# CREDIBILITY OF NATIVE AND NON-NATIVE SPEAKERS OF ENGLISH REVISITED: DO NON-NATIVE LISTENERS FEEL THE SAME?

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**Abstract**
This study reports on research stimulated by Lev-Ari and Keysar (2010) who showed that native listeners find statements delivered by foreign-accented speakers to be less true than those read by native speakers. Our objective was to replicate the study with non-native listeners to see whether this effect is also relevant in international communication contexts. The same set of statements from the original study was recorded by 6 native and 6 non-native speakers of English. 121 non-native listeners rated the truthfulness of the statements on a 7-point scale. The results of our study tentatively do confirm a negative bias against non-native speakers as perceived by non-native listeners, showing that subconscious attitudes to language varieties are also relevant in communication among non-native speakers.

**Keywords**: credibility, foreign accent, language attitudes, speech communication, speech perception

## 1. Introduction

The rapid globalization of recent years has led to an increased interest in studying non-native accents. There have been numerous studies reporting particularly on the role of foreign accent in speech perception. Most of the research has been concerned with attitudes that native speakers have towards foreign accents; however, English is quickly becoming the most important means of communication in the international context where its native speakers are not always present. Indeed, as Crystal (1997) states, there are more people who speak English as a foreign language than there are people whose native language is English. This has led some researchers to believe that it is no longer necessary to attempt to attain native-like pronunciation, as people who started learning English later are unlikely to ever achieve a native-like pronunciation, and instead learners should focus on mutual intelligibility (see Szpyra-Kozłowska, 2015: chapter A.1.4

for review). Jenkins (2011) goes as far as to suggest that native like pronunciation may actually hinder communication between non-native speakers. She suggests that non-native speakers should focus on the areas of pronunciation which are essential for intelligibility and she proposes a set of Lingua Franca Core (LFC) features, which should ensure intelligibility and at the same time allow the speakers to express their identity through their foreign accent (Jenkins, 1998). However, the relevance of the LFC features for intelligibility has been undermined, for example by Christiansen (2014) who showed in his empirical study that the "core" features were the least important for intelligibility. The LFC is thus not universally accepted, and other researchers propose that teaching English based on native models still is a necessary part of teaching English as a foreign language (see, e.g., Szpyra-Kozłowska, 2015 and her concept of Native English as a Lingua Franca, NELF).

In order to better understand various aspects of foreign language communication, it is important to explore not only the issues of mutual intelligibility in international contexts, but also the attitudes that speakers have towards different accents of English. It is a generally acknowledged fact in sociolinguistics (described for instance in Munro, Derwing & Sato, 2006; Edwards, 1999; Gluszek & Dovidio, 2010) that non-native speakers are commonly perceived as inferior, compared to native speakers, on various dimensions of *status*, such as intelligence, ambition or competence. While native non-standard accents are rated equally negatively on traits reflecting status, such as foreign accents (even by speakers who themselves speak with a non-standard accent, see Cargile & Giles, 1998), they tend to be evaluated better in terms of *solidarity* (i.e., traits like friendliness, likeability, sincerity) compared to non-native accents (e.g. Trudgill, 1983; Beinhoff, 2013). It is important to realize that these attitudes are not simply a matter of intolerance or discrimination: studies have shown that people are often not aware of these judgements and, more specifically, that we hold both explicit and implicit attitudes towards one person of group of people, and these may not be identical (e.g., Munro et al., 2006; Pantos & Perkins, 2013).

Such attitudes of native listeners towards non-native accents, whether conscious or not, may result in various instances of discrimination of non-native speakers. Purnell, Idsardi & Baugh (1999), for example, reported on housing discrimination of people with non-native accents in the USA. Baugh, one of the researchers and a tridialectal speaker (Standard American English, African-American Vernacular, and Latino accent), conducted telephone interviews with property owners from different San Francisco localities who were advertising in regional newspapers. He called each of the property owners on three occasions, speaking in a different dialect every time. The results of the experiment revealed a clear pattern of discrimination associated with the three dialects by geographical area: the strongest bias against non-native dialects was documented in the traditionally white areas like Woodside or Palo Alto.

Another study addressing discrimination against foreign-accented speakers was conducted by Kalin and Rayko (1978) who investigated the effects of the speakers' ethnicity on judgements of suitability for a job. The participants in their study, who were English-Canadian speakers, acted as personnel consultants and evaluated ten job applicants (five with a Canadian accent, five with a foreign accent) for four jobs varying in social status. Results from their study showed discrimination against the foreign-accented applicants, who were evaluated as less suitable for the higher status jobs but more suitable for the lower status jobs, as compared with the English-Canadian accented speakers.

The selective survey of research presented by Kalin and Rayko (1978) shows that a foreign accent plays an important role in communication – not only may it hinder mutual intelligibility, but it has also been shown to influence listeners' attitudes towards non-native speakers and may lead to discrimination. We consider it important to investigate what kind of judgements (e.g., intelligence, friendliness, reliability etc.) listeners make about speakers based only on their speech in order to raise awareness of the issue on the part of both speakers and listeners. Eventually, the results of such informed research may lead to more effective communication in English as an international language.

The present study will investigate listeners' judgements about the credibility of non-native speakers and it will extend the study of Lev-Ari and Keysar (2010), who investigated the influence of non-native accent on credibility, as perceived by native listeners of English. They assumed that the fact that non-native accents are more difficult to process (e.g. in Munro & Derwing, 1995) may cause non-native speakers to sound less credible.

Lev-Ari and Keysar (2010) performed two experiments in which they used three types of accent, each represented by three different speakers: native, mild non-native (Polish, Turkish, and German), and heavy non-native (Korean, Turkish, and Italian). The level of accent was classified according to the judgement of four native speakers of English. Each speaker recorded a set of 45 trivia statements whose truth value was not easy to determine such as *A giraffe can go without water longer than a camel can*. Half of the statements were true and half were false. The test consisted of 15 statements by the native speakers, 15 statements by the non-native speakers with a mild accent, 15 by the non-native speakers with a heavy accent, and 15 filler statements read by an additional two native speakers.

Thirty native listeners of American English participated in the first experiment. The experiment was ostensibly about intuition in knowledge assessment and the participants were told that the speakers were only reading what the experimenter wrote and did not know themselves whether the statements they were reading were true or not. To support the claim that the speakers were only messengers, the participants themselves recorded five trivia statements, supposedly for future participants. After recording the statements, they listened to the set of sixty statements preceded by two example sentences, and indicated the veracity of each statement on a 14 cm line with one pole labelled *definitely true* and the other

*definitely false*. The participants also indicated whether they knew for a fact that the statement was true or not, and they were also asked to indicate if they could not understand what the speaker said.

Listeners' truth judgements were analyzed using a mixed model. The results of the experiment showed that accented speech was rated as significantly less truthful than native speech. Statements with mild and heavy accent did not differ from each other. Because the statements read by non-native speakers were perceived as less truthful even when it was stressed that they were only delivering information from the experimenter, Lev-Ari and Keysar (2010) concluded that the listeners misattributed the difficulty of processing speech to the truthfulness of the statements.

The second experiment tested whether awareness of processing difficulty influenced listeners' judgements of truth value. The stimuli were identical to those used in the first experiment. Instead of focusing on the presentation by the speaker, the participants in Experiment 2 were told that 'the experiment was about the effect of the difficulty of understanding speakers' speech on the likelihood that their statements would be believed' (Lev-Ari & Keysar, 2010: 1095). Twenty-seven native listeners of English who had not taken part in Experiment 1 listened to the stimuli and again rated the veracity of each statement on a 14 cm line. In Experiment 2, the results showed that only the heavily accented speech was perceived as significantly less truthful, while truth ratings did not differ between mild and native accents. Lev-Ari and Keysar (2010) suggest that the participants attempted to counteract the impact of processing difficulty, but were only successful for mildly accented speech. Indeed, reduced cognitive ease has been associated with lower credibility ratings (Oppenheimer, 2008).

Lev-Ari and Keysar (2010) conclude that native listeners perceive statements as less truthful when spoken by non-native speakers, even when the speakers were only delivering a message from a native speaker. The awareness of the role of processing difficulty in assessing truth value positively influenced the credibility of mildly accented speakers; however, listeners were not able to compensate for the difficulty associated with heavy-accented speech. The authors suggest that the results have important implications for non-native speakers because their accent might reduce their credibility as job seekers, eyewitnesses, or reporters.

Because of the far-reaching implications of these results, Lev-Ari and Keysar's study (2010) inspired further research into the role of foreign accent in credibility. De Meo, Vitale, Pettorino and Martin (2011) investigated the relationship between credibility and foreign accent in the Italian context, with Chinese speakers of Italian. Apart from foreign accent, they also examined other segmental and suprasegmental acoustic features, such as silent pauses duration, speech rate, or fluency, and correlated them with credibility ratings. Contrary to Lev-Ari and Keysar's research (2010), the results in the study by De Meo et al. (2011) did not confirm a correlation between foreign accent and credibility, but rather they revealed that suprasegmental features of an utterance (tonal range, duration of

silences) are more important for the perceived veracity of a statement than the strength of foreign accent itself.

Souza and Markman (2013) also attempted to replicate the findings of Lev-Ari and Keysar (2010). They were interested in investigating whether it is processing difficulty that influences judgments of truth, as argued by Lev-Ari and Keysar (2010). They mixed the recorded statements with white noise at different Signal-to-Noise Ratios, or with speech babble noise. However, neither the white noise, nor the speech babble noise had any influence on the evaluated credibility, which led the authors to the conclusion that processing difficulty – such as that associated with more adverse listening conditions – does not influence the judgements of truthfulness. In the second part of their study, Souza and Markman (2013) attempted to replicate Lev-Ari and Keysar's (2010) findings using foreign-accented speech. However, the results of the second experiment did not affect credibility ratings either.

These studies thus failed to replicate the findings reported by Lev-Ari and Keysar (2010); however, the methodology they used was different and their results are not directly comparable. On the other hand, Stocker (2016), who also attempted to replicate the findings of Lev-Ari and Keysar (2010) in the Swiss context, used the same set of trivia statements as in the original study (translated into Swiss-German and French) and used a similar setting of the experiment. Instead of differentiating between degrees of accentedness, Stocker (2016) used different types of accents (Italian, English, Swiss-German, and French) and added an attitude task at the end of the test. The respondents in her study were French and Swiss-German, and they rated a set of native and accented statements in their L1. The subsequent analysis of statement ratings did not indicate any influence of foreign accent on credibility, and the response patterns did not differ systematically between the French and Swiss-German accent. Concerning the attitude measurement task following the credibility ratings, the data revealed an in-group preference, with French speaking participants attributing adjectives relating to credibility mostly to the French accent, and Swiss-German speaking participants preferring the Swiss-German accent. The English accent occupied second place among both French and Swiss-German respondents. Stocker (2016) concludes that while there do seem to exist stereotypes in terms of credibility about the different language groups she investigated, the credibility judgements did not differ significantly across accent conditions (neither in the French survey, nor in the German survey).

All of the previously mentioned studies investigating credibility ratings were only interested in how native listeners of a particular language evaluate native and foreign-accented speakers. However, as suggested earlier in this article, in today's globalized world there are many situations where only non-native speakers are present and communicate with each other. The present study therefore aims to investigate the influence of foreign accent on credibility as perceived by non-native speakers of English, using as similar a methodology to the study by Lev-Ari and Keysar (2010) as possible. We use essentially the same set of trivia

statements as Lev-Ari and Keysar (2010), recorded by native speakers of British English and native speakers of American English (to represent the major standard dialects of English), Czech speakers of English, and other non-native speakers of English (see below). Such a selection also allows us to examine whether there are any differences in perceived credibility between these four groups of speakers.

In particular, this study attempts to answer the following research questions:

1. Does foreign accent have a negative effect on credibility as perceived by non-native listeners?
2. Is there any difference in perceived credibility between the four speaker groups?
3. Is there any difference in perceived credibility between the two groups of native speakers (British and American), or do they behave as a group?
4. Do Czech listeners exhibit a bias, positive or negative, for Czech-accented English as compared to other non-native accents?

## 2. Method

### 2.1. Speech material

In order for the present study to be comparable with the original study of Lev-Ari and Keysar (2010), the same set of trivia statements was used[1], including the true statements, the false statements, the fillers and the two examples. However, slight modifications had to be made because the participants in our research – speakers, as well as listeners – are non-native speakers of English, who could have problems with pronouncing or understanding some particular items of vocabulary. In order to identify the difficult items, the list of statements was given to three Czech speakers of English (B level, based on the Common European Framework of Reference for Languages, 2001) who marked the items or constructions they did not understand or did not know how to pronounce. Subsequently, the problematic vocabulary items were either replaced by another item from the same semantic field (e.g., *falcon* was replaced by *eagle*), or in five cases the whole sentence was replaced by another with the same truth value. All imperial units were converted into the metric system (e.g. *gallons* to *litres*), so that non-native speakers of English could understand the measurements. After the changes were made, the same three non-native speakers reported that they had no problem understanding the statements. The final list of statements consisted of 60 statements, half of which were true and half false, and 2 sentences as trial items.

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[1] We would like to thank Shiri Lev-Ari for providing us with the list of statements used in Lev-Ari and Keysar (2010). Because the list of statements was not provided in the original study and we promised not to do so either, the statements will not be published in this study either. The statements cover areas like zoology, history, geography or inventions.

## 2.2. Speaker selection and recording

The sixty statements on the list were recorded by 12 different speakers, who represented four groups. The first group consisted of three native British English speakers of English (two male, one female). The female speaker was from Southern England and the two male speakers from Northern England. In the second group there were three native speakers of English from the United States (one male, two female). The third group was formed by three Czech speakers of English (one male, two female), who studied English as their second language (B level based on CEFR, 2001). The last group consisted of three non-native B-level speakers of English (two male, one female) whose mother tongues were French, Egyptian Arabic, and Russian, and whose degree of accent was comparable to that of the Czech speakers of English (*cf.* Skarnitzl, Volín & Drenková, 2005 for the reliability of accentedness ratings). All speakers were aged between 20 and 40 years. The two trial statements were read by an additional two speakers who were not used in the test, one of them a native speaker of English from Cape Town, the other a proficient non-native speaker from Italy. None of the speakers had any speech impediment. Immediately before the recording they had time to get acquainted with the list of statements in order to prevent dysfluencies when reading. Non-native speakers were encouraged to ask how to pronounce unfamiliar words, so that the meaning of the statements would not be obscured by mispronunciation. The speakers had not been told whether the statements they were reading were true or not, so that their speech was not affected, perhaps subconsciously, by the truth value of the sentences. The speakers did not know the purpose of the study.

## 2.3. Perception test

Two versions of the perception test were prepared (A and B). Each version contained all sixty statements and the two examples. Five statements by each of the twelve speakers were selected for each version of the test, so that the statements which were read by a native speaker in version A were read by a non-native speaker in version B and vice versa.

The respondents were then asked to mark to what extent they believed the statement was true or false, using a 7-point Likert scale with one pole labelled definitely true and the other definitely false. Next to the scale there were two boxes labelled I know the answer, and I did not understand. The respondents indicated whether they knew for a fact that the statement was true or false (marking I know the answer) and they were also asked to mark I did not understand if they, for example, could not understand some vocabulary items or did not hear the sentence properly. When either of these boxes was marked, the given item was excluded from further analyses.

The perception test was administered to 121 listeners, all of them BA-level students of Anglophone studies at universities in Prague, Czech Republic, or

Łódź, Poland2. 94 of them were female, 27 male, and their mean age was 21.2 years. The respondents will be treated as two separate groups: Czech listeners (n = 82) and "other listeners" (n = 39); the latter group includes native speakers of Polish, Russian, Ukrainian, Slovak, or Hungarian. The respondents were told they were going to assess whether the information they hear was true or not. They were told that the speakers they were going to hear had only read a list of statements prepared by the experimenters and they had not known whether the statements they were reading were true or not. The participants were then advised to focus on the content of the statements; this was repeated several times throughout the instructions. In addition, they were told that the statements were intentionally compiled so that their truth value would not be easily determined and they were asked to use 'zero' (the middle of the scale) as little as possible and to really try to form an opinion about the truthfulness of the statement.

## 2.4. Analyses

The results presented in the following section are based on those items in which an actual score was recorded by the respondents and which were not marked for *I know the answer* or *I did not understand* (see above). The analyses were conducted in R (R Core Team, 2017), and we applied linear mixed-effects (LME) modelling to assess the influence of various factors on credibility scores, using the *lme4* package (Bates, Maechler, Bolker & Walker, 2015). The fixed effects incorporated in the analyses were SPEAKER GROUP (native × non-native; subsequently divided into British × American × Czech × other non-native) and RESPONDENT GROUP (Czech × others), as well as RESPONDENT GENDER (female × male). We included two random effects in the analysis – by-RESPONDENT and by-STATEMENT intercepts – to control for the fact that individual respondents are likely to differ in their sensitivity to different statements.

The significance of individual effects or interactions was tested by comparing a full model (which included the factor or interaction in question) to a reduced model in which the given factor/interaction was excluded; we used standard likelihood ratio tests for the evaluation. Tukey posthoc comparisons were conducted using the R package *multcomp* (Hothorn, Bretz & Westfall, 2008). Effect plots showing mean fitted values and the respective confidence intervals were constructed using the *effects* package (Fox, 2003).

## 3. Results

Before examining the effect of individual factors on credibility ratings, we checked the distribution of scores in the groups of respondents, the Czech and the

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[2]   We would like to thank Prof. Ewa Waniek-Klimczak for administering the perception test to the subjects in Poland.

other non-native group, to see whether there were marked differences in how they made use of the 7-interval scale. Figure 1 shows that the distribution of scores is quite similar, although in general the non-Czech respondents tended to ascribe the statements higher truth ratings. Also, we can see that the respondents did avoid the middle point of the scale, as they were instructed.
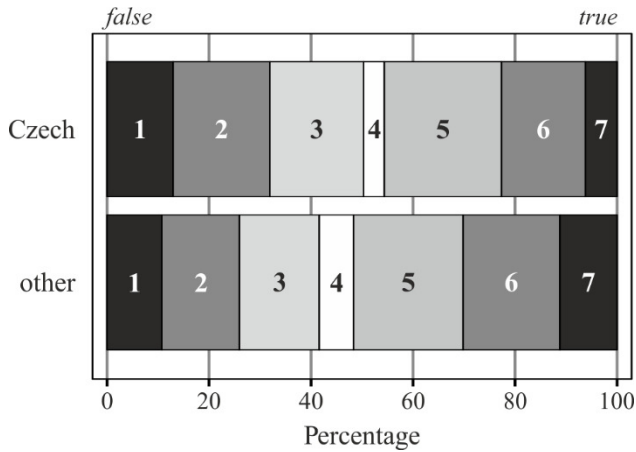


**Figure 1:** Distribution of the credibility scores in the Czech and other respondents.

Let us now turn to the mixed-effects analysis. First of all, we will consider the simplified view, with the SPEAKER GROUP factor corresponding only to the native *vs.* non-native distinction. As predicted, this factor significantly improved the goodness-of-fit of the regression model over the null model which comprised only the intercept and the random effects for RESPONDENT and STATEMENT: $\chi^2(1) = 52.58$, $p < 0.0001$. The difference in credibility evaluations is illustrated in Figure 2, which shows a highly significant difference in favour of the native speakers (Tukey post-hoc test: $p < 0.0001$).
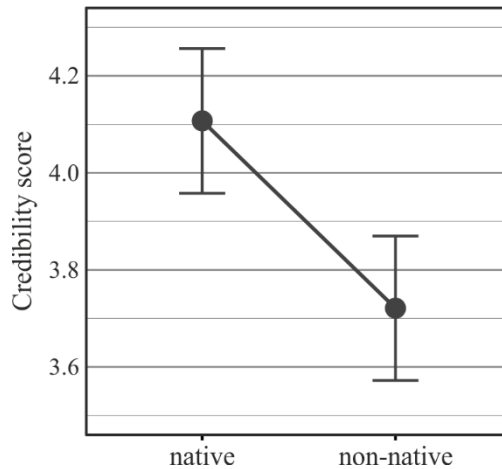
**Figure 2:** Credibility evaluations of native and non-native speakers (1 = definitely false, 7 = definitely true).

As we had each of the statements read by both native and non-native speakers, we also compared mean evaluations of individual statements, as read by native and non-native speakers. 58 statements were used for the analysis; 2 statements had to be excluded from the paired test, as we only had valid data available for one version, native or non-native (mostly, respondents had not understood the two statements). A t-test for repeated measures confirmed the lower credibility ratings of statements delivered by non-native speakers: $t(57) = 3.5$; $p < 0.001$.

Up until now, the respondents were treated as a homogenous group, regardless of their gender and mother tongue. As for RESPONDENT GENDER, no noteworthy tendencies were revealed; however, it must be kept in mind that the majority of our participants were female. In the next step, the respondents are divided according to their mother tongue: Czech listeners ($n = 82$) and others ($n = 39$); see section 2.3. It is obvious from Figure 3 that adding RESPONDENT GROUP as a factor leads to a highly significant improvement of the regression model: $\chi^2(2) = 23.0$, $p < 0.0001$. The figure confirms the above-mentioned tendency for the non-Czech respondents to regard the statements as more credible than the Czech respondents (Tukey post-hoc test: $p < 0.001$ for both speaker groups); the interaction is not significant, however, and the scores by the "others" group are merely shifted upwards on the credibility scale. Most importantly, the evaluations for both listener groups are significantly lower for the non-native speakers than for the native speakers (Tukey: $p < 0.001$ for the Czech participants, $p < 0.005$ for the other participants).
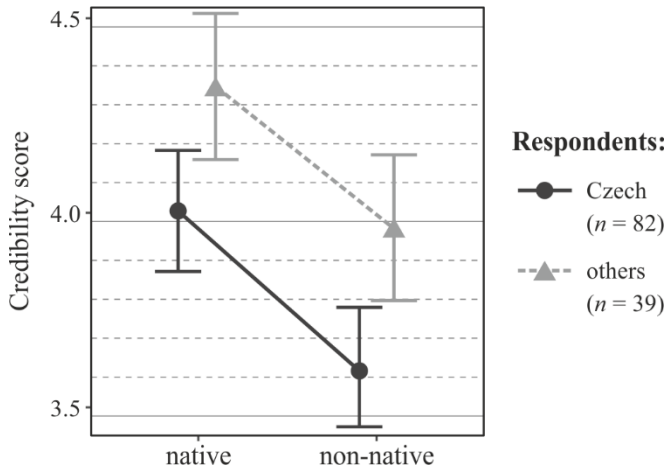
**Figure 3:** Credibility evaluations of native and non-native speakers by Czech (dark grey, full line) and other (light grey, dashed line) respondents. (1 = definitely false, 7 = definitely true).

In the final step, we examined the credibility evaluations with the SPEAKER GROUP factor expanded (see sections 2.2 and 2.4) to see whether there are differences in how trustworthy the statements delivered by the four groups of speakers are perceived by our listeners. In this model, the interaction between the RESPONDENT and SPEAKER GROUP was incorporated into the random effects, so as to capture the randomness more systematically. The regression model was improved upon by the addition of this expanded SPEAKER GROUP factor, as compared with the previous analysis, although less significantly: $\chi^2(4) = 13.1$, $p < 0.05$.

As is shown in Figure 4, the results are slightly surprising in that the native *vs.* non-native distinction is much less straightforward in this fullest model. The respondents of both listener groups were most likely to believe the statements read by the British speakers, but the statements read by the American speakers scored lower (albeit not significantly with respect to the British group: $p > 0.1$ for both respondent groups, according to the Tukey post-hoc test). The right part of the figure shows that there is no significant difference between the truth rating of the Czech speakers and the other non-native speakers (marked NN in the figure; $p > 0.8$). More importantly, however, there is also no significant difference between the truth rating of the American and Czech speaker group ($p > 0.3$). The differences in credibility ratings which do remain significant are between British *vs.* Czech speakers ($p < 0.001$ for Czech listeners, $p < 0.05$ for other listeners) and British *vs.* other non-native speakers ($p < 0.001$ for both listener groups), as well as American *vs.* other non-native speakers ($p < 0.05$ for the Czech respondents).
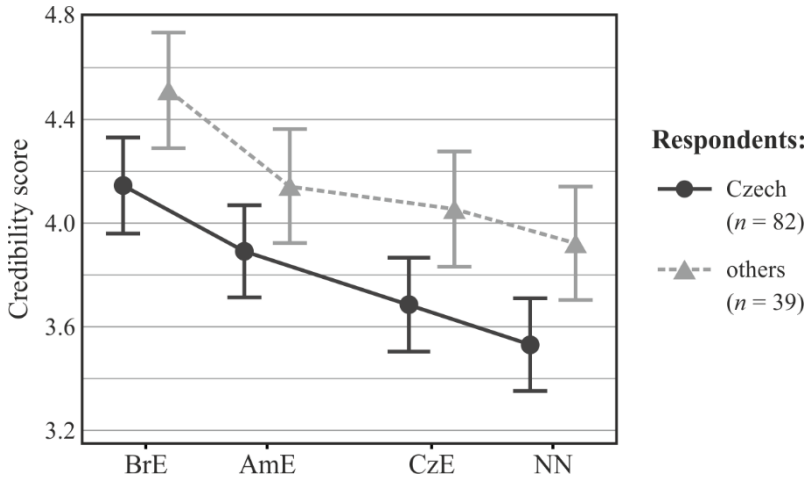
**Figure 4:** Credibility evaluations of the four groups of speakers – British (BrE), American (AmE), Czech (CzE), and other non-native (NN) – as evaluated by Czech (CR) and other non-native (OR) respondents (1 = definitely false, 7 = definitely true).

Finally, let us point out that Figure 4 provides yet another confirmation of the tendency of the other respondents to award higher credibility scores to the speakers in general (the difference between the evaluations of the Czech and other listeners is not significant only for the American speakers: $p > 0.1$).

## 4. Discussion

First of all, let us revisit the results obtained by Lev-Ari and Keysar (2010), who observed that native American listeners perceived foreign-accented speech as less truthful than native speech. The aim of our study was to extend their study by investigating the responses of non-native listeners to the same set of stimuli. Broadly speaking, our results indicate that foreign-accented speech negatively influences the perceived truthfulness also in the ears of non-native listeners of English (see Figs. 2 and 3). However, upon closer examination, when the individual speaker groups are treated separately, the difference between the ratings of native and non-native speakers is somewhat blurred: the ratings of the American speakers fall between those of the British English group and the non-native speaker groups (Fig. 4). The reason for this intermediate evaluation of the credibility of our American speakers is not clear and has to be verified on a sample of other listeners; that is why we are planning to administer the perception test to French listeners. We believe, however, that the significant difference between the British speakers on the one hand and both non-native speaker groups on the other hand does allow us to offer the tentative conclusion that foreign-accented speech may be associated with lower credibility ratings by non-native listeners.

Our main finding brings new arguments to the debate whether it is desirable for learners of English to use native-like pronunciation as a model (e.g. Szpyra-Kozłowska, 2015 and her concept of NELF). ELF proponents claim that mutual intelligibility is the only important factor in international communication, going as far as suggesting that native-like accent might actually be a hinderance for communication among non-native speakers (Jenkins, 2011). Our results demonstrate, however, that non-native listeners, too, are sensitive to non-native English, and that subconscious attitudes to language varieties are thus relevant in the context of international communication as well.

One of our partial findings was the tendency for the group of other non-native respondents (consisting of native speakers of Polish, Russian, Ukrainian, Slovak, and Hungarian) to rate nearly all groups of speakers significantly higher on the truthfulness scale than the group of Czech respondents (see Figs. 3 and 4). There is no readily apparent explanation for this difference, and we plan to explore the issue further by administering the perception test to French and possibly other non-native listeners, in order to better understand the attitudes non-native speakers hold towards non-native accents of English. Nevertheless, despite the generally higher evaluations of the other non-native respondents, the difference in rating between the native and non-native speakers remained significant for both groups of non-native listeners (Czech and Other).

To conclude, the results of our experiment revealed a difference between the perceived veracity of statements read by native and non-native speakers of English, with a significant bias in favour of native speakers. In future research, we will incorporate a more diverse group of listeners to achieve better generalizability of the results, and to verify some of the tendencies observed in the current data.

## Acknowledgement

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