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Bachelor's thesis, group 5
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7-6-2024

Do accents speak louder than words? A study into the perceptions of accented doctors and listeners' personality dynamics

Abstract

Accented speech is a common phenomenon nowadays, yet its influence on listeners' perceptions and the influence of listeners' personality on these perceptions, particularly in high-stakes contexts like healthcare, remains underexplored. This study aimed to determine whether doctors who speak with a non-standard, foreign accent are perceived as less competent, trustworthy, and comprehensible than doctors who speak with standard accents, and to examine the role the listener plays by examining listeners' personalities. Participants listened to an audio fragment of a doctor speaking either standard British-accented English, French-accented English or Ukrainian-accented English, and afterwards rated the doctor on perceived competence, trustworthiness and comprehensibility while also completing a personality test. Results indicate that doctors with a standard British accent were consistently rated higher on perceived competence, trustworthiness and comprehensibility compared to doctors with French or Ukrainian accents. Moreover, high scorers on the emotionality, openness to experience and honesty-humility dimensions tended to rate doctors higher on perceived trustworthiness. These findings suggest a preference for native speakers and highlight the impact of listeners' personality traits on the perception of accented speech.

Introduction

In today's globalized, interconnected world, interacting with individuals from divers nationalities and ethnic backgrounds has become an integral and inevitable part of daily life. Societies have increasingly become more diverse over the years, reflecting a rich mix of individuals from various cultural and linguistic backgrounds. Beyond just economic migration, numerous conflicts have forced a significant number of people to relocate across borders to seek refuge in new lands. This diversity is reflected in the workforce, with people from different backgrounds working together. Consequently, a substantial number of individuals are required to speak a foreign language, navigating a complex interplay of perceptions and stereotypes related to their accent, often resulting in assumptions about their nationality or ethnicity. This can be particularly impactful in high-stakes settings, for instance in the medical doctor-patient interaction, where there is no room for communication barriers or stereotyping as it can jeopardize the quality of care provided. The purpose of this experimental study is to investigate whether doctors' perceived competence, trustworthiness and comprehensibility are influenced by their accent, and to determine whether these perceptions solely stem from accented speech, or if they are also influenced by the personality of the listener.

This growing linguistic and multicultural diversity in societies underscores the necessity of a common language for effective communication, with English frequently serving this purpose. Adopting English as a universal lingua franca has significantly transformed global communication and interconnectedness. Nowadays, English is not only seen as the common language and preferred medium of communication among speakers from different linguistic backgrounds, but it also often serves as the sole option to communicate (Seidlhofer, 2009). Nonetheless, with this development comes an interplay of perceptions, stereotypes and attitudes towards non-native speakers. The emphasis on adhering to a native-speaker's accent serves as an obstacle, not aimed at improving comprehensibility but at maintaining political, economic, and social prestige or dominance (Poppi, 2012). This focus can marginalize non-native speakers with an accent, fostering a sense of inequality based on stereotyping.

Previous research has demonstrated that speakers with a non-standard accent are susceptible to inferences and judgments based solely on their accents (Lev-Ari & Keysar, 2010). This phenomenon is driven by the association of accents with particular cultures, countries or social groups (Fuertes et al., 2011). In essence, stereotypes and accentedness are

closely intertwined, as accented speech often functions as the base of stereotypes about the speaker. Consequently, accents serve as a marker of socio-cultural associations and a trigger for stereotypes associated with the accent. These inferences are connected to social categorization; research by Campbell-Kibler (2007) demonstrated that accents can be linked to social divisions between groups, which can in turn trigger social categorization of individuals based on their accents. In other words, accents pertain to complex perceptions and inferences beyond being mere deviations in speech.

The inferences drawn from individuals' accents can be detrimental. For instance, foreign-accented speech can be linked to perceptions of being uneducated, less reliable, and less interesting (Tsurutani, 2012). This poses challenges in various contexts, such as job interviews or medical settings. Within the realm of accented research in the medical context, research has shown that a foreign accent negatively influenced perceptions of doctors' competence. That is, a non-standard Chinese-accented doctor was perceived by listeners as less competent than a standard Canadian-accented doctor (Baquiran & Nicoladis, 2019). This highlights how accents can influence perceptions beyond speech-related attributes, potentially leading to complications in high-stakes scenarios.

However, not all accents are subject to the same (negative) perceptions. An exception to this is British-accented English, which has been proven to be more positively evaluated than other accents of English. Lippi-Green (2012) demonstrated that speakers with a British accent are often evaluated positively by non-native English speakers. This positive evaluation is tied to language attitudes and stereotypes that associate British English with status, prestige, beauty and sophistication (Ladegaard, 1998; Carrie, 2016). In addition, this perception may be rooted in historical factors, as stated by Mooney and Evans (2023), who indicate that the United Kingdom is commonly perceived as the origin of the English language and therefore holds authoritative status when it comes to defining 'standard' English. In this research, British-accented English is perceived as the standard form with speakers regarded as native, while Ukrainian-accented and French-accented English are seen as deviations from this standard, representing non-native speakers.

To understand the accentedness of these non-native English speakers, it is crucial to recognize that, both the French and Ukrainian language exhibit substantial differences in their phonetic and phonemic systems compared to English. Research conducted by Parashchuk (2019) has indicated that phonemic and accentual differences contribute to native Ukrainian speakers having an accent when speaking English. Ukrainian speakers often rely on stress patterns from their native language when pronouncing English words, leading to

pronunciation deviations. Additionally, they may misplace lexical stress in compound words, potentially impeding comprehension by altering them as if they were phrases instead of words. Consequently, the unequal intensity and duration of certain speech productions in English is a product of the phonemic structure of the Ukrainian language.

On the other hand, the French language possesses more differences in their phonetic system when comparing it to the English language. As stated by Otruba (2016), a primary issue contributing to French individuals' accent is the mispronunciation of English vowels. Due to differing vowel systems, French lacks some vowels that are used in English. Consequently, French speakers adapt the pronunciation of these vowels to fit the French vowel system, resulting in mispronunciations. Furthermore, consonants like dental fricatives and the 'h' sounds are mispronounced or omitted entirely. These variations in phonetic and phonemic tendencies across languages contribute to the distinct pronunciation patterns and accents observed when native speakers of French and Ukrainian speak English, making it appropriate non-standard accents to compare in this research.

The relevance of including these accents is heightened in countries such as the Netherlands and the United Kingdom, where there is a vast network of individuals from diverse linguistic backgrounds. This phenomenon is further enriched by the recent stream of Ukrainian refugees due to the ongoing war with Russia. Despite this, limited attention has been given to academic research on Ukrainian-accented English. Given the recent global developments, Europeans in particular are increasingly likely to encounter Ukrainians speaking English with an accent, making this research more theoretically relevant than ever.

Moreover, existing research has predominantly concentrated on the impact of the accented speaker, leaving a notable research gap in understanding the potential influence of the listener on the perceptions that accentedness evokes. Deprez-Sims and Morris (2013) highlighted the role of the listener by stating that the perception of an accent as being 'foreign' is influenced by the listener's subjective judgment, which is shaped not solely by objective speech characteristics but also by social and economic factors. Thus, this study deviates from standard research approaches by shifting the focus towards the listener, rather than solely focusing on the speaker. It is aimed to explore whether evaluation patterns could be traced back to intrinsic factors within the listener. Specifically, it investigates the potential effects of listeners' personalities in shaping perceptions of accentedness. If findings indicate that listeners indeed exert influence in this regard, it could necessitate the adoption of other communication styles within medical settings to account for these nuances, thereby underscoring the practical relevance of this study.

In the realm of personality testing, several test have been developed in order to measure the most important aspects of a subjects personality. The two most popular ones are the big five inventory and the HEXACO model of personality structure. Testing personality can be a complex and time-consuming concept. Therefore, these tests were designed to use a short questionnaire to assess dimensions of personality. In a study comparing the HEXACO-60 scales and scales measuring the Big Five personality factors, Ashton and Lee (2009) recommended the use of the HEXACO-60 measure to researchers when only a short inventory was permitted. In addition, a study conducted by García et al. (2021) concluded that the HEXACO-60 is a good instrument to use across ethnic and linguistic borders. This entails that the test measures the same constructs across countries and languages. In this study, participants completed the originally English HEXACO-60 test in a Dutch-translated version. As previous research has shown, this test maintains consistency in measuring the same constructs even when administered in a different language. In other words, its brief administration time and cross-national stability make the HEXACO-60 test most suitable for this research.

The HEXACO-60 assesses personality across six dimensions, namely honesty-humility, emotionality, extraversion, agreeableness (versus anger), conscientiousness and openness to experience, which can be grouped into two broad categories. Social/group-, work- and idea-related traits are reflected in extraversion, conscientiousness and openness to experience. Altruistic traits are captured by honesty-humility, emotionality and agreeableness (Romano et al., 2023). As stated by Lee and Ashton (2004), individuals with high scores in the honesty-humility dimension avoid manipulating others, are not tempted to break the rules and are not driven by wealth or social status. Those with high emotionality scores feel fear for physical dangers, experience anxiety in response to stress, need emotional support, feel empathy and feel sentimental attachment to others. High scorers on extraversion are confident, enjoy social interactions and feel enthusiastic and energetic. Individuals with high agreeableness scores forgive easily, are cooperative and willing to compromise, are lenient in judging others and control their temper. Those high in conscientiousness are organized, disciplined, strive for accuracy and perfection and deliberate decisions carefully. Lastly, high scorers on openness to experience appreciate art and nature, are curious about various domains of knowledge, imaginative and interested in unusual ideas or people.

Understanding the interplay between accentedness and the role the listener plays is valuable. As previously mentioned, research has shown that accents, even within medical contexts, can elicit negative perceptions by listeners. The extent of these negative perceptions

can depend on the specific context in which the accented-speech is encountered. For instance, in the context of the college classroom, a Chinese-accented speaker was deemed less attractive, whilst in a job interview, the speaker was treated similar to a standard American-accented speaker (Cargile, 1997). However, a notable research gap exists within the medical context. Essentially, previous studies have predominantly focused on the linguistic and socio-cultural dimensions of accent perception among doctors, overlooking the potential role of listener personality. This should be addressed, as individual differences in personality traits may shape perceptions and judgments during accented interactions, potentially affecting speaker evaluations. This is of particular value in doctor-patient interactions, where clear communication fosters greater patient trust which indirectly benefits patients' health (Street et al., 2009). Thus communication is not merely a means for doctors to convey information, but also a factor that contributes to patients' health.

An additional research gap pertains to subject selection. LaVeist and Nuru-Jeter (2002) demonstrated that patients tend to choose physicians who share their racial background. Additionally, respondents indicated a higher satisfaction with racially concordant physicians. In other words, there exists a preference for doctors who share the patient's racial and linguistic background. However, previous studies on accentedness in the medical context often used participants who share the same linguistic or ethnic background as the doctor. This bias should be accounted for by examining participants who do not share the same linguistic or ethnic background as the doctor. In addition, trustworthiness in particular has received limited attention in academic research, despite indications that probity is one of the most valued attributes in a doctor (Lambe & Bristow, 2010).

Addressing these research gaps is crucial for gaining a comprehensive understanding of the factors contributing to negative evaluations based on non-standard accents. Research can enhance our understandings of the interplay between accent perception, listener personality and evaluative judgments in a high-stakes context where no room is left for problems related to linguistic aspects of the interaction.

This experiment aims to provide new insights into the realm of accented speech within a medical context by means of the following research question:

To what extent do Dutch listeners perceive the competence, trustworthiness and comprehensibility of standard British-accented English, Ukrainian-accented English and French-accented English doctors differently, and how do these perceptions correlate with the influence of listeners' personality?

Based on previous research it is expected that Ukrainian-accented and French-Accented healthcare professionals speaking the English language will be perceived as less competent, trustworthy and comprehensible compared to the standard British-accented healthcare professional.

H1: Doctor's who speak English with a non-native accent, namely the Ukrainian and French-accented English speakers, will be perceived as less competent, trustworthy and comprehensible compared to the native British-accented doctor.

In addition, it is expected that the personality of listeners will contribute to the perceptions about accented healthcare professionals.

H2: Listeners who share comparable personality traits tend to exhibit similar patterns in the extent to which they (negatively) asses the competence, trustworthiness and comprehensibility of accented doctors.

Method

Materials

An experiment was conducted to explore the two independent variables within this study, namely 'type of accent' and 'listeners' personality.' The personality of the listeners was assessed using the HEXACO-60 test. As stated above, this test is time-efficient and measures the important characteristics of personality cross-nationally. It measures six dimensions of personality, namely honesty-humility, emotionality, extraversion, agreeableness, conscientiousness and openness to experience by means of 60 statements (Appendix B).

The personality test that participants had to complete, was not named as such. One of the problematic issues related to self-reporting questionnaires pertains to the potential for the social desirability bias and the related concept of positive impression management to confound with the outcomes of the studies (Nederhof & Lispor, 1985). Allowing participants to self-report, as they will need to do with the personality test, carries the risk that they might be inclined to provide responses that they perceive as being socially desirable. This possibly leads to the provision of untruthful answers by participants to present themselves in a more favorable light. Consequently, the social desirability bias could impact the reliability and validity of the results. To mitigate this bias as much as possible and encourage participants to answer honestly, participants were assured prior to the experiment that their responses would remain anonymous and that the results would be used solely for research purposes, thereby ensuring confidentiality. In addition, the test was not named a personality test, but participants were told they are taking an 'individuality assessment.' It is believed that this indirect wording conveys the idea of evaluating individual characteristics, without explicitly using the term 'personality test.'

The operationalization of 'type of accent' involved six conditions, encompassing three different accents; standard-accented British English (1), French-accented English (2) and Ukrainian-accented English (3). The verbal guise technique was employed using audio recording of the different accented speech samples to assess listeners' perceptions. To obtain the audio recordings, the researchers utilized their international network, soliciting native speakers of English, French and Ukrainian to record a predefined message in English. Each accent condition featured two young adult male speakers who each recorded one accented message to avoid potential confounding variables such as gender and individual differences with regard to voice characteristics. All speakers were native to the language corresponding to the accent they portrayed; thus, the two British accented speakers were native English

speakers from the United Kingdom, specifically London. The two French accented speakers had French as mother tongue and were born and raised in France. Both Ukrainian accented speakers are native Ukrainian speakers, however one of them was raised in Poland, whilst still speaking Ukrainian as his first language. Both were associated with Northern Ukraine, around Kiev. All speakers had a sufficient level of English proficiency, largely attributed to their education in English-taught schools, enabling them to understand and accurately record the required messages.

To ensure the representativeness and authenticity of the recorded accent, the audio recordings were submitted to experts in each linguistic domain for evaluation. Specifically, the British audios were assessed by an expert in world Englishes and social linguistics. The French audios were reviewed by an expert in the French language. Lastly, two experts were asked to evaluate the Ukrainian-accented audios. The first evaluator was a trainer of Dutch as a second language and foreign language learning expert of Ukrainian descent. The second expert was an assistant professor of English language possessed expertise when it comes to English as a foreign language and Ukrainian English in particular. Following the evaluations, all six recordings were evaluated as representative of their respective accent. The length of the recordings ranged between 42 seconds to one minute and 11 seconds in duration.

The rationale for selecting male speakers was grounded in the belief that males are often associated as having more authority, thus potentially being taken more seriously. This is supported by Smith (2002), who stated that women are taken less serious and are seen as having less authority due to the continuous location in the marginalized structures of the economy. To account for a potential confounding variable, the stimulus material were one-way audio fragments recorded by six accented males depicting the role of the doctor. They communicated information regarding their medical complaints to the listener, who portrays the role of the patient in this scenario.

With regard to the content of the message, it is important to maintain a high degree of neutrality. Previous research has suggested that a bias may appear when participants listen to positive as well as negative news delivered by doctors. In essence, Maynard (1998) stated that listeners blame immoral characteristics to the messenger when delivering bad news, leading them to blame the messenger. This entails that the mere act of delivering bad news can affect patients' perception of healthcare professionals' competence. Therefore, the fact that it is bad news being delivered may confound with perceptions about competence. Similarly, the cue-diagnosticity model of impression formation (Skowronski & Carlston, 1987) and the schematic model of dispositional attribution (Reeder & Brewer, 1979) show that positivity

effects arise when information refers to competence-related qualities of the target. Therefore, it can be inferred that a positivity bias may occur, leading participants or patients to evaluate their doctor as more competent.

Consequently, to make sure that the content of the message does not lead to bias, the message conveyed should have a neutral connotation. To maintain neutrality, the message content will focus on common complaints that many individuals experience. In this case, the scenario involved patients visiting the doctor with complaints if headaches. The content of the message conveyed neither positive nor negative news; it is an explanation regarding the potential explanations for the patient's headaches. The researchers formulated the following message:

"A headache can have several causes, but after the tests we did, we can tell that your blood pressure is within the normal range. In addition, your cholesterol levels are looking good. We can rule out things like migraines, sleep related issues and dehydration. You did mention that you moved away from your hometown to the UK recently. I can assume this comes with a certain amount of stress or anxiety, which can also be causes of tension-related headaches. This corresponds to the feeling you described of the headache being like a tight band around your head. Therefore I expect the headaches to disappear once you are more adapted to your new life and new environment. However, just to rule out any other medical causes, I will send you to the building next door to have your blood drawn. You call me in 3 days so we can discuss the results. Good luck!"

It is believed that the message maintains a high degree of neutrality as it is free from positivity and negativity biases commonly associated with delivering good or bad news. In addition, the facts are presented in an objective matter without expressing emotion. Opting for a routine procedure was seen as appropriate, as it offers a straightforward description of what is believed to be the cause of the patient's medical complaint. Lastly, the complaints are relatable to many individuals, thus minimizing any potential bias stemming from shock or incomprehensibility due to medical jargon.

Design

This experiment compared participants' perceptions of doctors speaking with different accents and correlated these perception with the listeners' personality traits. The first independent variable, accent type, was studied at three levels. Participants listened to an audio fragment

containing either standard British-accented English, French-accented English or Ukrainian-accented English. A between-subjects approach was employed in which participants were randomly assigned to one of the six conditions. By means of probability sampling, the participants were randomly assigned to either group, resulting in approximately 32 participants per experimental condition.

Conversely, listeners' personality, the second independent variable, was assessed using a within-subjects design where each participant answered the same set of questions of the HEXACO-60 personality test. Subsequently, the participants' scores were analyzed across the six dimensions of personality. However, due to incomplete responses where some participants failed to fill in the personality test, the sample sizes across the conditions were not similar. Consequently, it was not possible to examine an interaction effect between accent and personality.

Therefore, the experiment adopts a mixed-factorial 3x1 design.

Instruments

In this experiment, an online questionnaire was used to measure doctors' perceived competence, trustworthiness and comprehensibility. To measure perceived competence and trustworthiness, a 7-point Likert scale was used ranging from "strongly disagree" (1=helemaal mee oneens) to "strongly agree" (7=helemaal mee eens). Similarly, participants had to rate the doctor on comprehensibility by means of a 9-point likert scale ranging from "not difficult to understand at all" (translated to Dutch: 1=de dokter is makkelijk verstaanbaar) to "very difficult to understand" (translated to Dutch: 9=de dokter is moeilijk verstaanbaar). In essence, the questionnaire consists of a total of twelve statements that are meant to measure listeners' attitude towards accented healthcare-professionals' skills. The internal consistency of the scales used in the questionnaire was high, with Cronbach's alpha values of α=.882 for competence, and α= .803 for trustworhiness. In addition, the reliability of the scales used to measure the six dimensions of personality were reliable, with Cronbach's alpha ranging from acceptable (α=.615) to good (α=.813).

The assessment of these qualities were not chosen randomly. Firstly, previous studies have revealed that a foreign accent negatively influenced perception of doctor's competence (Gluszek & Dovidio, 2010; Ryan et al., 1977). As competence is one of the most important qualities of a doctor from a patient's point of view, competence was also studied in this experiment. Secondly, a study performed by Lambe and Bristow (2010) demonstrated that one of the most important core attribute of a good doctor, besides its academic knowledge, is

probity. In other words, being honest and trustworthy is one of the characteristics that is valuable in making a good doctor. However, limited research has been done with regard to the effect of accented-speech on perceived trustworthiness in a medical setting, highlighting the importance and relevance of including this as a variable in the present study. Lastly, part of the reason for the negative evaluation of accented people is that they are perceived as difficult to understand (Hansen & Dovidio, 2016). As a medical setting can be attributed as a high-stakes situation, comprehensibility is of great importance to avoid communication implications.

Another aspect that needs to be taken into consideration is the fact that Dutch natives completed a questionnaire in their native language, despite evaluating individuals speaking another language, namely English. The decision to provide the questionnaire in their native language is based on previous research indicating a response bias known as the anchor contraction effect. This bias refers to the tendency of participants to convey stronger emotions when using rating scales in a non-native language than when expressing themselves in their native language. A study done by de Lange et al. (2011) demonstrated that individuals indeed experience emotions more strongly in their native language, but they report emotions more strongly in their second language. To control for this response bias, it is decided that the questionnaire and the personality test were administered in the participants' native language.

The questionnaire starts with six questions about participants' demographic characteristics (Appendix A, question 1-6). Furthermore, it consists of five statements used to measure competence (Appendix A, question 7-11), based on a questionnaires that had been used in previous research assessing competence (Hendriks et al., 2014). In addition, six statements measuring trustworthiness (Appendix A, question 12-17) were included from a questionnaire created by Brockway (1978). The statement in which participants had to indicate the level of comprehensibility (Appendix A, question 18) was based on research done by Munro and Derwig (1995). Due to the scales being based on previous research, it was deemed valuable to maintain the differing 7-point and 9-point Likert scales, rather than using a single scale for all 12 items. These close-ended survey questions will measure participants' attitudes and perceptions towards the accented healthcare professionals. Lastly, in an open question (Appendix A, question 19), participants will be asked to indicate their guess about the linguistic or ethnic background of the doctor they just listened to as this may reveal underlying stereotypes or biases associated with different accents. Essentially, if participants consistently associate a particular accent with a certain country or ethnicity, it may indicate prevalent stereotypes or cultural associations linked to that accent.

Subjects

Following the data collection, a total of 299 participants responded to the questionnaire. However, not all responses were suitable for analysis. Initially, participants who started the questionnaire but failed to complete any questions were excluded from the dataset. Moreover, since the study specifically targeted Dutch students, responses from individuals who were neither students nor Dutch were also eliminated. Consequently, the final sample comprised 193 highly-educated Dutch students (69 males, 118 females, 6 other), with a mean age of 21.14 years (SD=1.71, range=18-26). In this context, 'highly-educated' refers to students enrolled at the University or HBO (higher professional education) level. In addition, participants were restricted to individuals holding a Dutch nationality. This decision was informed by previous research that indicates a preference among patients for doctors who share their racial and linguistic background (LaVeist & Nuru-Jeter, 2002). In essence, Dutch participants were chosen to account for this bias, as they share no racial or linguistic background with the English language, nor with the French and Ukrainian accents.

An additional advantage is that Dutch students possess a strong proficiency of English (M=6.63). As explained by Admiraal et al. (2006), this can be attributed to the prominent place of English in Dutch society and the educational system. In view of the fact that the participants are instructed to listen to a message in English, Dutch students are well-equipped to effectively engage with the experimental content. Therefore, it will not be a concern as to whether the participants can actually understand the message.

Of the 193 participants, some discontinued the questionnaire after completing the questions pertaining to the accented speech sample, and therefore did not complete the personality test. Thus, data from only 167 participants was utilized for the analysis of listener personality. Consequently, the uneven distribution of participants across accent groups that did fill in the personality test prevented the researchers from examining an interaction effect between accent type and listeners' personality.

Procedure

Participants were selected based on the criteria above. They were gathered by means of convenience sampling. The researchers distributed the questionnaire using an online link in addition to approaching Dutch students on campus with a QR code directing them to the survey upon scanning. To facilitate the process, the whole experiment was conducted online. Apart from the audio fragments, the questionnaire was administered entirely in Dutch.

Participants were randomly assigned to the Ukrainian-accented English, French-accented English or standard British-accented English condition. All participants were shown the same message pervious to engaging in the experiment, explaining the consent from and what their data will be used for without disclosing the research goal. This is to prevent bias, as participants may unconsciously or consciously alter the responses to align with what they believe the researcher is looking for, compromising the validity of the data.

Upon stating their consent, participants were presented six demographic questions concerning topics such as their age, educational level, self-reported English language proficiency and gender. This was followed by a scenario sketch disclosing information about the imaginary situation that the participant needs to keep in mind. It was stated that the participants had to envision themselves as exchange students in the United Kingdom, having to visit the doctor's office after ongoing headaches. The participant was instructed to listen to an audio fragment in which the doctor disclosed more information about the headache, its potential causes and recommendations. In addition, it was highlighted that participants could only listen to the audio once to prevent potential bias in their perception of comprehensibility that could arise if they were permitted multiple listens.

Depending on the group to which participants were randomly assigned, they listened to the doctor's accented speech message. Respondents were asked to express their agreement or disagreement with eleven statements about competence and trustworthiness. They responded by means of a 7-point Likert scale ranging from 1 to 7, with 1 indicating "strongly disagree" (translated to Dutch: 'helemaal mee oneens') and 7 indicating "strongly agree" (translated to Dutch: 'helemaal mee eens'). In the statements, the speaker was intentionally referred to as 'doctor' rather than using another term like 'person' to emphasize and remind participants of the medical context. In addition, participants were asked to rate the perceived comprehensibility of the doctor by means of a 9-point Likert scale ranging from 1= not difficult to understand at all (translated to Dutch: 'de dokter is makkelijk verstaanbaar') to 9= very difficult to understand (translated to Dutch: 'de dokter is moeilijk verstaanbaar'). The decision to employ a 9-point Likert scale for comprehensibility, unlike the 7-point scale used for competence and trustworthiness, was based on the scales and statements from previous research, and thus remained unchanged. Lastly, participants were asked to guess where the speaker is from.

Upon proceeding to the next page, participants were informed of the nationality of the accented speaker they had just listened to. In a debriefing question, they were asked whether they would be comfortable with being helped by a doctor of that nationality.

To finish up the questionnaire, participants were instructed to fill in the individuality test. However, as previously mentioned, not all participants reached the personality test section, resulting in data from only 167 participants. They were presented 60 statements from the HEXACO-60 personality test, for which they had to show their agreement or disagreement. A 5-point Likert scale was used with 1 indicating "strongly disagree" (translated to Dutch: 'helemaal mee oneens') and 5 indicating "strongly agree" (translated to Dutch: 'helemaal mee eens').

Statistical treatment

To analyze the results, univariate analyses of variance were conducted to test the differences between the means of the six speakers and the three accents. In addition, a chi-square tests was performed to see whether there are any differences with regards to participants' familiarity to the respective accents. Lastly, a correlation tests was performed to examine the relation between listeners' scores on each personality dimension, and the ratings they attributed to perceived competence, trustworthiness and comprehensibility. It is aimed to see how the independent variables influence the dependent variables of doctors' perceived competence, trustworthiness and comprehensibility. Additionally, several post hoc analyses were performed to understand the potential interaction effects.

Results

Section 1

In the first section, the individual speakers were compared with regard to their ratings on perceived competence, trustworthiness and comprehensibility. The aim was to identify any significant differences between the two speakers within each accent group. Therefore, we were only interested in comparing the differences between indviduals from the same accenet group. If no significant differences are found between the two individual speakers of one accent group, the speakers within each accent group can be consolidated into a single category. This allows for the evaluation of the accent group as a whole, thereby ensuring that the results are derived from the characteristics of the accented speech itself, rather than being influenced by individual variations among the speakers.

1.1 Competence x speaker

Table 1: Descriptive statistics for competence ratings of each individual speaker

	N	*M*	*SD*
British1	33	5.19	1.02
British2	31	5.34	1.01
French1	33	4.73	.92
French2	32	4.87	1.01
Ukrainian1	32	4.56	1.12
Ukrainian2	32	5.01	.81
Total	193	4.95	1.01

Table 2: ANOVA results for competence ratings of each individual speaker

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.45	5	2.69	2.77	.020
Within Groups	181.81	187	.97		
Total	195.26	192			

Table 3: ANOVA effect sizes for competence ratings of each individual speaker

			95% Confidence Interval	
		Point Estimate	Lower	Upper
CompT	Eta-squared	.069	.001	.125

	Epsilon-squared	.044	-.025	.102
	Omega-squared Fixed-effect	.044	-.025	.101
	Omega-squared Random-effect	.009	-.005	.022

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.
b. Negative but less biased estimates are retained. not rounded to zero.

Table 4: Multiple comparisons for competence rating for each individual speaker (Bonferroni)

					95% Confidence Interval	
(I) Speaker	(J) Speaker	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
British1	British2	-.142	.247	1.000	-.87	.59
	French1	.467	.243	.841	-.26	1.19
	French2	.319	.245	1.000	-.41	1.05
	Ukrainian1	.638	.245	.148	-.09	1.37
	Ukrainian2	.188	.245	1.000	-.54	.92
British2	British1	.142	.247	1.000	-.59	.87
	French1	.608	.247	.218	-.13	1.34
	French2	.460	.248	.982	-.28	1.20
	Ukrainian1	.779*	.248	.030	.04	1.52
	Ukrainian2	.329	.248	1.000	-.41	1.07
French1	British1	-.467	.243	.841	-1.19	.26
	British2	-.608	.247	.218	-1.34	.13
	French2	-.148	.245	1.000	-.88	.58
	Ukrainian1	.171	.245	1.000	-.56	.90
	Ukrainian2	-.279	.245	1.000	-1.01	.45
French2	British1	-.319	.245	1.000	-1.05	.41
	British2	-.460	.248	.982	-1.20	.28
	French1	.148	.245	1.000	-.58	.88
	Ukrainian1	.319	.247	1.000	-.41	1.05
	Ukrainian2	-.131	.247	1.000	-.86	.60
Ukrainian1	British1	-.638	.245	.148	-1.37	.09
	British2	-.779*	.248	.030	-1.52	-.04
	French1	-.171	.245	1.000	-.90	.56
	French2	-.319	.247	1.000	-1.05	.41
	Ukrainian2	-.450	.247	1.000	-1.18	.28
Ukrainian2	British1	-.188	.245	1.000	-.92	.54
	British2	-.329	.248	1.000	-1.07	.41
	French1	.279	.245	1.000	-.45	1.01
	French2	.131	.247	1.000	-.60	.86
	Ukrainian1	.450	.247	1.000	-.28	1.18

*. The mean difference is significant at the 0.05 level.

A one-way univariate analysis of variance showed a significant effect of speaker on perceived competence ($F(5,187)=2.77$, $p=.020$, $\eta 2=.069$). No significant differences were found between British1 and British2 ($p=1.00$). In addition, no significant differences were found in perceived competence between French1 and French2 ($p=1.00$), and Ukraine1 and Ukraine2 ($p=1.00$).

1.2 Trustworthiness x speaker

Table 5: Descriptive statistics for trustworthiness ratings of each individual speaker

	N	*M*	*SD*
British1	33	5.26	1.08
British2	31	5.40	1.03
French1	33	4.67	.76
French2	32	4.73	1.12
Ukrainian1	32	4.07	1.12
Ukrainian2	32	4.60	1.13
Total	193	4.78	1.12

Table 6: ANOVA results for trustworthiness ratings of each individual speaker

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	37.15	5	7.43	6.77	<.001
Within Groups	205.35	187	1.10		
Total	242.49	192			

Table 7: ANOVA effect sizes for trustworthiness ratings of each individual speaker

			95% Confidence Interval	
		Point Estimate	Lower	Upper
TrustTg	Eta-squared	.153	.053	.228
	Epsilon-squared	.131	.028	.208
	Omega-squared Fixed-effect	.130	.028	.207
	Omega-squared Random-effect	.029	.006	.050

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Table 8: Multiple comparisons for competence rating for each individual speaker (Bonferroni)

		Mean Difference			95% Confidence Interval	
(I) Speaker	(J) Speaker	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
British1	British2	-.140	.262	1.000	-.92	.64
	French1	.591	.258	.347	-.18	1.36
	French2	.528	.260	.653	-.24	1.30
	Ukrainian1	1.190*	.260	<.001	.42	1.96
	Ukrainian2	.659	.260	.182	-.11	1.43
British2	British1	.140	.262	1.000	-.64	.92
	French1	.731	.262	.087	-.05	1.51
	French2	.669	.264	.182	-.12	1.45
	Ukrainian1	1.330*	.264	<.001	.54	2.12
	Ukrainian2	.799*	.264	.043	.01	1.58
French1	British1	-.591	.258	.347	-1.36	.18
	British2	-.731	.262	.087	-1.51	.05
	French2	-.062	.260	1.000	-.84	.71
	Ukrainian1	.599	.260	.335	-.17	1.37
	Ukrainian2	.068	.260	1.000	-.71	.84
French2	British1	-.528	.260	.653	-1.30	.24
	British2	-.669	.264	.182	-1.45	.12
	French1	.063	.260	1.000	-.71	.84
	Ukrainian1	.661	.262	.186	-.12	1.44
	Ukrainian2	.130	.262	1.000	-.65	.91
Ukrainian1	British1	-1.190*	.260	<.001	-1.96	-.42
	British2	-1.330*	.264	<.001	-2.12	-.54
	French1	-.599	.260	.335	-1.37	.17
	French2	-.661	.262	.186	-1.44	.12
	Ukrainian2	-.531	.262	.660	-1.31	.25
Ukrainian2	British1	-.659	.260	.182	-1.43	.11
	British2	-.799*	.264	.043	-1.58	-.01
	French1	-.068	.260	1.000	-.84	.71
	French2	-.130	.262	1.000	-.91	.65
	Ukrainian1	.531	.262	.660	-.25	1.31

*. The mean difference is significant at the 0.05 level.

A one-way univariate analysis of variance showed a significant effect of speaker on perceived trustworthiness ($F(5,187)=6.77$, $p<.001$, $\eta 2=.153$). However, there was no significant difference between the two British-accented speakers ($p=1.00$), and also not between the two French-accented speakers ($p=1.00$) and both Ukrainian-accented speakers ($p=.660$) with regard to perceived trustworthiness ratings.

1.3 Comprehensibility x speaker

Table 9: Descriptive statistics for comprehensibility ratings of each individual speaker

	N	*M*	*SD*
British1	33	7.76	1.79
British2	31	8.29	1.51
French1	33	4.27	1.59
French2	32	5.63	2.28
Ukrainian1	32	4.41	2.09
Ukrainian2	32	5.72	1.97
Total	193	6.00	2.42

Table 10: ANOVA results for comprehensibility ratings of each individual speaker

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	451.32	5	90.26	25.24	<.001
Within Groups	668.68	187	3.58		
Total	1120.00	192			

Table 11: ANOVA effect sizes for comprehensibility ratings of each individual speaker

			95% Confidence Interval	
		Point Estimate	Lower	Upper
Comprehensibility	Eta-squared	.403	.284	.479
	Epsilon-squared	.387	.265	.465
	Omega-squared Fixed-effect	.386	.264	.464
	Omega-squared Random-effect	.112	.067	.148

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Table 12: Welchs' Robust Test of Equality of Means for comprehensibility ratings of each individual speaker

	Statistic[a]	df1	df2	Sig.
Welch	31.173	5	86.937	<.001

a. Asymptotically F distributed.

Table 13: Multiple comparisons for comprehensibility ratings of each individual speaker (Games-Howell)

					95% Confidence Interval	
(I) Speaker	(J) Speaker	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
British1	British2	-.533	.413	.789	-1.75	.68
	French1	3.485*	.416	<.001	2.26	4.71
	French2	2.133*	.509	.001	.63	3.63
	Ukrainian1	3.351*	.483	<.001	1.93	4.77
	Ukrainian2	2.039*	.467	<.001	.67	3.41
British2	British1	.533	.413	.789	-.68	1.75
	French1	4.018*	.387	<.001	2.88	5.16
	French2	2.665*	.486	<.001	1.23	4.10
	Ukrainian1	3.884*	.459	<.001	2.53	5.24
	Ukrainian2	2.572*	.442	<.001	1.27	3.87
French1	British1	-3.485*	.416	<.001	-4.71	-2.26
	British2	-4.018*	.387	<.001	-5.16	-2.88
	French2	-1.352	.489	.079	-2.80	.09
	Ukrainian1	-.134	.462	1.000	-1.49	1.23
	Ukrainian2	-1.446*	.445	.022	-2.76	-.14
French2	British1	-2.133*	.509	.001	-3.63	-.63
	British2	-2.665*	.486	<.001	-4.10	-1.23
	French1	1.352	.489	.079	-.09	2.80
	Ukrainian1	1.219	.547	.241	-.39	2.83
	Ukrainian2	-.094	.533	1.000	-1.66	1.48
Ukrainian 1	British1	-3.351*	.483	<.001	-4.77	-1.93
	British2	-3.884*	.459	<.001	-5.24	-2.53
	French1	.134	.462	1.000	-1.23	1.49
	French2	-1.219	.547	.241	-2.83	.39
	Ukrainian2	-1.312	.508	.117	-2.81	.18
Ukrainian 2	British1	-2.039*	.467	<.001	-3.41	-.67
	British2	-2.572*	.442	<.001	-3.87	-1.27
	French1	1.446*	.445	.022	.14	2.76
	French2	.094	.533	1.000	-1.48	1.66
	Ukrainian1	1.313	.508	.117	-.18	2.81

*. The mean difference is significant at the 0.05 level.

A one-way univariate Welch's analysis of variance showed a significant effect of speaker on perceived comprehensibility ($F(5, 86.94)=31.17$, $p<.001$). However, no significant difference was found between British1 and British2 ($p=.789$), French1 and French2 ($p=.079$) and Ukrainian1 and Ukrainian2 ($p=.117$) with regard to percieved comprehensibility.

Section 2

Given that no significant differences were found between the two individual speakers of a type of accent, both speakers were combined into a single accent group, representing their respective accent. Consequently, this section compared the three types of accents with respect to their scores on perceived competence, trustworthiness and comprehensibility.

2.1 Competence x type of accent

Table 14: Descriptive statistics for competence ratings of each type of accent

	N	*M*	*SD*
British accented English	64	5.26	1.01
French accented English	65	4.80	.96
Ukrainian accented English	64	4.78	1.00
Total	193	4.95	1.01

Table 15: ANOVA results for competence ratings of each type of accent

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.53	2	4.77	4.88	.009
Within Groups	185.73	190	.98		
Total	195.26	192			

Table 16: ANOVA effect sizes for competence ratings of each type of accent

			95% Confidence Interval	
		Point Estimate	Lower	Upper
CompT	Eta-squared	.049	.003	.114
	Epsilon-squared	.039	-.007	.104
	Omega-squared Fixed-effect	.039	-.007	.104
	Omega-squared Random-effect	.020	-.003	.055

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained. not rounded to zero.

Table 17: Multiple comparisons for competence ratings of each type of accent (Bonferroni)

					95% Confidence Interval	
(I) Accent_type	(J) Accent_type	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
British accented English	French accented English	.462*	.174	.026	.04	.88

	Ukrainian accented English	.481*	.175	.019	.06	.90
French accented English	British accented English	-.462*	.174	.026	-.88	-.04
	Ukrainian accented English	.019	.174	1.000	-.40	.44
Ukrainian accented English	British accented English	-.481*	.175	.019	-.90	-.06
	French accented English	-.019	.174	1.000	-.44	.40

*. The mean difference is significant at the 0.05 level.

A one-way univariate analysis of variance showed a significant effect of type of accent on perceived competence ($F(2,190)=4.88$, $p=.009$, $\eta 2=.049$). The perceived competence was higher for the speakers with a standard British accent (M=5.26, SD=1.01) than for speakers with a French accent (p=.026, Bonferroni correction; M=4.80, SD=0.96) and speakers with a Ukrainian accent (p=.019, Bonferroni correction; M= 4.78, SD=1.00). There was no significant difference between the French-accented and Ukrainian-accented speakers.

2.2 Trustworthiness x type of accent

Table 18: Descriptive statistics for trustworthiness ratings of each type of accent

	N	*M*	*SD*
British accented English	64	5.33	1.05
French accented English	65	4.70	.95
Ukrainian accented English	64	4.33	1.15
Total	193	4.79	1.12

Table 19: ANOVA results for trustworthiness ratings of each type of accent

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32.25	2	16.13	14.57	<.001
Within Groups	210.24	190	1.11		
Total	242.49	192			

Table 20: ANOVA effect sizes for trustworthiness ratings of each type of accent

			95% Confidence Interval	
		Point Estimate	Lower	Upper
TrustTg	Eta-squared	.133	.052	.219
	Epsilon-squared	.124	.042	.210

Omega-squared Fixed-effect	.123	.041	.209
Omega-squared Random-effect	.066	.021	.117

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Table 21: Multiple comparisons for trustworthiness ratings of each type of accent (Bonferroni)

(I) Accent_type	(J) Accent_type	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
British accented English	French accented English	.62808*	.18524	.003	.1807	1.0755
	Ukrainian accented English	.99219*	.18595	<.001	.5430	1.4413
French accented English	British accented English	-.62808*	.18524	.003	-1.0755	-.1807
	Ukrainian accented English	.36410	.18524	.152	-.0833	.8115
Ukrainian accented English	British accented English	-.99219*	.18595	<.001	-1.4413	-.5430
	French accented English	-.36410	.18524	.152	-.8115	.0833

*. The mean difference is significant at the 0.05 level.

A one-way univariate analysis of variance showed a significant effect of type of accent on perceived trustworthiness (F(2,190)=14,57, p<.001, η2=.133). The perceived trustworthiness was higher for the speakers with a British accent (M=5.33, SD=1.05) than for speakers with a French accent (p=.003, Bonferroni correction; M=4.70, SD=.95) and speakers with a Ukrainian accent (p<.001, Bonferroni correction; M= 4.33, SD=1.15). There was no significant difference between the French-accented and Ukrainian-accented speakers.

2.3 Comprehensibility x type of accent

Table 22: Descriptive statistics for comprehensibility ratings of each type of accent

	N	*M*	*SD*
British accented English	64	8.02	1.67
French accented English	65	4.94	2.06
Ukrainian accented English	64	5.06	2.12
Total	193	6.00	2.42

Table 23: ANOVA results for comprehensibility ratings of each type of accent

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	389.512	2	194.756	50.656	<.001
Within Groups	730.488	190	3.845		
Total	1120.000	192			

Table 24: ANOVA effect sizes for comprehensibility ratings of each type of accent

			95% Confidence Interval	
		Point Estimate	Lower	Upper
Comprehensibility	Eta-squared	.348	.239	.436
	Epsilon-squared	.341	.231	.430
	Omega-squared Fixed-effect	.340	.230	.429
	Omega-squared Random-effect	.205	.130	.273

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Table 25: Multiple comparisons for comprehensibility ratings of each type of accent (Bonferroni)

					95% Confider Interval	
(I) Accent_type	(J) Accent_type	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Up Bo
British accented English	French accented English	3.077*	.345	<.001	2.24	3.
	Ukrainian accented English	2.953*	.347	<.001	2.12	3.
French accented English	British accented English	-3.077*	.345	<.001	-3.91	-2
	Ukrainian accented English	-.124	.345	1.000	-.96	.
Ukrainian accented English	British accented English	-2.953*	.347	<.001	-3.79	-2
	French accented English	.124	.345	1.000	-.71	.

*. The mean difference is significant at the 0.05 level.

A one-way univariate analysis of variance showed a significant effect of type of accent on perceived comprehensibility ($F(2,190)=50.66$, $p<.001$, $\eta 2=.348$). The perceived comprehensibility was higher for the speakers with a British accent (M=8.02, SD=1.67) than for speakers with a Ukrainian accent ($p<.001$, Bonferroni correction; M=5.06, SD=2.12) and

speakers with a French accent (p<.001, Bonferroni correction; M=4.94, SD=2.06). There was no significant difference between the French-accented and Ukrainian-accented speakers.

Section 3

In the third section, participants' familiarity with the various types of accents are assessed to determine the accuracy with which listeners could correctly identify the nationality of the accented speakers.

Familiarity x type of accent

Table 26: Crosstabulation comparing participants' familiarity with the types of accent

			Accent_type			
			British accented English	French accented English	Ukrainian accented English	Total
Familiarity	Incorrect	Count	9_a	19_a	64_b	92
		% within Accent_type	14.1%	29.2%	100.0%	47.7%
		Standardized Residual	-3.9	-2.1	6.1	
	Correct	Count	55_a	46_a	0_b	101
		% within Accent_type	85.9%	70.8%	0.0%	52.3%
		Standardized Residual	3.7	2.1	-5.8	
	Ukrainian/French speaker identified as British	Count	0_a	0_a	0_b	0
		% within Accent_type	0.0%	0.0%	0.0%	0%
		Standardized Residual	-.6	-.6	-.6	
Total		Count	64	65	64	193
		% within Accent_type	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Accent_type categories whose column proportions do not differ significantly from each other at the .05 level.

- Note: Pearson Chi-square=108.09, df=2, p<.001, N=193

Table 27: symmetric measures of participants' familiarity with the types of accent

	Value	Approximate Significance
Phi	.748	<.001

Nominal by Nominal	Cramer's V	.748	<.001
N of Valid Cases		193	

A chi-square test showed a significant relation between type of accent and familiarity with the accent ($\chi 2(2)=108.09$, $p<.001$). This relation was strong (Cramer's V=.748). Participants who listened to the Ukrainian-accented english audio were not able to guess the nationality of the speaker correctly (0%) whilst participants who listened to the British-accented English (85.9%) and the French-accented english audio(70.8%) were able to correctly identify the speaker's nationality. In addition, not one participant guessed the French-accented or Ukrainian-accented speaker as being British.

Section 4

In the last section, the influence of personality were tested by means of a correlation test for each dimension of personality against the ratings participants gave for competence, trustworthiness and comprehensibility.

Table 28: Correlations between the personality dimensions and ratings of perceived competence, trustworthiness and comprehensibility

		TrustwT	CompT	Comprehensibility
Honesty_Humility	Pearson Correlation	.212	.104	.078
	Sig. (2-tailed)	.006	.182	.318
	N	167	167	167
Emotionality	Pearson Correlation	.182	.077	.162
	Sig. (2-tailed)	.019	.322	.037
	N	167	167	167
Extraversion	Pearson Correlation	-.011	-.032	-.050
	Sig. (2-tailed)	.889	.681	.517
	N	167	167	167
Agreeableness	Pearson Correlation	.041	.011	.005
	Sig. (2-tailed)	.600	.891	.954
	N	167	167	167
Conscientiousness	Pearson Correlation	.105	.020	.095
	Sig. (2-tailed)	.177	.798	.222
	N	167	167	167
Openness_to_experience	Pearson Correlation	.160	.099	.035
	Sig. (2-tailed)	.039	.205	.656
	N	167	167	167

A significant positive correlation was found between the honesty-humility dimension of personality and perceived trustworthiness ratings (r=.21, p=.006, N=167). The perceived trustworthiness increased with the honesty-humility scores.

In addition, a significant positive correlation was found between the emotionality dimension of personality and perceived trustworthiness ratings (r=.18, p=.019, N=167) and perceived comprehensibility (r=.16, p=.037, N=167). The perceived trustworthiness and comprehensibility ratings increased with the emotionality scores.

Lastly, a significant positive correlation was found between the openness to experience dimension of personality and perceived trustworthiness ratings (r=.16, p=.039, N=167). The perceived trustworthiness increased with the openness to experience scores.

No other significant correlations were found between the dimensions of personality and the perceived competence, trustworthiness and comprehensibility ratings given by listeners.

Brief overview of the results

In essence, standard British-accented speakers were rated highest on perceived competence and trustworthiness compared to non-standard French-accented and Ukrainian-accented speakers. In terms of comprehensibility, standard British-accented speakers were also rated highest, with French-accented and Ukrainian-accented scoring notably and similarily lower. In addition, participants scoring high on the honesty-humility and openness to experience dimension tended to also give higher ratings on perceived trustworthiness ratings. High scorers on the emotionality dimension also tended to give high perceived trustworthiness and comprehensibility ratings.

Discussion

The aim of the present study was to explore to what extent accented speech, distinguishing between native and nonnative speakers, influences perceptions of physicians' competence, trustworthiness and comprehensibility, and whether correlates to the listeners' personality. In line with previous research (Baquiran & Nicoladis, 2019; La Veist & Nuru-Jeter, 2002; Lev-Ari & Keysar, 2010; Munro & Derwig, 1995; Tsurutani, 2012), the findings suggest that in all instances, the native speaker is rated more favourably compared to non-native accented speakers. Specifically, doctors with a standard British English accent were perceived as more competent, trustworthy and comprehensible than speakers with a non-standard French or Ukrainian accent, whilst there was no significant difference between the French-accented and Ukrainian-accented speakers.

Distinguishing itself from prior studies, this study deliberately involved participants that did not share ethnic or linguistic similarities with the speakers from the audio fragments, accounting for the influence of patients favouring doctors of the same ethnicity (LaVeist & Nuru-Jeter, 2002). The findings indicate a clear pattern: native speakers are favoured. While participants did not consistently succeed in accurately identifying the accent, they did consistently identify the Ukrainian- and French-accented speakers as non-British (table 26). This shows that participants clearly differentiate between native and non-native speakers. Therefore, the results solely reflect attitudes toward non-native accents in general. It can be concluded that regardless of the specific type of accent, the mere presence of a non-native accent impacts listeners' perceptions. It underscores a bias where non-native speakers are consistently rated less favourably compared to native speakers. In other words, it is not the specific French or Ukrainian accent, but rather the effect of being identified as non-native that results in the diminished evaluations of the Ukrainian- and French-accented speakers.

This pattern persists across various settings. For instance, non-native accents were consistently evaluated less favourable than native accents in contexts such as job interviews and applications (Deprez-Sims & Morris, 2010, Deprez-Sims & Morris, 2013; Hosoda & Stone-Romero, 2010), classroom environments (Rubin & Smith, 1990), and in customer service (Hill & Tombs, 2011). This suggests that bias against non-native accents is not context-dependent, hinting at a potentially universal perception of accented speech, where individuals simply prefer native accents.

Although there were significant differences between the accent groups, with the standard British-accented doctor consistently being perceived more positively than the

Ukrainian-accented or French-accented doctor, it should be noted that all accents scored relatively positive. Each accent group scored above average in terms of competence, trustworthiness and comprehensibility. Interestingly, the standard British-accented speaker was not rated exceptionally high by listeners, and the mean differences were not substantial. In addition, the vast majority of the listeners would be comfortable being helped by the doctor, regardless of the doctor's accent (Appendix C). Therefore, accent does matter, but only to some extent; although non-native speakers were rated lower, it did not deter people from seeking assistance they needed.

Furthermore, researchers attempted to investigate the influence of the listener on these perceived competence, trustworthiness and comprehensibility ratings. The results showed a significant correlation between certain personality dimensions and the ratings given by participants, particularly in assessments of perceived trustworthiness. This can be explained by previous research that demonstrates that an individual's perception of another person's trustworthiness is more influenced by their personal characteristics than by that person's actual, intrinsic trustworthiness (Bergman et al., 2010). In other words, individual personality characteristics predominantly shape judgments of others' perceived trustworthiness.

Firstly, a positive correlation was found where participants with high scores on the emotionality dimension also tended to give high ratings with regard to perceived trustworthiness. This might not be a surprising result, as people with high scores on emotionality experience anxiety and fear of physical dangers, which could make them more likely to trust their doctors compared to those who score lower on emotionality and therefore less fear of physical danger (Lee & Ashton, 2004). As stated by Ashton and Lee (2007), high scorers on emotionality engage in help-seeking behaviour. In essence, it is quite plausible that individuals with anxiety and fear for physical dangers may seek out doctors as a source of reassurance, which can foster trust in their doctors.

Secondly, participants who scored high on the honesty-humility dimension of personality also tended to assign higher ratings on perceived trustworthiness to doctors. This relation may be attributed to the inclination of high scorers on honesty-humility to exhibit modesty, viewing themselves as ordinary individuals without a sense of superiority and without a claim to special treatment (Lee & Ashton, 2004). Moreover, individuals commonly tend to trust individuals who are perceived as authoritative figures, especially in contexts where expertise and knowledge are valued (Cialdini, 2021). Hence listeners with high honesty-humility scores may perceive doctors as more trustworthy because of their lack of

perceived superiority over others, thereby possibly respecting the authority and knowledge of the doctor.

Unexpected findings revealed positive correlations between emotionality and perceived comprehensibility, as well as between openness to experience and perceived trustworthiness. Understanding these relationships and offering plausible explanations requires further investigation. Thus future research is essential to further understand how listener personality influences listeners' perceptions and evaluation patterns. Specifically, future studies should focus on the subcategories of the emotionality and honesty-humility dimensions within the HEXACO-60 personality test. In particular, the subcategories 'fearfulness' and 'anxiety' of the emotionality dimension, and the 'modesty' category of the honesty-humility dimension should be studied to confirm or refute the possible explanations provided above.

When acknowledging the limitations of this study, it should be noted that the sample of this study consists exclusively of highly-educated Dutch students, limiting the generalizability of the findings. Specifically, highly-educated students might score differently on certain dimensions of personality compared to other populations. For instance, previous research suggest that academic intelligence is related to the conscientiousness dimension of personality. It has been stated that academic intelligence is often attributed to productive, well-organized and intellectually efficient individuals; traits that align with the conscientiousness dimension (Sternberg et al., 1981; McCrae & Costa, 1985). Therefore, it can be expected that highly-educated students overall might score higher on conscientiousness.

Moreover, Costa and McCrae (1992) discussed that openness to experience is associated with a range of creative and intellectual activities, which are more prevalent among individuals pursuing higher education. Students might also be more open-minded or familiar with accented speech due to their increased likelihood of encountering international peers and diverse speech patterns. This notion is supported by Gurin et al. (2002), who found that classroom diversity and informal interactions with peers from different ethnic backgrounds positively influence students' openness to diversity. To conclude, students represent a specific group characterized by particular educational experiences that encourage the exploration of new ideas and perspectives. Consequently, individuals with different educational backgrounds or from different age groups might score differently or more variably on personality tests, potentially leading to different ideas on accentedness and perceived competence, trustworthiness and comprehensibility.

Additionally, participants' previous experience in the medical field was not taken into consideration. However, individuals with prior medical experience may have developed biases or expectations based on their personal experiences. For instance, an individual who has undergone detrimental treatment might be less willing to engage with an accented-doctor, as it may require more effort to understand them; something the patient might not have the energy for. Furthermore, medical students, with their specific training and knowledge, might also be biased in evaluating the doctors, holding them to higher standards based on their understanding of how doctors should interact with patients. Conversely, medical students might be more lenient towards doctors, empathizing with the pressures doctors face and thus offer more forgiving statements. This can be underscored by previous research of Morrison and Murray (1996), who observed that increased knowledge and engagement with a particular topic correlates with a more positive attitudes from medical students. Moreover, Henderson et al. (2002) noted that fifth-year medical students portray a more positive attitude towards doctors compared to first year students, highlighting how accumulating experience as a medical student influences perceptions towards doctors due to the comprehensive training they receive. Therefore, it is important to consider experience in the medical field in future research.

Furthermore, while the mean differences between speakers of the same accent were minimal across the competence and trustworthiness dimensions, they varied significantly in the comprehensibility dimension. In essence, there were substantial mean differences between the first and second French-accented speaker, as well as the first and second Ukrainian-accented speaker. Although experts evaluated all accents as representative, listeners did not find them equally comprehensive. This suggests that individual variations in accent delivery among speakers of the same accent could have influenced listeners' perceptions of comprehensibility. These differences could also be attributed to other factors, such as the speaker's speed or audio quality. Future studies should aim to minimize the potential confounding effects of individual differences in speech audios to reduce this source bias.

Another limitation is the discrepancy in the number of participants used for analysing the influence of listeners' personality compared to those used to analyse the perceived competence, trustworthiness and comprehensibility of the doctor. Since the questionnaire was administered online, participants were able to leave at any point. Despite stating the approximate duration of the questionnaire, some participants exited before completing the personality test, resulting in usable data from only 167 participants for the analysis of listener personality. This led to unequal numbers of participants per accent group, preventing

researchers from testing an interaction effect between the type of accent and listeners' personality. Future studies should consider implementing strategies such as reminders to ensure higher completion rates.

This research has affirmed the widespread bias against non-native accented speech, while also providing new insights into the impact of listeners' personalities. However, this effect should be studied more extensively by examining the subdimensions of the HEXACO-60 personality test. This study serves as a foundation for future research that focuses on the role of the listener in making evaluations. More extensive research could inform the development of communication strategies aimed at reducing the impact of listener personality on accent perception.

Conclusion

From the above data, it can be concluded that doctors with a standard British accent consistently received higher ratings from listeners in terms of perceived competence, trustworthiness and comprehensibility compared to doctors with non-standard French or Ukrainian accents, thus confirming the first hypothesis. In addition, a clear pattern arose in which participants clearly distinguished between native and non-native speakers of English. Consistent with previous research, the results highlight that the mere presence of a non-native accent leads listeners to attribute less favourable aspects to the speaker, in comparison to speakers with a native accent. Within the realm of accentedness, a bias against non-standard, non-native accented-speech had already been discovered, which this data further supports.

Moreover, it has been demonstrated that personality does affect participants' evaluations. High scorers on the emotionality, openness to experience and honesty-humility dimensions tended to rate doctors higher on perceived trustworthiness, partially supporting the second hypothesis. In addition, participants that scored high on the emotionality dimensions also gave higher ratings on perceived comprehensibility. This confirms that intrinsic characteristics of the listener also play a role in shaping evaluations.

Appendices

Appendix A: questionnaire used to measure doctors' perceived competence, trustworthiness and comprehensibility by listeners (Brockway, 1978; Derwig, 1995; Hendriks et al., 2014)

1. Wat is uw nationaliteit?
   - Nederlands
   - Anders: …
2. Wat is uw moedertaal
   - Nederlands
   - Anders:…
3. Bent u een HBO/WO student?
   - Ja
   - Nee
4. Wat is uw leeftijd?
5. Wat is uw geslacht?
6. Hoe beoordeelt u uw eigen taalvaardigheid in het Engels op een schaal van 1 tot 7 (waarbij 1= heel slecht en 7=heel goed)?

1	2	3	4	5	6	7

U zult nu een aantal schaalvragen worden gesteld met betrekking tot het audio fragment. Beoordeel de volgende stelling in hoeverre u er mee eens bent:

	1=Helemaal mee oneens	*2=Mee oneens*	*3=Een beetje mee oneens*	*4=Neutraal (noch mee eens noch mee oneens)*	*5=Een beetje mee eens*	*6=Mee eens*	*7=Helemaal mee eens*
7. Ik vind de dokter betrouwbaar	○	○	○	○	○	○	○
8. Ik vind de dokter intelligent	○	○	○	○	○	○	○
9. Ik vind de dokter bekwaam	○	○	○	○	○	○	○
10. Ik vind de dokter hardwerkend	○	○	○	○	○	○	○

11. Ik vind de dokter goed opgeleid	○	○	○	○	○	○	○
12. De dokter stelde mij op mijn gemak	○	○	○	○	○	○	○
13. De dokter sprak duidelijk en was makkelijk te begrijpen	○	○	○	○	○	○	○
14. De dokter leek gevoelig voor mijn zorgen	○	○	○	○	○	○	○
15. De dokter gaf mij niet voldoende informatie over mijn gezondheidsproblemen	○	○	○	○	○	○	○
16. De dokter was grondig en volledig	○	○	○	○	○	○	○
17. Over het algemeen ben ik tevreden met de dokter	○	○	○	○	○	○	○

18. U zult nu een schaalvraag worden gesteld met betrekking tot de verstaanbaarheid van de spreker:

1	2	3	4	5	6	7	8	9

De dokter is makkelijk verstaanbaar De dokter is moeilijk verstaanbaar

19. Uit welk land denkt u dat de spreker afkomstig is?
20. De dokter waar u zojuist naar heeft geluisterd komt uit (Oekraïne, Frankrijk, het Verenigd Koninkrijk). Zou u het goed vinden om door een dokter uit (Oekraïne, Frankrijk, het Verenigd Koninkrijk) geholpen te worden?
    - Ja
    - Misschien ..
    - Nee
21. Heeft u nog andere opmerkingen?

Appendix B: HEXACO-60 personality test (Ashton & Lee, 2009)

1= helemaal mee oneens 2= mee oneens 3= neutraal (noch mee eens, noch mee oneens)

4= mee eens 5= helemaal mee eens

1 _____ Ik zou me vervelen bij een bezoek aan een kunstgalerie.

2 _____ Ik maak vooraf plannen en regel alvast zaken om te vermijden dat ik op het laatste moment nog dingen moet doen.

3 _____ Ik houd zelden een wrok tegen iemand, zelfs niet als ik erg slecht behandeld ben.

4 _____ Alles bij elkaar heb ik wel een tevreden gevoel over mezelf.

5 _____ Ik zou bang worden als ik in slecht weer zou moeten reizen.

6 _____ Ik zou niet vleien om op het werk opslag of promotie te krijgen, zelfs al zou het succes hebben.

7 _____ Ik kom graag meer te weten over de geschiedenis en politiek van andere landen.

8 _____ Ik span me vaak tot het uiterste in als ik een doel tracht te bereiken.

9 _____ Mensen vertellen me soms dat ik te kritisch op anderen ben.

10 _____ Ik geef zelfden mijn mening in groepsbijeenkomsten.

11 _____ Ik maak me soms zorgen over onbenulligheden.

12 _____ Als ik niet gepakt zou worden, dan zou ik er geen probleem mee hebben om een miljoen Euro te stelen.

13 _____ Ik zou graag iets kunstzinnigs doen, zoals een boek schrijven, een lied componeren of een schilderij maken.

14 _____ Als ik aan iets werk, besteed ik weinig aandacht aan kleine details.

15 _____ Mensen vertellen me soms dat ik te koppig ben.

16 _____ Ik heb liever een baan waarin men veel met andere mensen omgaat dan één waarin men alleen dient te werken.

17 _____ Na een pijnlijke ervaring heb ik iemand nodig om me te troosten.

18 _____ Veel geld bezitten vind ik onbelangrijk.

19 _____ Ik vind het tijdverlies om aandacht te besteden aan radicale ideeën.

20 _____ Ik neem beslissingen op basis van ‘hier-en-nu’ gevoelens in plaats van zorgvuldig beraad.

21 _____ Mensen vinden me een heethoofd.

22 _____ De meeste dagen voel ik me blij en optimistisch.

23 _____ Ik voel tranen opkomen als ik anderen zie huilen.

24 _____ Ik vind dat ik meer recht op respect heb dan de gemiddelde persoon.

25 _____ Als ik de gelegenheid had, zou ik graag een klassiek concert bijwonen.

26 _____ Ik haal me soms problemen op de hals omdat ik slordig ben.

27 _____ Mijn houding ten aanzien van mensen die mij slecht behandeld hebben is “vergeven en vergeten”.

28 _____ Ik heb het gevoel dat ik een impopulair persoon ben.

29 _____ Als het gaat om fysiek gevaar, ben ik een angsthaas.

30 _____ Als ik iets van iemand wil, lach ik om diens slechte grappen.

31 Ik heb nooit met veel plezier in een encyclopedie gekeken.

32 Ik verricht zo min mogelijk werk, maar net genoeg om rond te komen.

33 Ik heb de neiging andere mensen mild te beoordelen.

34 Als ik anderen ontmoet, ben ik meestal diegene die het contact op gang brengt.

35 Ik maak me veel minder zorgen dan de meeste mensen.

36 Ik zou nooit ingaan op een poging tot omkoping, zelfs niet als het om een erg hoog bedrag ging.

37 Mensen vertellen me vaak dat ik een levendige verbeelding heb.

38 Ik probeer altijd zo nauwkeurig mogelijk te werken, zelfs al kost het me extra tijd.

39 Ik ben gewoonlijk vrij flexibel in mijn opvattingen als mensen het met mij oneens zijn.

40 Het eerste dat ik altijd doe als ik ergens nieuw ben, is vrienden maken.

41 Moeilijke situaties kan ik aan zonder emotionele steun van anderen nodig te hebben.

42 Ik zou veel plezier beleven aan het bezit van dure luxe goederen.

43 Ik houd wel van mensen met onconventionele ideeën.

44 Ik maak veel fouten omdat ik niet nadenk voordat ik iets doe.

45 De meeste mensen hebben de neiging sneller boos te worden dan ik.

46 De meeste mensen zijn levenslustiger en dynamischer dan ik over het algemeen ben.

47 Ik raak erg geëmotioneerd als iemand die me na staat voor een lange tijd weg gaat.

48 Ik wil dat mensen weten hoe belangrijk ik ben.

49 Ik beschouw mezelf niet als een artistiek of creatief type.

50 Mensen noemen me vaak een perfectionist.

51 Zelfs als mensen veel fouten maken, zeg ik zelden iets negatiefs.

52 Soms heb ik het gevoel dat ik een waardeloos persoon ben.

53 Zelfs in crisissituaties blijf ik rustig.

54 Ik zou niet net doen alsof ik iemand mag om te zorgen dat die persoon mij een dienst bewijst.

55 Ik vind het saai om over filosofie te discussiëren.

56 Ik doe liever dingen spontaan dan vast te houden aan een plan.

57 Als mensen mij vertellen dat ik het mis heb, is mijn eerste reactie dit aan te vechten.

58 Als ik met andere mensen samen ben, ben ik vaak de woordvoerder van de groep.

59 Ik raak niet snel geëmotioneerd, zelfs niet in situaties waarin anderen erg sentimenteel worden.

60 Ik zou in de verleiding komen om vals geld te gebruiken als ik er zeker van was dat ik er mee weg zou komen.

Appendix C: Answers to question 20 of the questionnaire

Table 29: Willingness to be helped by the doctor participants listened to

		Frequency	Percent
Valid	Yes	171	88.6
	Maybe	17	8.8
	No	2	1.0
	Total	190	98.4
Missing		3	1.6
Total		193	100.0

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