accented and standard-accented speakers in terms of their credibility, competence, and even friendliness and helpfulness. Similarly to the previously mentioned research, more favourable judgements were elicited from NLs of those productions that were spoken in standard-English-accented form. The Greek-accented speakers were judged as less trustworthy and less competent. Interestingly however, as for the friendliness and helpfulness aspects, the foreign-accented speakers were rated equally positively as

the NSs. In other words, the foreign-accented speaker may be deemed as less credible but at the same time can be considered equal to the NS on the social-attractiveness level. Moreover, this effect was not observed only in English listeners but also extended to Japanese ones in other research. Tsurutani (2012) had native Japanese participants listen to short passages in Japanese spoken by native Japanese speakers and NN English speakers. In terms of integrity and competence, the NNSs were again rated more negatively than the NSs. What was, however, replicated was the finding that the NNSs were considered equally socially attractive as the NSs.

It is not, however, only the NLs who seem to discriminate against NNSs, be it consciously or subconsciously. The NNSs themselves can have a feeling of less belonging in the host country as a result of their foreign accent, and thus adopt a form of self-discrimination. Gluszek and Dovidio (2010) investigated how the foreign-accented speakers consider themselves in various communication contexts in the United States of America. It was shown that the NNSs in fact *expect* the stigmatization and certain discrimination, which leads to actual communication problems such speakers eventually do experience. As a result of stigmatization expectation and problems in communication, the NNSs felt less belonging in the USA. The lack of home feeling in the host country can in fact be one of the reasons why the NLs deem the NNSs as less competent and credible, as the NNSs may give the impression of lack of self-confidence and assuredness.

However, outside the context of a host country where the NNS may feel rootless because their pronunciation does not fit in the environment, they may experience a reverse effect when being involved in a social interaction with a speaker from the same or similar NLB, i.e. a Czech person speaking English who would feel stigmatized in the United States, but feels the opposite way when engaged in conversation with another Czech person speaking English. Dahlbäck (2007) examined a situation in which American and Swedish listeners were presented with spoken information produced by either an American or Swedish person. The listeners were supposed to rate the information in terms of the speakers' perceived knowledge of the topic they had been talking about. What was found was that each participant

group preferred that speaker with whom they shared the NLB, i.e. the Swedish listeners inclined towards the Swedish speaker and deemed them as more knowledgeable, while the Americans preferred the native American speaker. Based on these results, it was suggested that listeners would mostly prefer the accent which is similar to their own. This is in fact a more abstract manifestation of the interlanguage benefit two people sharing the NLB may experience, something that Dahlbäck (2007) calls similarity-attraction effect, and something that might be in fact called the interlanguage speech *credibility* benefit.

As can be seen, most of the research into the dimensions of competence, credibility and reliability reduction of foreign-accented speech investigates *if* there is any detriment for and discrimination against talkers speaking with a foreign accent. Not much research, however, pursue the evidence for *what* exactly it is that reduces the credibility of such speakers.

Lev-Ari and Keysar (2010) specifically aimed to prove that a person speaking English with a foreign accent is disadvantaged in credibility as a result of increased processing difficulty of the signal for a NL. Twenty-eight native American listeners were engaged who listened to trivia statements recorded by 3 NSs of English and 6 NNSs (3 with a mild and 3 with a heavy accent). Importantly, to rule out the factor of prejudice, the listeners were assured that the speakers were only repeating a message that had been given to them by a native speaker. The participants were then supposed to mark on a 14 cm line, which was labelled 'definitely false' at the one side and 'definitely true' on the other, if the statements they had just heard were true or false. The results indicated that, as predicted, the NNSs were judged as less credible by the NLs even when they were only reproducing a fact given to them by a NS. Figure 5 presents the results:

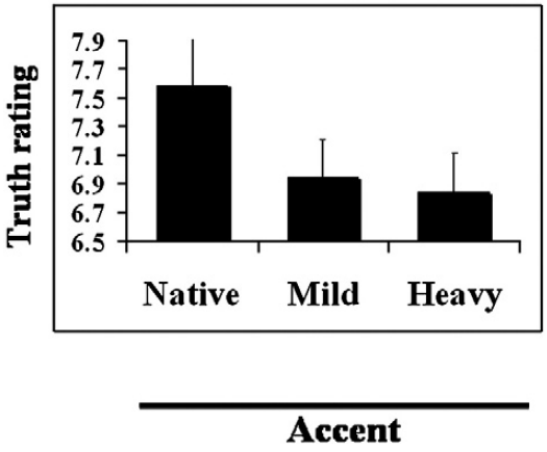

Figure 5. Truth ratings as a function of accent. The y axis indicates distance in cm from the Definitely False pole of the scale, so higher numbers indicate higher perceived truth (Lev-Ari and Keysar, 2010).

The NLs automatically and subconsciously misattribute the processing difficulty they experience to credibility of the statement. Interestingly, when the NLs were informed of the source of their difficulty and the effect it might have, they consciously tried not to misattribute the higher processing difficulty to credibility. They were successful with mildly accented speakers, but did not believe the heavily accented talkers even when they were aware that the lower processing fluency can have a detrimental impact on their trust. As can be seen in Figure 5, the extent of a foreign accent is negatively correlated with the trustworthiness of the statement, i.e. the heavier the accent, the less credible the utterance, as a result of decreased processing fluency for the NLs, and not as a result of prejudice.

2.3.3. Chapter summary

A considerable amount of research evidences that not only the visual dimension of the source is important for judgments of competence, reliability and credibility. It is also the language dimension that plays a crucial role, accent being one of the essential aspects. Non-standard-accented speakers are approached in a different way

by NLs than NSs are such that accented-talkers are deemed as less competent. Such a negative attitude towards accented speakers may be caused by two factors: 1) negative stereotypes triggered by the accent, leading to prejudice, and 2) higher processing difficulty of the accented speech for NLs (Lev-Ari and Keysar, 2010). As a result of one or both of the aforementioned factors, judgments of smaller competence, lower chance of hirability, or attribution of more guilt may be given by NLs to *regional*-accented speakers (Rakic et al., 2011; Dixon, 2002). Importantly for this work, speakers having a *foreign* accent may experience a similar negative effect of their non-standard pronunciation. The NNSs were proven to be judged as less suitable for a certain job position, and also less competent (Hosoda et al., 2012). Further, an interpretation was considered as being of worse quality when delivered in foreign-accented speech than in native-accented speech (Cheung, 2013). Tsalikis (1991) showed that foreign-accented speakers received lower credibility ratings from NLs than NSs did. Lev-Ari and Keysar (2010) focused specifically on the factor of lower processing fluency causing the reduced credibility and proved that NLs indeed misattributed this difficulty to decreased trustworthiness of NNSs. An interesting phenomenon called a similarity-attraction effect was observed in the experiment of Dahlbäck (2007) in which Swedish listeners rated an English speaking Swede as more knowledgeable than a native American speaker.), implying higher credibility towards a speaker who shares the NLB with the listener.

The presented research sheds some light on how NNSs are perceived in their host countries and has important implications for both the NNSs who should be aware of the fact that their accent may serve as a discriminative tool for NLs, but also for NLs who should try to realize their discrimination against non-standard-accented speakers and possibly avoid such bias when there is no proper reason for it. However, since the evaluative process is subconscious, the prospect for NLs avoiding the bias is not very good. What can, however, serve as a small consolation for foreign-accented speakers is the fact that the prejudice against them applies 'only' to the judgements of credibility and competence, i.e. status-related dimensions, and not to the social-attractiveness dimension. The judgments of friendliness or helpfulness of foreign-

accented speakers were shown to be equally positive as those of native-accented ones (Tsalikis, 1991; Tsuratani, 2012).

3. THE RESEARCH

In this chapter, two experiments investigating comprehensibility and credibility of Czech-accented English speech to Czech and native American listeners will be presented. The methodology of the experiment will be described in detail, the results will be analyzed and their interpretation and implications provided.

3.1. Research questions and hypotheses

The fundamental question of this research is whether Czech-accented English sounds at least as credible to Czech listeners (CzLs) as native English speech does, and if native American listeners (NLs) deem such accented speech as less credible than native English speech.

Based on the research of Lev-Ari and Keysar (2010) who discovered reduced credibility of foreign-accented speakers to native American listeners due to higher processing difficulty,[8] Czech-accented speech should be perceived as less credible than native English speech by native American listeners. However, taking into account the results of the interlanguage speech intelligibility benefit research,[9] for Czech listeners and listeners from other NLBs, Czech-accented utterances should be at least as intelligible and comprehensible as native English speech is.[10] Therefore, they should not experience much processing difficulty with it, which should result in unimpaired credibility. Thus, the hypotheses of the following experiments are:

[8] The research in introduced in section 2.3.2.2.

[9] The review of this research was the subject of section 2.2.

[10] It is assumed that intelligibility and comprehensibility are correlated. For further details, see section 2.2.1.2.

1) English-accented speech will be more comprehensible, i.e. will take less effort and time to understand, for native English listeners than Czech-accented English will be. This would be a manifestation of a native language benefit.[11]

2) Czech-accented speech will be at least equally comprehensible, i.e. will not take more effort and time to understand, for Czech listeners as native English speech will be, and Czech listeners will be better at comprehending Czech-accented English than native American listeners. This could be called a matched interlanguage speech comprehensibility benefit for talkers and listeners.[12]

3) Czech-accented speech will be less credible than native English speech to native American listeners.

4) Czech speakers will be at least as credible as native English speakers to Czech listeners, and Czech listeners will believe more their fellow Czech talkers than native American listeners will. This would give rise to a matched interlanguage credibility benefit for talkers and listeners.

5) Czech speakers will be at least as credible as native English speakers to NN listeners from various NLBs. This would be a manifestation of a mismatched interlanguage credibility benefit for talkers.

Stibbard and Lee (2006) suggested that, concerning the interlanguage speech intelligibility benefit, an actual advantage in intelligibility is only such a situation in which the intelligibility of NN speech for a NN listener is *higher than*, and not only *equal to*, the intelligibility of native speech. I claim that this specification does not have to be applied when investigating the interlanguage speech *credibility* benefit.

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[11] This is a label Hongyan and Heuven (2007) gave to the fact that the native-accented language is more comprehensible and intelligible for NLs than the native language accented in any way is. We can compare this to the interlanguage benefit which is supposed to emerge for NN speakers and listeners who either share or do not share the NLB.

[12] Hayes-Harb et al. (2008) divided the interlanguage benefit into two subtypes, a benefit for talkers and for listeners. For further information see section 2.2.2.

The reason is that I suggest a NS will always sound credible to NNLs even if more processing difficulty takes place and even if not all the words are understood perfectly. As native speech should always be highly credible, there is no reason for NN speech to be even more credible in order for the benefit to arise. Thus, also those situations in which NNSs will be equally credible as NSs to NNLs will be considered as instances of an interlanguage speech credibility benefit.

I conducted two perceptual experiments in order to prove or refute the hypotheses given in section 3.1. Experiment 1 pursues the issue of processing difficulty of and reaction time (RT) to Czech-accented utterances as rated by Czech and native American listeners (hypotheses 1-2). Experiment 2 is concerned with the question of credibility of Czech-accented speech to Czech listeners, listeners coming from a variety of NLBs, and native American listeners (hypotheses 3-5). Lastly, a correlation of mean comprehensibility and credibility ratings given by Czech or American listeners to individual Czech- or English-accented stimuli is made to reveal if it is the processing difficulty that causes reduced credibility of a statement.

3.2. Experiment 1

The purpose of Experiment 1 is to measure the RT of Czech and American listeners to Czech-accented and native-English-accented utterances. It also aims to rate perceived comprehensibility of the utterances, i.e. the effort one has to make to understand.[13] The NLs are hypothesized to show higher processing difficulty and more RT towards Czech-accented utterances than to native English stimuli. The CzLs are expected not to take more time to react to and experience lower processing difficulty for Czech-accented statements than for native English statements.

[13] For discussion on the difference and relationships between comprehensibility, intelligibility and accentedness, see section 2.2.1.2.

3.2.1. Method

Speakers and speech stimuli

Four native American speakers (NSs, two male and two female) and four Czech speakers (CzSs, two male and two female) recorded English trivia statements such as *Listening to music when eating influences your taste*.[14] These statements were given to the speakers and they were instructed to read them out in a natural, matter-of-fact tone. The speakers were unaware of what the recordings were going to serve for. The recording took place in a sound-proof booth with high fidelity audio equipment. Each of the speakers recorded two warm-up statements which were later discarded and then thirty more statements. This gave a total number of 240 stimuli out of which fifty statements were selected for use. Twenty-five of the finally selected stimuli were spoken by the NSs and twenty-five by the CzSs. Half of the fifty statements were true and half were false. The speech stimuli were additionally embedded with speech-shaped noise with signal-to-noise ratio of 0 dB.[15] This was supposed to make a bigger difference between NLs' perception of Czech-accented speech and native speech (see Rogers et al., 2004), while the added noise should not be such a big complication for CzLs who would still be able to compensate for some of the detriment the noise would cause. The CzSs were all selected from advanced English students studying their fourth or fifth year of the English philology course at the Department of English and American Studies at Palacký University Olomouc. This choice was supposed to control for relatively high phonological proficiency of the Czech speakers. The NSs were not selected according to any special criteria.

Listeners

Eighteen Czech listeners (CzLs) and three native American listeners (NLs) participated in the experiment. The CzLs were all selected from first-year students of

[14] Most of the statements come from the research of Lev-Ari and Keysar (2010). The rest was invented newly.

[15] 0 dB signal-to-noise ratio corresponds to a 1:1 signal:noise ratio.

the English philology course at the Department of English and American Studies at Palacký University Olomouc, so relatively low English proficiency was assumed. None of the CzLs had spent a longer period of time in an English-speaking country. The NLs' LOR in the Czech Republic ranged from 96 to 200 months (mean 165).

Procedure

Each of the listeners listened to all 50 statements in a randomized order in a quiet room equipped with computers. Headphones were used and the perceptual test was run in the Praat computer software. First six statements served as practice ones after which the participants were allowed to ask questions if there was anything unclear. The other 44 statements comprised the actual experiment. The participants were informed that the statements were recorded by random people. They were also instructed to pay attention only to the individual words of the statements, not the meaning of the statements at all. The sole aim of this experiment was to elicit the RTs and comprehensibility ratings from the Czech and American listeners listening to the Czech- and native-English-accented utterances. Each time, they heard a sentence which was preceded by a 2-second initial silence. In the Praat test on a computer, they were supposed to press the space bar as soon as they understood each word in that statement. If they did not understand a word or words, they were supposed to click the *don't understand* button and this statement was not measured for this particular listener. After giving the RT, the listeners were asked to rate on a 7-point scale how hard it was to identify the words of the statement (comprehensibility); the scale ranged from *1 = hard* to *7 = easy*. When they completed the two tasks, they immediately proceeded to the next statement. There was no possibility to replay the individual statements. When the listeners rated all the sentences, they were asked to fill in a simple questionnaire in which the CzLs and NLs gave their initials and indicated their sex and the number of months they had spent in an English-speaking country or the Czech Republic, respectively. The listening session took about 30 minutes.

3.2.2. Results

The stimuli durations were subtracted from the RT judgments to acquire the true RTs to the stimuli. Subsequently, the mean RTs of CzLs and NLs towards the Czech- and English-accented stimuli were computed. The same was done for the comprehensibility ratings. One true-value stimulus recorded by a native American male speaker was excluded from the analysis as it was an outlier, i.e. it skewed the ratings of both CzLs and NLs due to its shortness and abruptness. The RTs were submitted to a repeated measures ANOVA with raters' native language as the between-subject variable (L1, two levels: Czech, English) and the accent of the stimulus as the within-subject variable (Accent, two levels: Czech-accented stimuli, English-accented stimuli). The L1 did not have a significant main effect on RTs and neither did the Accent. Their interaction was not significant either ($p > 0.2$). However, the CzLs tended to be faster with Czech-accented stimuli than English-accented stimuli whereas the NLs did not differ in such a way between the accents (see Figure 6).

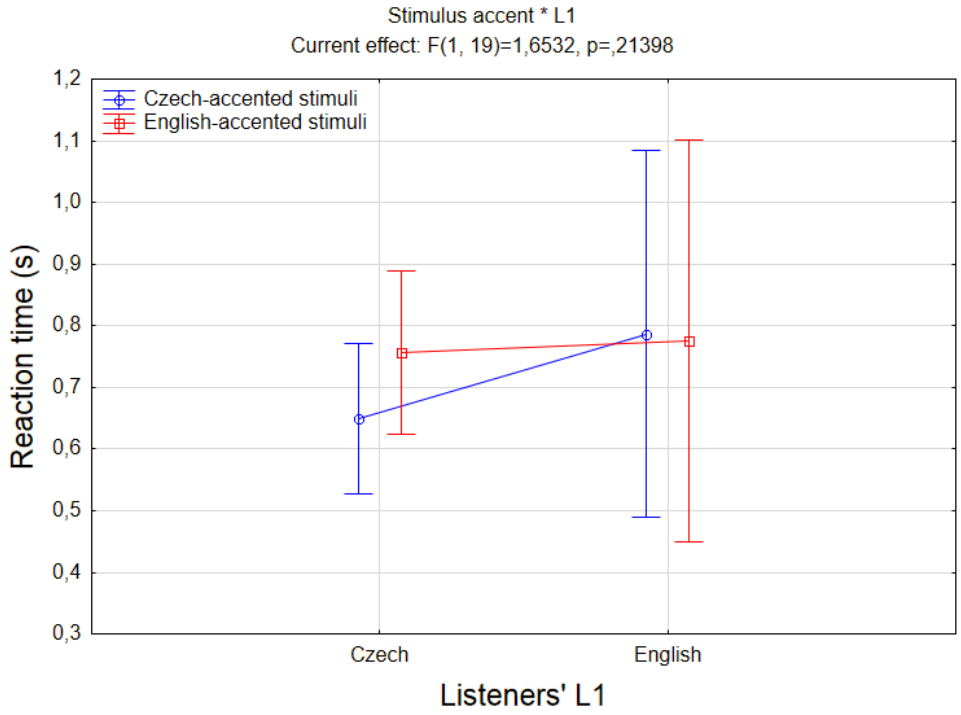


Figure 6. Reaction time ratings of Czech and American listeners to Czech- and English-accented stimuli.

Thus, the NLs and CzLs did not exhibit much difference in RTs towards Czech and English-accented stimuli. The CzLs only tended to be slightly faster when rating the Czech-accented statements than the English-accented ones.

Similarly, the comprehensibility scores were submitted to a separate repeated measures ANOVA, again with raters' native language as the between-subject factor (L1, two levels: Czech, English) and the accent of the stimulus as the within-subject factor (Accent, two levels: Czech-accented stimuli, English-accented stimuli). This time, the analysis revealed that L1 approached significance ($F[1, 19] = 3.7195$, $p = .069$). The Czech-accented stimuli were more difficult to comprehend for the listeners than English-accented stimuli (5.8 and 6.1 mean comprehensibility scores, respectively), which was a significant difference ($F [1, 19] = 6.892$, $p = .017$). As can be seen in Figure 7, there was a significant interaction between Accent and L1. Post-hoc Tukey HSD test revealed that for the English raters there was a significant

difference between Czech and English accent ($p < .001$). Also, there was a significant difference between English and Czech raters' scores that they gave to the Czech-accented stimuli ($p < .011$), the English raters' scores being significantly lower, i.e. they rated them as harder to comprehend.

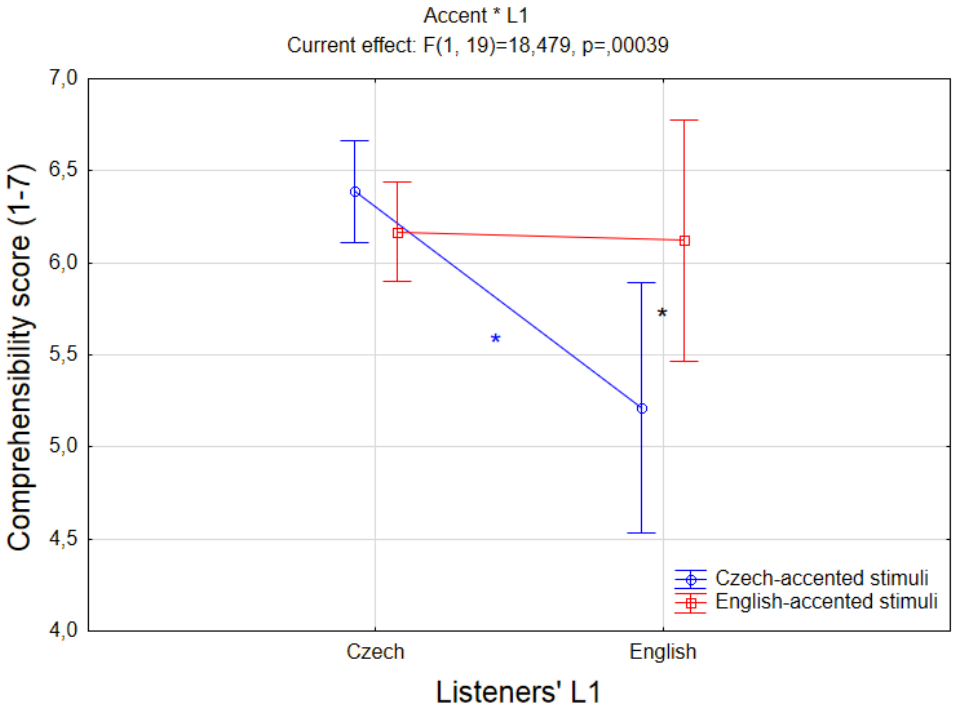


Figure 7. Comprehensibility ratings of Czech and American listeners to Czech- and English-accented stimuli. The higher the comprehensibility score, the more comprehensible the stimuli. * Post-hoc Tukey HSD test: $p < .011$; * post-hoc Tukey HSD test: $p < .001$.

Thus, the Czech-accented stimuli were comprehended significantly better and more easily by the CzLs than by the NLs. The CzLs rated the Czech- and English-accented stimuli as similarly comprehensible.

3.3. Experiment 2

Experiment 2 aims to measure the investigate credibility of Czech-accented and native-English-accented speech to CzLs, NLs, and mixed-native-language-background listeners (MLs). I hypothesize that Czech-accented utterances will be less credible for NLs than English sentences will be due to a higher processing difficulty showed in Experiment 1, but that they will be at least as credible as the English statements to CzLs due to a match in L1 and the resulting smaller processing difficulty. Further, it is expected that MLs will show a similar pattern to CzLs as a result of a mismatched interlanguage which should provide a benefit in intelligibility and comprehensibility and thus smaller processing difficulty.

3.3.1. Method

The method of this experiment is partly based on the methodology of *Experiment 1* in Lev-Ari and Keysar (2010) who tested credibility of variously-accented English speech to native American listeners.

Speakers and speech stimuli

The speakers and speech stimuli were identical to those in Experiment 1 in this paper.

Listeners

Eighteen Czech listeners (CzLs), six native American listeners (NLs) and seven listeners from various native language backgrounds (MLs) participated in the experiment. The MLs came from the following NLBs: Polish (n=2), Slovenian (n=2), Finnish (n=1), French (n=1), and Hindi (n=1). The CzLs were selected from first-year students of the English philology course at the Department of English and American Studies at Palacký University Olomouc so relatively low English proficiency was assumed. None of the CzLs and MLs had spent a longer period of time in an English-speaking country. Similarly to Experiment 1, the NLs' LOR in the Czech Republic ranged from 0 to 120 months (mean 49).

Procedure

The procedure was partly identical to that of Experiment 1 except for a few changes. The participants were also told that the statements were recorded by random people. Furthermore, they were informed that the sentences they were going to hear were not thoughts of the speakers but that the statements had been given to the speakers to be read out. In other words, the listeners were made to understand that the speakers were just reciting what they had been told. This was supposed to control for possible prejudice against NNSs that might arise due to the Czech accent, and ensure that a possible detriment in credibility would be a result of higher processing difficulty. The participants listened to the statements, each of which was preceded by a 0.5-second silence. In the Praat test on a computer, they were instructed to rate on an 18-point scale to what extent they believed the statements were true or false. One pole of the scale was labelled *definitely false* and the other *definitely true*. The test also included a *skip* button which the listeners were instructed to click only if 1) they did not understand the statement, or 2) they knew for a fact that the statement was true or false. When credibility of a statement was rated, the listeners immediately proceeded to the next sentence. In Experiment 1, there were no significant differences between the RTs of Czech and American listeners towards Czech- and English-accented stimuli. Therefore, the RTs were measured again in Experiment 2 to verify the results from Experiment 1. There was no possibility to replay the individual statements. At the end, the participants filled in the same questionnaire as in Experiment 1. The length of the listening experiment was also approximately 30 minutes.

To discover whether there is a correlation between processing difficulty (RT and comprehensibility ratings) and credibility scores of the statements, a correlation of mean RT and credibility ratings, and mean comprehensibility and credibility ratings given by Czech or American listeners to individual Czech- or English-accented stimuli was conducted.

3.3.2. Results

As in Experiment 1, the stimuli durations were subtracted from the RT judgments to acquire the true RTs to the stimuli. The mean RTs of CzLs and NLs towards the Czech- and English-accented stimuli were calculated. The mean credibility ratings for the CzLs and NLs which they gave to Czech- and English-accented stimuli were also computed. The same true-value stimulus recorded by a native American male speaker as in Experiment 1 was excluded from the analysis for the same reason. The RTs from this experiment were submitted to another repeated measures ANOVA with the between-subject variable of native language background of the listeners (L1, three levels: Czech group, English group, and mixed group of participants with various L1s) and the stimulus accent as the within subject variable (Accent, two levels: Czech- and English-accented stimuli). The analysis revealed that the effect of L1 approached significance ($F[2, 28] = 2.9$, $p = .069$) with the MLs tending to be the slowest (see Figure 8).

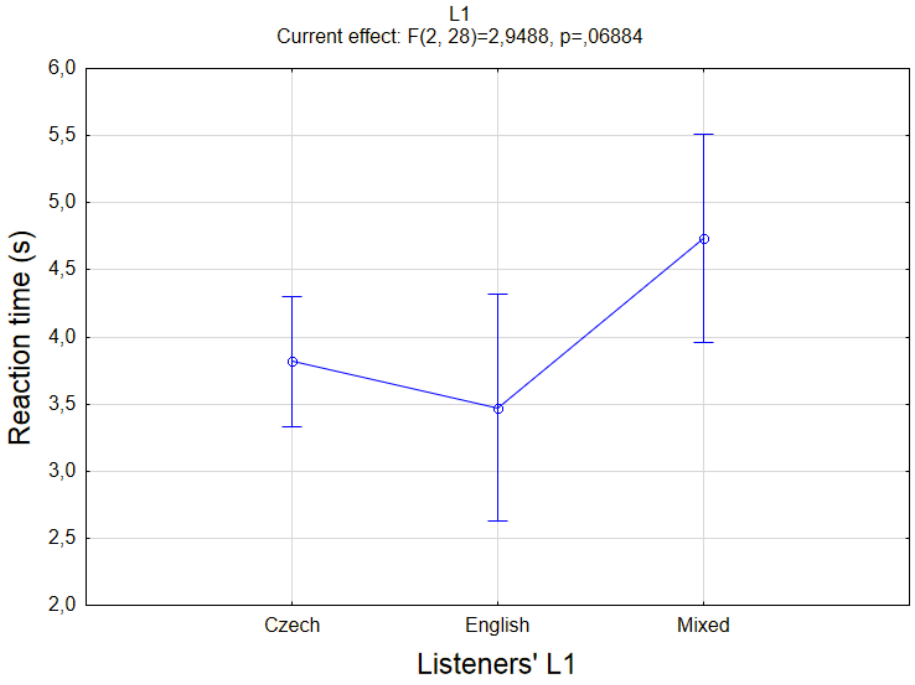


Figure 8. Reaction time ratings of Czech, American and mixed-group listeners to Czech- and English-accented stimuli.

There was a significant main effect of Accent (F[1, 28] = 5,2, p = .03): the Czech-accented stimuli took 4.2 second on average to evaluate while the English-accented stimuli took 3.8 seconds, which was a significant difference. The interaction of Accent and L1 was not significant (p > .15).

The credibility scores were submitted to a separate repeated measures ANOVA with raters' native language as the between-subject variable (L1, three levels: Czech, English, mixed) and the accent of the stimulus (Accent) as the within-subject variable. The analysis revealed that L1 had a significant main effect (F[2, 28] = 3.27, p = .053) as can be seen in Figure 9.

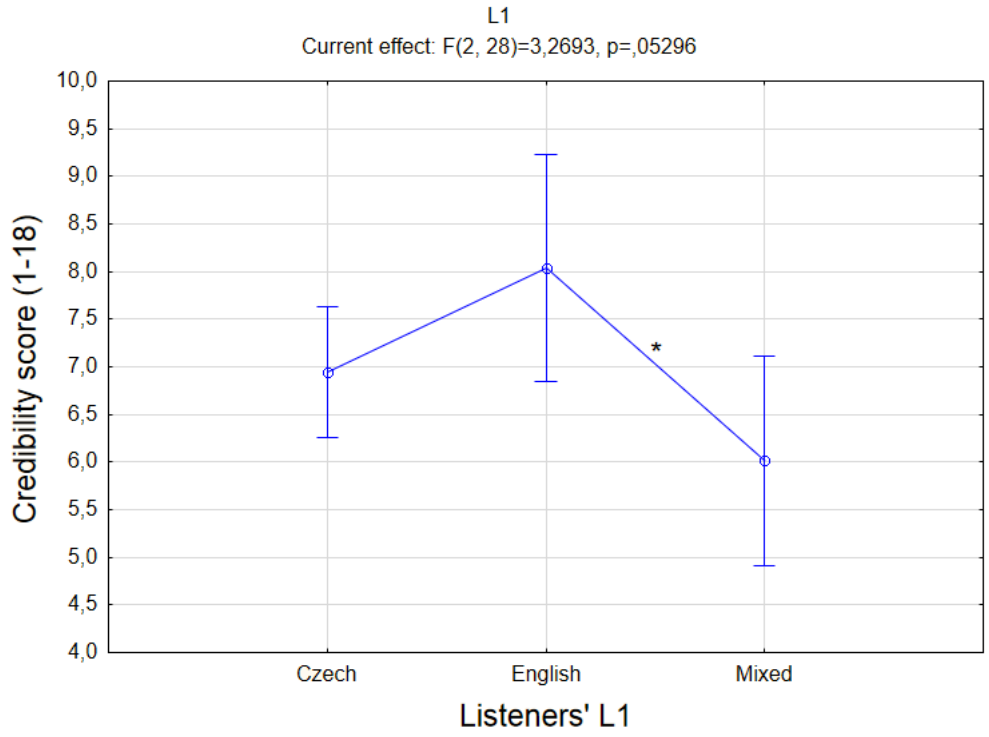


Figure 9. Credibility ratings of Czech, American and mixed-group listeners. The higher credibility score, the more credible the stimuli were. * Post-hoc Tukey HSD test: p < .05.

A post-hoc Tukey HSD test indicated that the MLs gave significantly lower credibility scores than the CzLs and NLs (p = .042). The interaction between Accent and L1 was significant as can be seen in Figure 10.

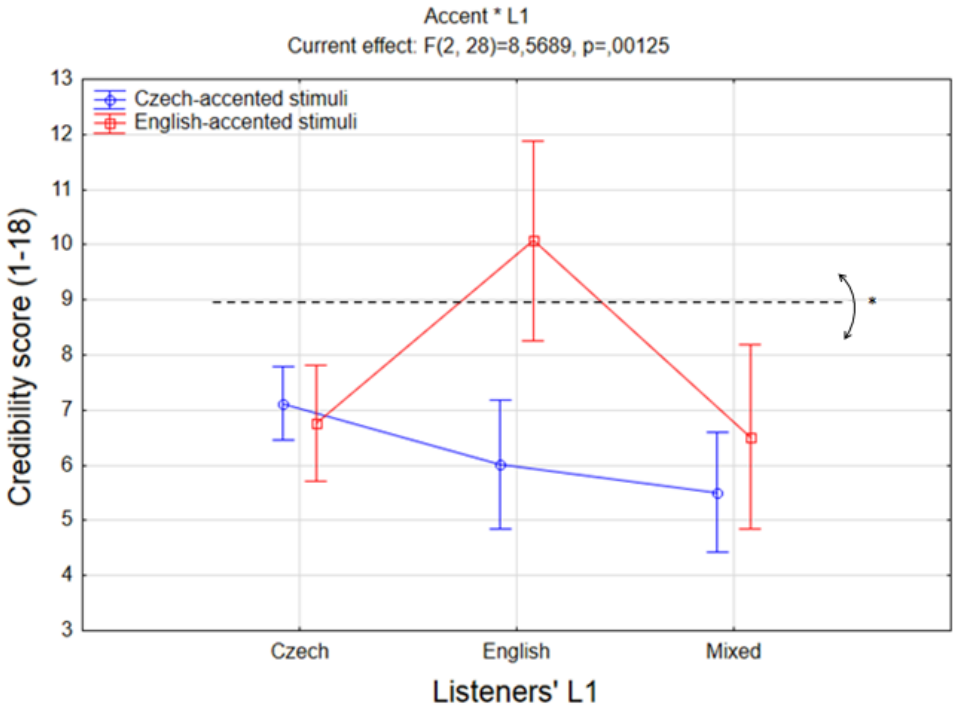
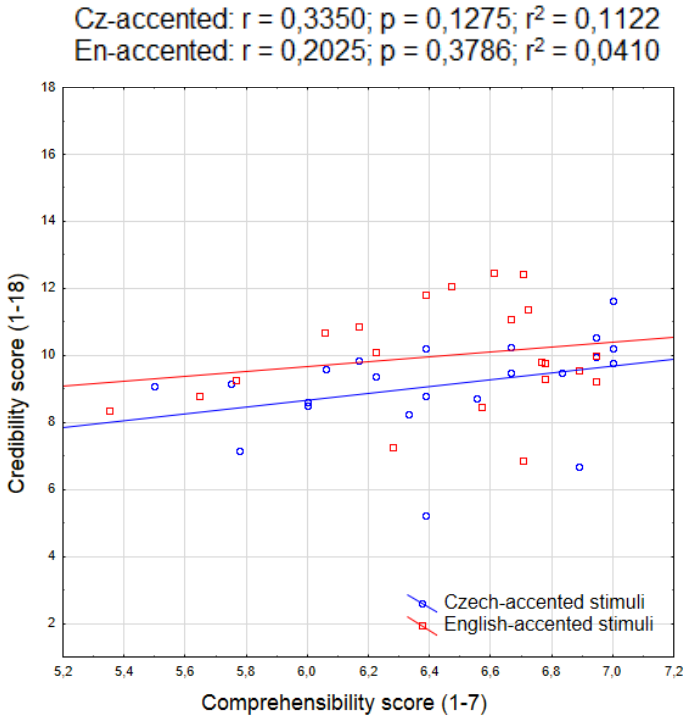


Figure 10. Credibility ratings of Czech, American and mixed-group listeners to Czech- and English-accented stimuli. The higher credibility score, the more credible the stimuli were.
* Post-hoc Tukey HSD test: $p < .05$ in all pair-wise comparisons.

A post-hoc Tukey HSD test revealed that there were significant differences in pair-wise comparisons between English listeners' ratings of English-accented stimuli and all the other scores measured ($p < .05$ in all cases).

Thus, as in Experiment 1, the RT measure did not indicate any significant differences between the listener groups, with the MLs only tending to be slower than the CzLs and NLs. As for the credibility scores, the NLs rated the English-accented stimuli significantly higher than Czech-accented stimuli and also rated it higher than the CzLs and MLs did. The CzLs rated the Czech-accented stimuli similarly to English-accented stimuli, and the MLs' credibility scores for Czech- and English-accented statements did not significantly differ either. The results of correlations made between mean RT and comprehensibility ratings, and credibility ratings given to individual Czech- and English-accented stimuli by CzLs and NLs can be seen in Figures 11 and 12.

a)



b)

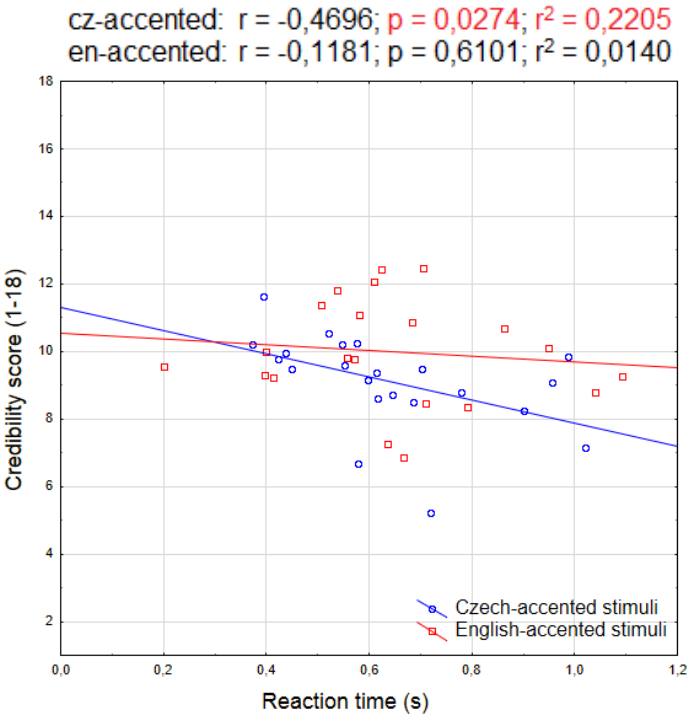
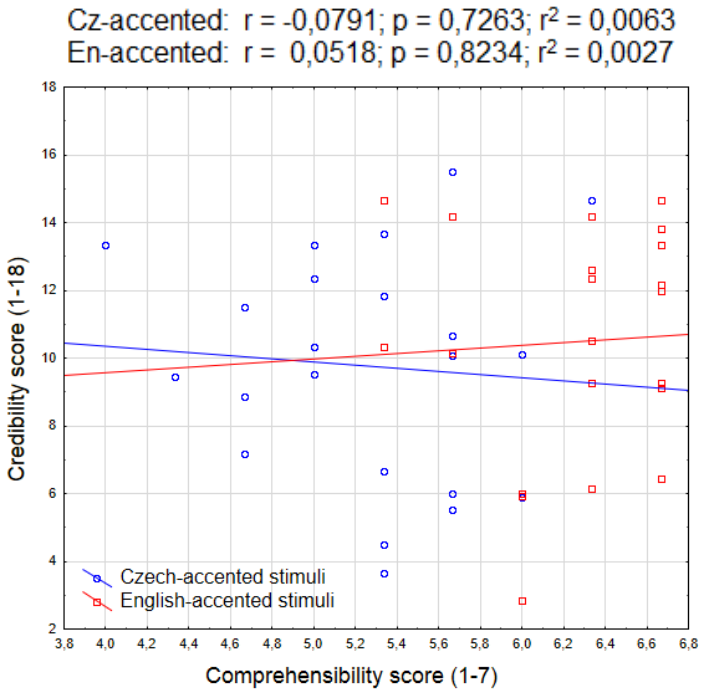


Figure 11. **a)** Correlation of mean comprehensibility and credibility scores given by Czech listeners to individual Czech- and English-accented stimuli. **b)** Correlation of mean reaction times and credibility ratings given by Czech listeners to individual Czech- and English-accented stimuli.

a)



b)

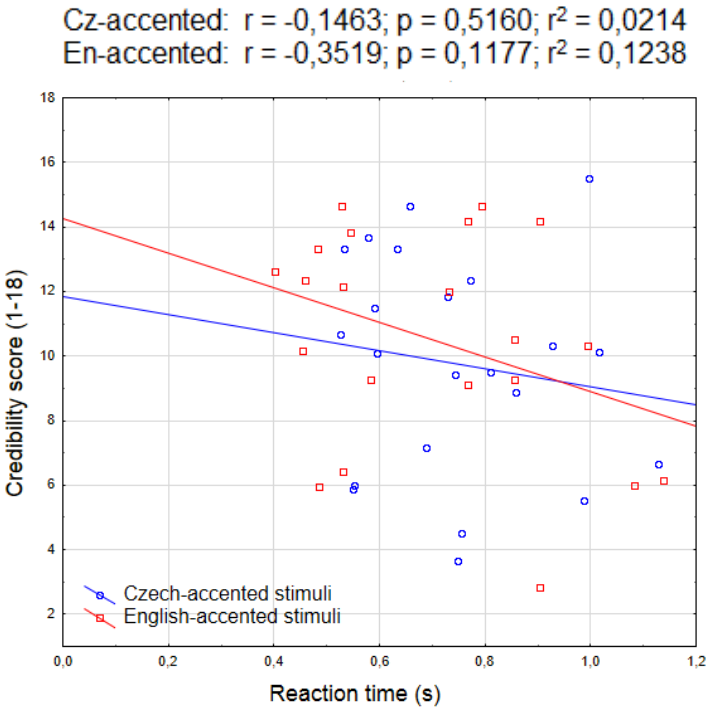


Figure 12. **a)** Correlation of mean comprehensibility and credibility scores given by American listeners to individual Czech- and English-accented stimuli. **b)** Correlation of mean reaction times and credibility ratings given by American listeners to individual Czech- and English-accented stimuli.

As can be seen, it was discovered that only RT ratings of CzLs to Czech-accented statements were negatively correlated, i.e. the more time it took to comprehend, the less credible it sounded (see Figure 11b). No other correlations were found.

3.4. Discussion

The results of Experiment 1 indicated that the RTs of CzLs and NLs towards Czech- and English-accented stimuli were not significantly different from each other. However, the comprehensibility scores showed some differences. The NLs' comprehensibility ratings for Czech-accented stimuli were significantly lower than for English-accented statements. This is in line with hypothesis 1) (see section 3.1) and also with Munro and Derwing (1995b) and Weill (2003) who also found that non-native speech is harder to process for a native English listener than native-accented speech is. Moreover, the CzLs rated the Czech-accented stimuli as similarly comprehensible as English-accented sentences, and they judged the Czech-accented stimuli as more comprehensible than NLs did. These two results confirmed hypothesis 2 and indicated a matched interlanguage comprehensibility benefit for listeners and talkers sharing the Czech NLB.

The reasons why no significant difference in RT ratings was observed between the listener groups, but differences in comprehensibility scores emerged are not clear. It can only be speculated that the inconsistency may root from the very design of the RT and comprehensibility tests. Each of the participants rated 44 statements for each of which they were supposed to press the space bar when they have comprehended the particular sentence. It is possible that the key-pressing process may have been automated in the course of the rating and the space bar pushed sooner than the utterance was actually comprehended, which would skew the results.

Similarly to Experiment 1, Experiment 2 indicated that RTs of CzLs, NLs and also MLs to Czech- and English-accented stimuli did not significantly differ. No comprehensibility judgments from the MLs were elicited so we cannot be sure if they would follow the pattern of CzLs from Experiment 1 and rated the Czech-accented

sentences higher than the English-accented ones. The MLs tended to be the slowest when reacting to the stimuli (see Figure 8) and also the least trusting (Figure 9). It can be seen that Figure 9 is a mirror image of Figure 8, i.e. the MLs might have trusted the statements less because they took them longer to process. This would imply a negative correlation between RT and comprehensibility and would be in line with Munro and Derwing (1995b). As for credibility ratings, the NLs showed significantly lower trust to Czech-accented statements than towards English-accented statements. These results replicated those of Lev-Ari and Keysar (2010) and hypothesis 3) was therefore confirmed.

Furthermore, the CzLs were confirmed to trust the Czech-accented statements to a similar extent as they trusted the English-accented stimuli. In fact, they rated the Czech-accented sentences even slightly higher. This was, however, not a significant difference. Nevertheless, we can still consider this a matched interlanguage speech credibility benefit for talkers as it is enough for the Czech listeners to trust the Czech-accented stimuli equally as the English-accented statements (see section 3.1). The CzLs also tended to believe the Czech-accented stimuli slightly more than the NLs did. Thus, the matched interlanguage speech credibility benefit was observed for talkers, and only tendentiously for listeners, so hypothesis 4) was confirmed only partly. The reason why there was not a benefit for the CzLs over the NLs in credibility of Czech-accented speech may be the NLs' familiarity with Czech accent in English or their knowledge of the Czech language since their LOR in the Czech Republic was considerable. As for hypothesis 5), the MLs tended to trust slightly more the English-accented speech than the Czech-accented stimuli, although this difference was not significant. Thus, the MLs showed a similar amount of credibility for Czech- and English-accented stimuli, which cannot be considered firm evidence for a mismatched interlanguage speech credibility benefit for talkers.

As the NLs rated the CzSs as less credible than their fellow NSs, and were also shown to judge the Czech-accented stimuli as less comprehensible than English-accented sentences, it would not be unreasonable to suppose that it was the processing difficulty rather than prejudice that reduced the credibility. This was,

however, not proven by the correlations conducted between RTs and comprehensibility ratings, and credibility judgments which were given by the CzLs and NLs to Czech- and English-accented stimuli. In order for the reduced credibility to be caused by lower comprehensibility, these two should be correlated also within each groups of listeners for either Czech- or English-accented stimuli, and not only between the two listener groups. However, a slight negative correlation was found only between the RTs and credibility scores of the CzLs rating the Czech-accented statements, i.e. the CzLs judged the CzSs as more credible as a result of higher comprehensibility indicated by lower reaction time. No other correlations were revealed so the reduced credibility of the Czech-accented stimuli for NLs seems not to be a consequence of higher processing difficulty, which is not in line with Lev-Ari and Keysar (2010). Thus, although the factor of prejudice was attempted to be ruled out in the design of the experiments, it appears to be the reason for the reduced credibility. Moreover, there is another finding which can contribute to this hypothesis. Although (Cristia et al., 2012) showed that a person of any age can adapt to a foreign accent and by that possibly lower the processing difficulty of such accented speech, the NLs participating in the experiments presented in this thesis demonstrated severe detriment to credibility when rating Czech-accented stimuli. The mean NLs' LOR in the Czech Republic at the time of testing was as many as 49 months. Therefore, they were supposed to be relatively adapted to Czech accent in English. Moreover, most of them had at least basic knowledge of the Czech language. Yet, they trusted the Czech-accented statements significantly less than English-accented ones. This implies that they must have held some subconscious prejudice against the CzSs.

3.4.1. Future directions

The methodology of the conducted experiments bears some imperfections that might be corrected in future research. Also, many more factors that are likely to influence the mutual comprehensibility and credibility of Czech and native English speakers

can be explored. To investigate those would, however, be beyond the scope of this thesis. In this section, a number of possible future directions will be suggested.

A better differentiation between the effects of prejudice against an accent and higher processing difficulty would be possible if both comprehensibility and accentedness judgments were included in the tests. If, for example, a Czech-accented statement was rated as relatively comprehensible but clearly accented, and credibility for such a statement dropped, it would be prejudice against the accent that would cause the reduction. If credibility did not drop, it would be likely that it is the processing difficulty that interferes with credibility.

Finding a way in which comprehensibility and credibility ratings could be obtained for the same stimuli by the same listeners would allow us to correlate these two measures more reliably. This could be achieved by using only one test comprising ratings of both comprehensibility and credibility, but such a design would probably be too demanding of the raters' focus and concentration.

It would also be ideal to test native English listeners who would have no experience with Czech-accented English and no knowledge of Czech, and observe if the detriment in credibility towards Czech speakers would further increase. In fact, the effect of native English listeners' various degrees of Czech-accent experience and Czech language knowledge on credibility ratings of Czech-accented speech would be worth testing.

Similarly, the effect of Czech-accent experience of *Czech* listeners on the degree of the interlanguage benefit could be investigated. Testing of Czech listeners with minimal Czech-accent experience as opposed to those with a lot of experience would allow us to distinguish whether the interlanguage benefit arises due to the shared phonological knowledge of the Czech language or due to experience with Czech-accented speech.

4. CONCLUSION

Almost anybody who is not a native speaker of English speaks the language with a detectable degree of foreign accent. This is considered to be the result of reduced neural plasticity that starts to come with an age around puberty, so the age of second language learning is a crucial factor for native-like pronunciation acquisition (Flege, 1995). The mechanism behind the inaccurate perception and production of second language sounds is supposed to be the concept of language transfer (Piske et al., 2001), i.e. the ever-present influence of one's first language on the second one. Other factors than the age of learning that can affect the degree of a foreign accent in speech are for example the learner's length of residence in the country where the second language is predominantly spoken, and the amount of first and second language use (Piske et al., 2001).

As a good deal of research showed, foreign-accentedness can have a negative impact on how the speech and speaker are perceived by native listeners. Along with visual dimensions, language plays a crucial role in listeners' judgments. As opposed to native speakers of a language, non-standard-accented speakers (regional- or foreign-accented) are approached in a different way by native listeners. Above all, a non-standard accent may entail judgments of reduced competence and credibility of the speaker (Rakic et al., 2011; Dixon, 2002; Hosoda et al., 2012; Tsalikis, 1991). Such a negative attitude towards non-standard-accented speakers may be caused by two factors: 1) negative stereotypes triggered by the accent which consequently lead to conscious or subconscious prejudice, and 2) higher processing difficulty as a result of lower intelligibility of the accented speech for native listeners (Lev-Ari and Keysar, 2010).

However, when two non-native interlocutors come into communicative contact, their foreign-accentedness does not have to be detrimental. In fact, their mutual intelligibility may be higher than if one of the non-native speakers was engaged in

communication with a native speaker (van Wijngaarden, 2001, 2002; Bent and Bradlow, 2003; Hayes-Harb et al., 2008). This intelligibility benefit holds especially when the non-native speakers share the native language background (the matched interlanguage speech intelligibility benefit [MISIB]), but may also extend to situations in which two non-native speakers come from different native language backgrounds (the mismatched interlanguage speech intelligibility benefit [MMISIB]). As a result of unimpaired mutual intelligibility of two non-native speakers, the processing difficulty should stay low. Moreover, non-native speakers from the same native language and cultural background are not likely to hold any prejudice against each other. For these reasons, their mutual credibility should also remain unimpaired, a phenomenon which might be called the interlanguage speech *credibility* benefit.

The interlanguage speech intelligibility benefit (ISIB) is divided into two subcategories: a benefit for talkers and for listeners. The former refers to a situation in which non-native listeners understand non-native speakers at least as well as they understand native speakers, i.e. comparing two categories of *talkers*, hence the name of the subcategory (ISIB-*T*). The latter indicates a case in which a non-native listener rates the intelligibility of a non-native speaker higher than a native listener does, i.e. comparing two categories of *listeners* (ISIB-*L*) (Hayes-Harb, 2008).

Nevertheless, the ISIB phenomenon is of a complex character and does not have to be pervasive. That is to say, the benefit emerges only under specific conditions. Furthermore, each subtype of the benefit has to be considered separately. While the research indicates that the MISIB emerges relatively often, given that certain conditions have been met (van Wijngaarden, 2001; Bent and Bradlow, 2003; Hayes-Harb et al., 2008), the MMISIB seems to be much less stable (Hongyan and Heuven, 2007). Perhaps the most potent factor affecting the emergence of the ISIB proved to be the English proficiency of the non-native speakers as well as the listeners involved. As for the ISIB-T, the advantage in intelligibility was discovered only for high-proficiency talkers (Bent and Bradlow, 2003; Xie et al., 2013; van Wijngaarden, 2002) and predominantly low-proficiency listeners (Pinet et al., 2010; Xie et al.,

2013). As far as the ISIB-L is concerned, the emergence of the advantage for low-proficiency speakers (Hayes-Harb, 2008) as well as high-proficiency ones was discovered (Song, 2011). Both of these works demonstrated the benefit for low-proficiency listeners. Thus, most of the evidence indicates that the ISIB is most likely to be observed when a high-proficiency talker and a low-proficiency listener pair is in question. Other factors that may influence the emergence of the ISIB are for example the listeners' experience with the particular accent they are perceiving in the non-native speech (Baese-Berk, 2013), or the genealogic difference between the first and second languages (Hongyan and Heuven (2005). There is also some research that disproved the ISIB hypothesis (Major et al., 2002; Smith et al., 2009; Munro et al., 2006; Stibbard and Lee, 2006). These works must have encountered or created specific conditions that caused the non-emergence of the ISIB phenomenon by, for example, neglecting one of the important factors influencing the ISIB, e.g. the factor of talker-listener proficiency.

Two works served as a basis for the perceptual experiments presented in this thesis: 1) "The interlanguage speech intelligibility benefit" by Bent and Bradlow (2003) (along with the follow-up research in the ISIB) who demonstrated the (M)MISIB-T, and 2) "Why Don't We Believe Non-native Speakers? The Influence Of Accent On Credibility" by Lev-Ari and Keysar (2010) who discovered that non-native speakers of English sound less credible to native American listeners than American speakers do. Based on these findings, it was hypothesized that native American listeners would find Czech speakers of English as less comprehensible and credible than native American speakers. It was also expected that Czech-accented speakers would be at least equally comprehensible and credible as native American speakers to Czech listeners, and that the Czech speakers would be more comprehensible and credible to Czech listeners than to native American listeners. Further, it was hypothesized that Czech speakers would be at least as credible as native English speakers to non-native listeners from various native language backgrounds. This credibility benefit was assumed to be the consequence of unimpaired processing fluency resulting from unreduced mutual intelligibility of non-native speakers.

The results confirmed most of the hypotheses. It was shown that both comprehensibility and credibility of Czech-accented speech was much lower for native American listeners than credibility of English-accented stimuli was. The finding about the credibility reduction for American listeners replicated the results of Lev-Ari and Keysar (2010). The Czech listeners tended to give comparable comprehensibility and credibility ratings to Czech-accented stimuli and English-accented statements, giving rise to a matched interlanguage speech comprehensibility/credibility benefit for talkers. However, the Czech listeners did not demonstrate any significant advantage over American listeners in their trust towards Czech-accented sentences, so no matched interlanguage speech credibility benefit for listeners was observed. Nevertheless, the Czech listeners rated the Czech speakers as more comprehensible than the American listeners did. The listeners from various native language backgrounds tended to trust slightly more the English-accented speech than the Czech-accented stimuli. However, this difference was not significant and the finding cannot be considered firm evidence for a mismatched interlanguage speech credibility benefit for talkers.

Contrary to expectations, when the interaction of credibility and comprehensibility was examined, it was discovered that the two dimensions were not correlated. This suggests that the reduced credibility is not a consequence of increased processing difficulty, but rather a result of subconscious prejudice that the American listeners seemed to hold against the Czech-accented speakers.

This research sheds some light on how Czech speakers of English may be perceived in various communicative situations with native English speakers and non-native speakers around the globe. While the Czech speakers do not have to be concerned about their credibility when communicating with their fellow Czech speakers of English, the reduced credibility they can experience with native English listeners could be very disadvantageous in various social, as well as professional contexts. The research in the negative impacts of foreign-accentedness therefore implies that it is not only intelligibility of speech that should be focused on, but that also foreign-accentedness reduction would be advisable to pursue in second language teaching.

5. RESUMÉ

V dnešní době, kdy se angličtina stala hlavním jazykem pro obchodní a politická jednání, a také pro komunikaci v dalších kontextech po celém světě, je důležité, aby si jednotliví mluvčí mezi sebou bez problémů rozuměli, a to i když pocházejí z různých koutů světa a nejsou rodilými mluvčími angličtiny.

Téměř u každého, kdo není rodilým mluvčím angličtiny, může být v řeči detekována určitá míra cizího přízvuku. Za příčinu cizího akcentu v řeči je často považována snižující se plasticita mozku, proces, který začíná zhruba v období puberty. Věk tedy hraje velice důležitou roli při osvojování si druhého jazyka (Flege, 1995).[16] Za mechanismus, který stojí za nepřesnou percepcí a produkcí hlásek druhého jazyka, je považován transfer mezi oběma jazyky (Piske a kol., 2001), tj. neustálý vliv prvního jazyka na jazyk druhý. Jinými faktory kromě věku osvojení, které ovlivňují míru cizího akcentu v řeči, jsou například délka pobytu v zemi, kde se daným jazykem převážně mluví, nebo míra používání prvního a druhého jazyka (Piske a kol., 2001).

Jak se mnoha výzkumům podařilo dokázat, cizí akcent v řeči může mít negativní dopad na to, jak jsou řeč a sami mluvčí vnímáni rodilými mluvčími. Kromě vizuálních vjemů hraje v úsudcích posluchačů stěžejní roli právě jazyk. Postoj rodilých posluchačů k mluvčím s nestandardním akcentem je jiný než jejich postoj k mluvčím rodilým. Nestandardní přízvuk může především zapříčinit sníženou důvěryhodnost a kompetenci onoho mluvčího (Rakic a kol., 2011; Dixon, 2002; Hosoda a kol., 2012; Tsalikis, 1991). Takto negativní postoj může být zaujat ze dvou důvodů: 1) akcent aktivuje negativní stereotypy, které vedou k vědomé nebo podvědomé předpojatosti, nebo 2) horší porozumění a s tím spojená vyšší náročnost na zpracování akcentovaného signálu pro rodilé posluchače (Lev-Ari a Keysar, 2010).

[16] Veškerá literatura zmíněná v této sekci je psána v angličtině.

Když ale do komunikačního kontaktu přijdou dva nerodilí mluvčí, jejich cizí akcent v řeči nemusí mít negativní důsledky. Ve skutečnosti může být jejich vzájemné porozumění vyšší, než kdyby jeden z nich komunikoval s rodilým mluvčím (van Wijngaarden, 2001, 2002; Bent a Bradlow, 2003; Hayes-Harb a kol., 2008). Této výhodě v porozumění se v anglické literatuře říká „interlanguage speech intelligibility benefit" (zkráceně ISIB),[17] tedy výhoda v porozumění řeči na základě sdíleného či nesdíleného rodného jazyka. Ona výhoda platí obzvláště v případech, kdy jsou oba mluvčí stejného jazykového původu, ale může se projevit i když oni mluvčí jazykové zázemí nesdílejí. V důsledku nesnížené srozumitelnosti mezi těmito nerodilými mluvčími by náročnost zpracování signálu měla zůstat nízká. Kromě toho není důvod předpokládat, že by k sobě mluvčí ze stejného jazykového a celkově kulturního zázemí chovali jakékoli předsudky. Z těchto důvodů by i jejich vzájemná důvěryhodnost měla zůstat nedotčena.

ISIB byl rozdělen na dvě podkategorie: výhoda v porozumění pro mluvčí a pro posluchače. První zmíněné se týká situace, kdy nerodilý posluchač rozumí nerodilému mluvčímu alespoň stejně dobře jako rodilému mluvčímu, tzn. porovnávány jsou dvě kategorie mluvčích, proto výhoda pro mluvčího (anglická zkratka ISIB-T). Druhé zmíněné označuje případ, ve kterém nerodilý posluchač hodnotí srozumitelnost nerodilého mluvčího výše než rodilý posluchač, tzn. porovnávány jsou dvě kategorie posluchačů, proto výhoda pro posluchače (ISIB-L) (Hayes-Harb, 2008).

ISIB je nicméně jev velice komplexní a nemusí být v kontextu nerodilých mluvčích všudypřítomný. Jinými slovy, ISIB se objevuje pouze za určitých podmínek a okolností, a také se musí na každou podkategorii nahlížet zvlášť. Zatímco výzkumy ukazují, že za předpokladu, že byly splněny určité podmínky, ISIB pro posluchače a mluvčí stejného jazykového původu je relativně častý (van Wijngaarden, 2001;

[17] Po lepši srozumitelnost bude anglická zkratka ISIB v této kapitole používána i nadále místo celého českého překladu onoho jevu.

Bent a Bradlow, 2003; Hayes-Harb a kol., 2008), ISIB pro posluchače a mluvčí lišícího se jazykového zázemí je mnohem méně stabilní (Hongyan a Heuven, 2007). Pravděpodobně nejsilnějším faktorem, který ovlivňuje, zda se výhoda v porozumění objeví, je míra pokročilosti v angličtině jak mluvčích, tak posluchačů. Co se týče jevu ISIB-T, výhoda v porozumění byla prokázána pouze pro mluvčí s velkou pokročilostí (Bent a Bradlow, 2003; Xie a kol., 2013; van Wijngaarden, 2002) a posluchače s nízkou pokročilostí v angličtině (Pinet a kol., 2010; Xie a kol., 2013). Pro ISIB-L byla výhoda nalezena pro mluvčí s nízkou (Hayes-Harb, 2008) i vysokou (Song, 2011) pokročilostí. Oba tyto zmíněné výzkumy objevily výhodu pro posluchače nízké pokročilosti v angličtině. Většina výzkumů tedy dokazuje, že ISIB se s největší pravděpodobností projeví v komunikační situaci relativně vysoce pokročilého mluvčího a relativně málo pokročilého posluchače. Dalšími faktory, které mohou ovlivnit, zda se ISIB projeví, jsou například posluchačova zkušenost s daným akcentem (Baese-Berk, 2013) nebo genealogický rozdíl mezi prvním a druhým jazykem (Hongyan a Heuven, 2005). Objevují se také studie, které ISIB nepozorovaly a staví se tak proti této hypotéze (Major a kol., 2002; Smith a kol., 2009; Munro a kol., 2006; Stibbard a Lee, 2006). Tyto práce tedy musely vytvořit takové podmínky, za kterých jev nemohl být pozorován, např. pominuly faktor pokročilosti mluvčích a posluchačů v angličtině.

Dva výzkumy posloužily jako základní kámen pro percepční experimenty, které jsou provedeny jako součást této práce: 1) „The interlanguage speech intelligibility benefit“, Bent a Bradlow (2003) (a práce z nich vycházející), kteří objevili ISIB-T pro stejné i rozdílné jazykové zázemí posluchačů, a 2) „Why Don't We Believe Non-native Speakers? The Influence Of Accent On Credibility“, Lev-Ari a Keysar (2010), kteří vyzkoumali, že nerodilí mluvčí angličtiny znějí rodilým americkým posluchačům méně důvěryhodně než rodilí američtí mluvčí. Na základě těchto zjištění byla vytvořena hypotéza, která říká, že rodilí američtí posluchači budou hodnotit české mluvčí angličtiny jako méně srozumitelné a důvěryhodné než rodilé americké mluvčí. Další hypotéza praví, že čeští mluvčí angličtiny budou pro české posluchače alespoň stejně srozumitelní a důvěryhodní jako rodilí američtí mluvčí,

a že čeští mluvčí budou srozumitelnější a důvěryhodnější pro české posluchače než pro americké. Čeští mluvčí také měli být alespoň stejně srozumitelní a důvěryhodní jako rodilí američtí mluvčí pro nerodilé posluchače pocházející z různých jazykových zázemí. Předpokládalo se, že tato výhoda v porozumění a důvěryhodnosti bude pramenit z nezvýšené obtížnosti zpracování signálu jakožto důsledku nesnížené vzájemné srozumitelnosti nerodilých mluvčích.

Výsledky experimentů potvrdily většinu hypotéz a ukázaly, že srozumitelnost i důvěryhodnost česky akcentovaných promluv byly pro americké posluchače opravdu nižší než srozumitelnost a důvěryhodnost rodilé řeči. Čeští posluchači hodnotili česky akcentované promluvy jako podobně srozumitelné a důvěryhodné jako rodilou anglickou řeč. Neprokázali ale žádnou výraznou výhodu nad americkými posluchači v důvěře k česky akcentovaným tvrzením. Nerodilí posluchači různého jazykového původu ale hodnotili česky akcentované promluvy jako podobně důvěryhodné jako tvrzení pronesené rodilou anglickou řečí.

Oproti očekávání se nicméně nepotvrdilo, že by srozumitelnost a důvěryhodnost korelovaly. Toto zjištění naznačuje, že snížená důvěryhodnost není důsledkem zvýšené obtížnosti zpracování signálu, ale spíše výsledkem podvědomé předpojatosti rodilých amerických posluchačů vůči česky akcentovaným mluvčím.

Výsledky výzkumu této práce naznačují, jak můžou být čeští mluvčí angličtiny vnímáni v různých komunikačních situacích jak s rodilými mluvčími, tak nerodilými mluvčími angličtiny po celém světě. Zatímco si čeští mluvčí nemusí dělat starosti se svou důvěryhodností v angličtině, pokud komunikují s dalšími českými mluvčími, snížená důvěryhodnost, kterou mohou pocítit při komunikaci s rodilými mluvčími, může být velmi znevýhodňující v různých sociálních, ale také pracovních kontextech. Výzkum, který se zabývá negativními dopady cizího akcentu v řeči tak naznačuje, že výuka cizího jazyka by se měla zaměřit nejen na srozumitelnost řeči, ale také na redukci cizího přízvuku.

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