Sounding Hot or Not: The Perception of Charisma in Female Speech in General American and Standard British Accents

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Abstract

The current research looked into charisma perception of female speech, as well as how accent influences this. Additionally, the effect of rater gender on charisma perception was considered. The concept of charisma is still young, which means that there is often confusion when it comes to establishing a clear, empirical definition. For the purposes of this project, 4 attributes were chosen based upon previous research: ‘enthusiastic’, ‘convincing’. ‘confident’ and ‘interesting’. It was investigated whether Dutch raters preferred a low prosody, which consists of a lower pitch and a slower speaking rate, or a high prosody. which consists of a higher pitch and a faster speaking rate. Using an online questionnaire, participants were presented with speech fragments and asked to rate them on the 4 mentioned attributes. The stimuli were from 8 different female speakers, 4 with a General American (GA) accent and 4 with a Standard British (SB) accent. Per speaker, a low prosody and a high prosody condition was created, yielding 16 stimuli in total. Participants were asked to rate each fragment on a scale of 1-10 for every attribute. The analysis was done using linear mixed-effects models. It was found that prosody had a significant effect on all attributes, but for ‘convincing’ and ‘confident’ there was also a 3-way interaction between accent, prosody and rater gender. Overall, the high prosody condition was preferred, except by the male raters when judging ‘confident’. Additionally, the SB accent was preferred by the female raters for ‘convincing’ and ‘confident’. This was also true for the male raters, except for ‘convincing’, where they preferred a GA accent. This indicates that prosody affected all attributes, while accent only affected ‘convincing’ and ‘confident’. This suggests that accent has a less significant effect on charisma perception than prosody, but that there is an effect nonetheless.

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Introduction

The concept of charisma, as a quality an individual can possess, is relatively young. It was first defined by the philosopher Max Weber (1968). However, it is likely that the origin of the word comes from Ancient Greek *charis* (Antonakis et al., 2016). The word was used to describe leadership that led to great power. It also meant gratitude, excitement, beauty, and charm (Antonakis et al., 2016). Though the word 'charisma' itself was not used by the Greeks, Aristotle's theory of rhetoric essentially describes the qualities a speaker needs in order to be charismatic (Antonakis et al., 2016). In order to be persuasive, a speaker needs *ethos*, *pathos* and *logos*. *Ethos* refers to the character of the speaker, they must be trustworthy. Appealing to the emotions of the audience is *pathos*, and *logos* refers to the use of rational arguments (Gutnyk, Niebuhr & Gu, 2021). Weber's (1968) ideas were developed further by psychologists, sociologists, and political scientists (Antonakis et al., 2016). It is likely because of this that research into charisma often focuses on political speakers or entrepreneurs (Weber, 1968; Hirschberg & Rosenberg, 2005; Niebuhr, Tegtmeier & Brem, 2017).

Recently there has been more research into the linguistic properties of charisma (Niebuhr, Skarnitzl & Tylecková, 2018; Yang et al., 2020). This is because it is important to understand what makes a speaker charismatic. Public figures such as politicians have a need to be charismatic: this has a large impact on their support. For example, consider Steve Jobs, Mark Zuckerberg, and the way they influence the public through their speeches. Steve Jobs is considered a charismatic speaker, while this is not the case for Mark Zuckerberg (Niebuhr, Thumm & Michalsky, 2018). The study of charisma not only includes lexical properties, but also a so-called speaker's 'delivery'. This delivery contains everything a speaker conveys to a listener except for the words themselves (Brem & Niebuhr, 2021). Charisma is often seen as a

magical or mystical property, but it is in fact a learnable skill (Niebuhr, Tegtmeier & Brem, 2017). Charismatic speakers alter their pitch level, pitch variation, loudness of speech, speech rate, and articulate clearly (Rosenberg & Hirschberg, 2009; Niebuhr, Tegtmeier & Brem, 2017). With an understanding of the prosodic features of charisma comes the ability to produce speech that is more charismatic.

Before the prosodic features of charisma can be studied, a clear and understandable definition of charisma must be established. As it is a relatively young term, there is sometimes confusion as to its exact definition. Much of the research thus far has focused only on the effects of charismatic speakers rather than what inherently makes the speaker charismatic (Antonakis et al., 2016). A number of research papers have created large lists of attributes that could contribute to charisma, and had participants indicate which aspects they thought were relevant to speakers that were agreed to be charismatic (Rosenberg & Hirschberg, 2005; Hirschberg & Rosenberg, 2009). As such, the current paper will give an overview of some of the research into a common definition of charisma and establish which attributes will be used in this experiment.

Additionally, there is a body of research studying the perception of charisma in different cultures (Biadsy et al., 2008; D'Errico et al., 2013; Gutnyk, Niebuhr & Gu, 2021). What is judged as charismatic in one country might not be perceived as charismatic in another country. This can refer to the lexical content of the speech, but also the prosodic elements expressed. It is also possible that listeners are influenced by the accent the speaker uses. Most people can identify an accent they enjoy listening to. However, it is possible that this enjoyment stems from the charisma the speaker exudes, rather than the accent itself. As such, it is important to research the effect accent has on charisma perception and what the effects of accent and its interplay with prosody are.

Much of the existing charisma research has only included male speakers in its analysis (Hirschberg & Rosenberg 2009; Niebuhr, Thumm & Michalsky, 2018), even though there is reason to believe that the prosodic features female speakers use in charismatic speech are different (Yang, 2020; Brem & Niebuhr, 2021). This paper seeks to understand how female speakers use prosodic features in their speech to sound charismatic, as well as how different accents from languages non-native to the listener affect charisma perception.

Literature Review

Charisma: Problems with Defining it and its Attributes

There has long been an ongoing discussion about the defining properties of charisma. It is generally agreed that a charismatic speaker is easier to identify than define (Hirschberg & Rosenberg, 2005). On the definition of charisma Max Weber (1968) is often quoted: "charisma means that an extraordinary, at least not generally available, quality adheres to a person" (p. 194). This explains the difficulty we have with defining charisma; what is an extraordinary and not generally available quality?

Antonakis et al. (2016) point out that scientific methods studying charisma have yet to adhere to a clear definition of the term. Many research papers (Hirschberg & Rosenberg, 2005; Biadsy et al., 2008) mention the definition by Weber (1968). However, his proposed definition is not clear or defined enough to use in empirical studies. Antonakis et al. (2016) argue that a construct can only be researched if the construct that is studied is properly defined, stating that: "useful definitions would require the construct […] to be independent of its effects" (p. 302). When defining charisma, we tend to think about the effect a charismatic speaker has on people, rather than what exactly makes a speaker charismatic. The alternative definition proposed by Antonakis (2016) is: "charisma is values-based, symbolic and emotion-laden leader signalling" (p. 304). This is a definition that focuses on the construct of

charisma itself. For the purposes of the current research, the focus will be on the type of signalling conveyed by the speaker through prosodic features, rather than lexical features.

Keeping the debate concerning definitions in mind, it is important to establish a definition that can be used for the purposes of the current research. Specifically, a definition that allows respondents to understand what is being researched. Using the term 'charisma' itself leads to heterogenous responses from participants (Brem & Niebuhr, 2021). Adapting the definition of charisma into different attributes that a speaker can possess is easier for respondents to understand. Many studies have therefore chosen to study which individual attributes may contribute to charisma, to aid in finding a shared definition (Hirschberg & Rosenberg, 2009), but also to make it clear to participants what exactly to judge speakers on (Brem & Niebuhr, 2021). Brem & Niebuhr (2021) chose to use 'convincing', 'passionate' and 'charming', and asked participants to rate speeches based on these attributes. 'Convincing' and 'passionate' worked well enough to rate charisma, but not 'charming'. The results of the ratings for 'charming' were inconclusive. Therefore, 'charming' was not analysed, but only 'convincing' and 'passionate'. The other attributes represented the idea of charisma well and also correlated with each other (Brem & Niebuhr, 2021).

The grounds for choosing these attributes came from Rosenberg & Hirschberg (2009). Research was conducted into the shared definition of charisma between respondents. Although difficult to define, every individual can identify a charismatic speaker (Rosenberg & Hirschberg, 2009). Therefore, there must be a shared definition among raters. Respondents were asked to rate speakers on 23 different attributes[1]. The results indicated that 'enthusiastic', 'charming', 'persuasive', 'passionate', 'convincing' and 'boring' were the attributes most strongly correlated with high ratings of charisma. All these attributes were

[1] Charismatic, angry, spontaneous, passionate, desperate, confident, accusatory, boring, threatening, informative, intense, enthusiastic, persuasive, charming, powerful, ordinary, tough, friendly, knowledgeable, trustworthy, intelligent, believable, convincing, and reasonable (p. 643, Rosenberg & Hirshberg, 2009)

positively correlated, except ‘boring’, which was negatively correlated (Rosenberg & Hirschberg, 2009). This means that if a speaker has a high score for ‘boring’, they are not seen as very charismatic. The traits ‘desperate’, ‘threatening’, ‘accusatory’ and ‘angry’ did not show a strong correlation with charisma (Rosenberg & Hirschberg, 2009). This suggests that these do not have an effect on the judgment of charisma, so a speaker can still be seen as charismatic even if they are desperate, threatening, accusatory or angry.

In turn, the attributes studied by Rosenberg & Hirshberg (2009) came from Tuppen (1974). In this study, research was conducted into what makes a communicator seem credible. It is here that charisma is first mentioned as a term “which has recently acquired popularity” (p. 257). 101 participants rated 10 fictitious communicators on 64 rating scales. All communicators were described with character sketches. 4 of the communicators were described to be delivering a persuasive message (Tuppen, 1974). There were 36 7-point Likert scales, and 28 bipolar adjective scales for the participants to rate. The results revealed a number of clusters, in which the attributes that the participants had rated were grouped. One of these clusters was named *charisma.* This was defined as: “a communicator who is thought of as convincing, reasonable, right, logical, believable, intelligent, respected in their opinion, whose background is admired, and in whom the reader has confidence” (p. 257). It was also found that charisma strongly correlated with a change in attitude, meaning that a charismatic speaker is able to bring about a change in attitude in the listener (Tuppen, 1974). *Charisma* was also the only communicator variable of statistical significance in the study. Tuppen (1974) helped introduce the concept of charisma from sociological theory into communication theory. The research following this study allowed for a more empirically substantiated definitions of charisma, as presented by Antonakis et al. (2016) in the form of a clear definition focusing on the construct itself rather than its effects. Furthermore, Rosenberg & Hirschberg (2009) and Brem & Niebuhr (2021) used speaker attributes to define charisma,

discovering that charismatic individuals tend to be seen as enthusiastic and convincing, whilst not being boring.

Prosodic features of charisma

Pitch level

The lexical definition of charisma that will be kept in mind in this paper is proposed by Antonakis et al. (2016): signalling that is "values-based, symbolic and emotion-laden" (p. 304). Aside from this definition, there is also a prosodic definition of charisma. Or at least, there is research attempting to find a prosodic definition of charisma (Rosenberg & Hirschberg, 2009; Niebuhr, Tegtmeier & Brem, 2017; Yang et al., 2020; Niebuhr & Skarnitzl, 2021). When describing charisma, usually something is mentioned along the lines of: "it is not about what is said, it is about how it is said" (p. 3, Hirschberg & Rosenberg, 2005). This can also refer to the speaker's 'delivery', which encompasses everything a speaker conveys to the listener except for the lexical content (Brem & Niebuhr, 2021). This alludes to the importance of prosody in charismatic speech. An experiment was conducted where 8 speakers of American English listened to a segment of speech and simultaneously indicated how much they agreed with 26 given statements on a 5-point scale. In total, 45 segments of speech were included. The material came from 9 political candidates vying for the nomination for president from the Democratic Party (Hirschberg & Rosenberg 2005). The 26 statements used are the same as in Rosenberg & Hirschberg (2009). In the analysis, the standard deviation and the mean f0 were compared to charisma ratings. F0 refers to fundamental frequency, which is the quantitative measurement of pitch (Brown & Miller, 2013). Pitch refers to the perception of f0. It was found that the perceived charisma was greater when the mean and the standard deviation of f0 were greater (Hirschberg & Rosenberg, 2005). This suggests that a higher pitch was seen as more charismatic, as well as a higher variety in pitch. A higher pitch signals a more enthusiastic speaker (Hirschberg &

Rosenberg, 2005), and because a charismatic speaker is enthusiastic, it follows that a higher pitch is seen as more charismatic. In addition, measurements were conducted into the f0 variation within phrases. Phrases where there was considerable variation in maximum pitch were seen as more charismatic than phrases where there was less variation (Hirschberg & Rosenberg, 2005).

To further investigate the relationship between pitch and charisma, a comparison between Steve Jobs (SJ) and Mark Zuckerberg (MZ) was used to investigate the effect of a higher pitch and the shaping of pitch accents (Niebuhr, Thumm & Michalsky, 2018). The goal of the research was to establish whether a general increase of f0 contributes to charisma perception, or if the use of more high pitch accents does this. Specifically, whether the shape of the pitch accent contributes to charisma perception as well. SJ is seen as an arguably more charismatic speaker than MZ (Niebuhr, Thumm & Michalsky, 2018). As such, it was expected that SJ would have a higher mean f0 level or use more high pitch accents than MZ. This was tested by having 98 participants rate the speaker's charisma, estimate the speaker's experience in management, and estimate the likelihood of the participants themselves invest money in the speaker's company. The results confirmed that SJ is regarded as a more charismatic speaker than MZ. SJ used pitch accents that were shaped differently. They took on a more convex shape, as well as having a slower rise (Niebuhr, Thumm & Michalsky, 2018). This contributes to a higher f0 level because the speaker spends more time in the peak of the pitch accent. The pitch accents MZ used were more peaked and less convex than SJ, which suggests a more abrupt change in pitch rather than a gradual one, and also means that the amount of time spoken with a high f0 is less. Therefore, SJ was considered the more charismatic speaker (Niebuhr, Thumm & Michalsky, 2018). These results suggest that a raised f0 level, in addition to a convex shape of the higher pitch accents, both contribute significantly to the perception of charisma.

Speaking rate

A faster speaking rate also influences charisma perception (Hirschberg & Rosenberg, 2005). Speaking rate can be measured as the amount of words produced in a chosen time frame, such as one minute. The paper by Hirschberg & Rosenberg (2005) was one of the first to mention a faster speaking rate as a prosodic element of charisma. However, upon further examination it was discovered that it might not necessarily be a faster speaking rate that signals charisma, but rather a slower speaking rate that signals hesitation or doubt (Rosenberg & Hirschberg, 2009). Speaking rate variation within a phrase was not correlated with charisma (Rosenberg & Hirschberg, 2009), which suggests that a consistent speaking rate is preferable.

Furthermore, Brem & Niebuhr (2021) conducted research on charisma perception in male and female speakers. One of the parameters researched was speaking rate. The stimuli for the experiment were manipulated in such a way that two prosody conditions were created, a low one, in which speakers spoke 10% slower, and a high one, in which speakers spoke 10% faster (Brem & Niebuhr, 2021). The male speakers were all judged to be more charismatic in the higher prosody condition, which means that a faster speaking rate was preferred for them. Of the female speakers, two of them were judged to be more charismatic while speaking in the low prosody condition and two of them were judged to be more charismatic while speaking in the high prosody condition. It was found that the participants were influenced in their ratings by how attractive they thought the speaker was (Brem & Niebuhr, 2021). Therefore, it is necessary to conduct more research into how speaking rate affects charisma perception in female speakers and whether a slower speaking rate is really regarded as more charismatic.

Intensity level

Intensity has also been researched as a possible characteristic of charismatic speech. The definition of intensity is "the strength of a sound signal measured in decibels" (Brown & Miller, 2013). It is related to loudness and amplitude, which is "the property of a sound wave associated with perceived loudness" (Brown & Miller, 2013). Intensity would refer to the vocal effort of the speaker, while loudness refers to the perception of the listener of the vocal effort. The research on the effect of intensity on perceived charisma is conflicting, and it has been argued that intensity is not as important to charisma perception as pitch, for example (Niebuhr & Skarnitzl, 2021). Hirschberg & Rosenberg (2005) found that louder utterances were positively correlated with ratings of charisma, suggesting that louder speakers are perceived as more charismatic. This study looked at intensity as a measure of loudness of a speaker. In this study, 9 politicians from the Democratic party were rated by 8 native speakers of American on a number of attributes. It was found that the mean intensity was significantly correlated with charisma when analysing results for their study. However, all tokens used in the study were previously normalised for intensity. This means that only the mean and standard deviation of intensity could be studied. Hirschberg & Rosenberg (2005) state in the conclusion: "the louder the token, the more charismatic the speaker is rated" (p.4).

In a follow-up study (Rosenberg & Hirschberg, 2009), there was no significant correlation found between intensity and charisma. The design of this study was the same as the one conducted in 2005. However, this study appeared to dive deeper into intra-rater consistency, considering the individual raters' definitions of charisma. Intensity was used as an indicator of perceived loudness. As in the study from 2005, the stimuli had all been normalised for intensity to ensure there was no interference from the recording conditions. This meant that only the standard deviation and mean of intensity could be considered for every stimulus. This did not yield any significant results. The correlation between mean

intensity and charisma approached significance, but was not significant Therefore, these studies do not allow for a clear overview on the relationship between charisma and intensity.

To attempt to clear up the confusion surrounding the relationship between intensity and charisma, Niebuhr & Skarnitzl (2021) set up a study where fifteen acoustic parameters[2] were measured and analysed whether they correlated with charisma ratings. The parameters were divided in three groups: measures related to loudness level, loudness range/change and various indicators of spectral slope. The question they addressed was: If and to what extent does vocal effort correlate with perceived speaker charisma? Additionally, the focus was on which acoustic measurements most accurately represent the correlation between intensity and charisma. They also took into account speaker gender[3]. The definition of intensity they used was "loudness or vocal effort" (p.1). 50 participants were asked to rate 51 speakers on charisma, specifically whether or not they would invest their own money in the company of the speaker. Notably, the speeches were all delexicalized to ensure there was no influence of content. Results indicated that vocal effort is correlated with charisma. However, the correlations were on the weak side. This can be explained: pitch is more important for charisma than loudness (Niebuhr & Skarnitzl, 2021). Additionally, there was an effect of speaker gender: for female speakers, charisma is more strongly correlated with loudness level, and for male speakers charisma is more strongly correlated with a change in loudness (Niebuhr & Skarnitzl, 2021). However, it is mentioned that loudness itself might not necessarily be relevant for charisma: "loudness change or variability is also a reflection of the speaker's ability to realize a pronounced, salient contrast between stressed and unstressed

[2] Root-mean-square (rms) amplitude of the signal, mean sound pressure level (SPL), median SPL, 90th quartile of SPL, SPL standard deviation, 90th quartile of SPL minus median SPL, 90th quartile of SPL minus mean SPL, maximum SPL minus median SPL, maximum SPL minus mean SPL, the alpha measure (defined as the ratio of the energy of the 1—5 kHz band and of the 0—1 kHz band), a derived alpha (which considers high frequencies up to 8 kHz, Kitzing's index, Ternström's index, two indices proposed by Volín (p. 2, Niebuhr & Skarnitzl, 2021).

[3] As mentioned in Brem & Niebuhr (2021), gender is used to refer to the concept of biological 'sex'.

words when presenting" (p. 4). It is possible that a contrast between words is more important for charisma perception than loudness.

Research by Yang et al. (2020) found that intensity correlated with charisma as well, but only in the case of female speech and not for male speech. The definition of charisma adhered to in this study was that of Weber: "a certain quality of an individual personality, by virtue of which he is set apart from ordinary men and treated as endowed with supernatural, superhuman, or at least specifically exceptional powers or qualities not accessible to the ordinary person" (p. 1, in Yang et al., 2020). The study found that there was a correlation between intensity and perceived charisma, but only for the female speakers and not for the male speakers, suggesting that intensity is not important for perceived charisma of male speakers. The results of Yang et al. (2020) contradict findings by Hirschberg & Rosenberg (2005, 2009), as all the speakers in those studies were male except for one, and they did find a correlation between intensity and charisma. The study by Niebuhr & Skarnitzl (2021) also finds a gender-specific correlation: female speakers benefit from loudness level, while male speakers benefit from loudness change. As Yang et al. (2020) considered intensity level, rather than variation in intensity, these studies support each other's findings: female speakers benefit from a higher level of loudness.

Articulation

Lastly, clear articulation is essential for charismatic speech (Niebuhr, Tegtmeier & Brem, 2017). Articulation refers to how accurately a speaker can produce speech sounds. This is likely linked to speaking rate. A speaker can only increase their speaking rate to a certain degree before their clarity of articulation decreases. However, if a speaker sounds completely flawless in terms of articulation, this can actually reduce their charisma rating (Niebuhr, Tegtmeier & Brem, 2017). This is because their speech sounds too meticulously planned and

possibly even vain, rather than sincere. Therefore, the speaker must articulate clearly, but some speech reduction is necessary (Niebuhr, Tegtmeier & Brem, 2017).

Niebuhr, Thumm & Michalsky (2018) investigated whether "clear and crisp articulation of every phrase and word is imperative to develop charisma" (p. 582). This was investigated by comparing Steve Jobs (SJ) and Mark Zuckerberg (MZ). It was established that SJ uses a larger vowel space than MZ (Niebuhr, Thumm & Michalsky, 2018). However, the question is whether clear articulation then also applies to consonants, or if this effect is only for vowels. Assimilation of consonants, as well as the duration of stops were taken into account. SJ's speech used less assimilations than MZ and there were more differences between /bdg/ and /ptk/ in terms of duration and voicing, meaning that they can be more clearly distinguished from each other (Niebuhr, Thumm & Michalsky, 2018). SJ was confirmed to be the more charismatic speaker, which means that a clearer articulation of both vowels and consonants is essential.

Limits

As such, there are many features that are important in order for a speaker to sound charismatic. These include a higher pitch as well as a higher variability of pitch, a higher intensity, a faster speaking rate and clear articulation. Some features contribute more to the perception of charisma than others. A faster speaking rate is more important than variation in pitch. In turn, variation in pitch is more important than a raised pitch level (Niebuhr, Tegtmeier & Brem, 2017).

However, for all features it must be noted that there is a limit to how much they contribute to the perception of charisma. Speakers with a pitch that is too high will be perceived as less charismatic, as will speakers that speak too fast or too loudly. Rosenberg & Hirschberg (2009) state that "while these linear relationships are confirmed by the data, the true nature of some of these interactions may be at least potentially U-shaped rather than truly

linear" (p. 648). Therefore, it should be kept in mind that features such as pitch of speaking rate can only be increased so much to sound more charismatic.

This is corroborated in a study by Berger, Niebuhr & Peters (2017). The study found that a faster speech rate was preferred for charismatic speech, but not too fast. If the speech rate is too high, this will also influence the understandability for the listener. Interestingly enough, the study largely supported the prosodic characteristics of charisma found in the previous literature, but not in terms of f0 level. There was support for a faster speech rate and a larger f0 range, as these received significantly higher scores than the lower speech rate and the smaller f0 range. The higher f0 level was judged to be less attractive than the lower and unaltered f0 levels (Berger, Niebuhr & Peters, 2017). Previous research had posited that there was a positive correlation between a high f0 level and charisma ratings (Rosenberg & Hirschberg, 2009). Thus, this study (Berger, Niebuhr & Peters, 2017) does not support findings by others that a higher f0 level contributes to a positive perception of charisma (Hirschberg & Rosenberg, 2005; Niebuhr, Thumm & Michalsky, 2018). A few possible reasons are mentioned for this, such as the synthesized stimuli rather than spontaneous stimuli, which creates artifacts in the recording that might influence the listener. However, it is important to keep in mind that many previous studies on charisma have used political speeches, or speeches from well-known public figures, which are also not truly spontaneous (Rosenberg & Hirschberg, 2009). This study used speech from two university lecturers. It is possible that the fact that listeners knew the speakers influenced their ratings (Berger, Niebuhr & Peters, 2017).

Lastly, it must be noted that although prosodic elements can contribute strongly to the perception of charisma, the lexical content of the speech that is studied can also strongly contribute to charisma. Some papers use delexicalized content (Rosenberg & Hirschberg, 2009; Niebuhr & Skarnitzl, 2021), but others keep the speech unaltered (Brem & Niebuhr,

2021). Delexicalized content was created by filtering the speech, only keeping the prosodic information in the signal (Niebuhr & Skarnitzl, 2021). Using delexicalized stimuli ensures that there is no interference from lexical content, meaning that the effects measures are purely due to the prosodic information. The current study will use lexical content, but it will be ensured that it is identical for all stimuli, hopefully minimally influencing the ratings.

Gender bias in charisma research

Though the existing literature has contributed much to our understanding of the prosodic features of charisma, there is one important element missing in much of the research: the inclusion of female speakers. Many studies have exclusively looked at male speakers. For example, within the abovementioned seven studies, which discuss all the prosodic aspects important to charisma, only two studies have used either only female speakers (Yang et al., 2020), or half the speakers have been female (Brem & Niebuhr, 2021). Of the other five, only one female speaker was included, (Hirschberg & Rosenberg, 2005; Rosenberg & Hirschberg, 2009) or none at all (Niebuhr, Thumm & Michalsky, 2018; Niebuhr, Tegtmeier & Brem, 2017; Berger, Niebuhr & Peters, 2017). However, assuming that the prosodic features of male charismatic speech hold for female speech as well would be presumptuous. This is why more research into the charismatic properties of female speech must be conducted, especially since the few available data on female charismatic speech are conflicting (Brem & Niebuhr, 2021).

It has been posited that it is beneficial for women decrease their speaking rate in order to be perceived as more charismatic (Brem & Niebuhr, 2021). There is likely also a gender stereotype involved in this finding: women sound faster than men, even though they employ the same speaking rate (Brem & Niebuhr, 2021). This is likely due to the fact that female speakers generally produce longer vowels than male speakers, because they have a larger vowel space (Weirich & Simpson, 2014). There are two reasons for this: biologically, women

have a relatively larger vowel space than men due to physical differences in oral and pharyngeal cavity length (Weirich & Simpson, 2014). Additionally, women are said to articulate more clearly than men. For example, men exhibit more elision and vowel reduction, contributing to a less clear articulation (Weirich & Simpson, 2014). As such, the stereotype arises that women speak faster. It is explained: "a speaker traversing a large acoustic space in the same time as a speaker traversing a small acoustic space might be perceived to be speaking faster" (p. 2, Weirich & Simpson, 2014). However, this is a matter of perception rather than fact. It is possible that this stereotype has given rise to the idea that women need to slow their speaking rate to sound more charismatic. As mentioned, for any speaker there is a maximum threshold to how much they should increase or decrease their speaking rate to maintain intelligibility (Berger, Niebuhr & Peters, 2017). If women are perceived to be speaking faster than men, then the idea that they should slow their speaking rate follows from this. In addition, a speaker that speaks slowly rather than too quickly sounds more self-assured and confident, but not too slowly at the risk of sounding hesitant (Rosenberg & Hirschberg, 2009).

Furthermore, it was suggested that a lowered pitch would help women to sound more charismatic rather than a raised pitch. This was shown first by Niebuhr, Skarnitzl & Tylecková (2018). Twelve students were asked to give a presentation asking for investments into a project. Upon analysis, it was found that listeners were more likely to invest if there was more variation in pitch. Interestingly enough, a negative correlation was discovered between speaker performance ratings and the pitch level (Niebuhr, Skarnitzl & Tylecková, 2018). If the pitch level decreased, the performance of the speakers increased. Additionally, an effect of speaker sex was found: male speakers required a higher pitch level to perform better, and female speakers required a lower pitch level. Additionally, the listeners were already less likely to invest in projects presented by female speakers, even before they had

spoken (Niebuhr, Skarnitzl & Tylecková, 2018). It was concluded that female speakers should lower their f0 level and are generally perceived to be less charismatic than male speakers.

However, Yang et al. (2020) comment that the scoring system created for Niebuhr, Skarnitzl & Tylecková (2018) was done so based on knowledge from the previous literature. A strong possibility exists that the previous research is biased (Rosenberg & Hirschberg, 2009), as it mostly investigated male speech and did not contain a full understanding of female charismatic speech (Yang et al., 2020). In addition, the paper by Niebuhr, Skarnitzl & Tylecková (2018) did not mention the gender of the 98 raters. It is possible that female raters judge participants differently than male raters.

The overall conclusion that female speakers should speak in a lower pitch to sound more charismatic was supported by Yang et al. (2020), who found that mean pitch, speaking rate and variance in pitch were all positively correlated with charisma, meaning that a higher pitch, speaking rate and variance lead to higher charisma scores. However, there was an effect of gender: for female speech, only mean intensity was significantly correlated. For male speech, mean pitch and speaking rate were significantly correlated (Yang et al., 2020). Thus it was concluded: for female speech, there is no effect on charisma if speakers use a higher pitch or faster speaking rate. Rather, a heightened intensity contributes to perceived charisma.

Using two different prosody conditions, Brem & Niebuhr (2021) tested how charismatic participants found a number male and female CEO's. This was combined with research into the effect of attire, as well as prosody. Speeches by CEOs were analysed and manipulated to create a low and a high prosody condition. For the low prosody condition, the speaking rate was decreased by 10% and the pitch by two semitones. For the high prosody condition, the speaking rate was increased by 10%, and the pitch by 2 semitones (Brem &

Niebuhr, 2021). There were also two types of conditions for attire: conservative and expressive. The aim of the research was to understand how the interplay of prosody and attire affected the perception of charisma. For female speakers, the low prosody condition was the most charismatic, while the high prosody condition was most charismatic for male speakers (Brem & Niebuhr, 2021). The conservative and expressive attire conditions affected the male and female speakers differently. For the male speakers, conservative attire contributed to a higher perception of charisma. For two of the female speakers, the expressive attire contributed more, and for the other two female speakers the conservative attire contributed to a higher perception of charisma.

However, this research by Brem & Niebuhr (2021) also showcases the many biases raters have when it comes to comparing male and female speakers. For male speakers, the results were similar for all speakers: the high prosody condition, in combination with conservative attire were the most charismatic (Brem & Niebuhr, 2021). For female speakers, the results were different for two out of the four speakers. Post-test, another questionnaire was conducted where it was revealed that two of the speakers were judged to be more attractive. For these speakers, the low prosody condition was the most charismatic, as well as the expressive attire condition (Brem & Niebuhr, 2021). For the other two 'less attractive' speakers, the conservative attire was seen as the most charismatic, and the high prosody condition was more charismatic (Brem & Niebuhr, 2021). Overall, the results still indicate a stronger effect of the low prosody condition for women.

Even if women produce the same charismatic cues as men (pitch, speaking rate, clear articulation), it was found that they are still judged to be less charismatic (Novak-Tót et al., 2017). Three speakers were compared: Oprah Winfrey, Ginni Rometty and Steve Jobs. Their speech was analysed for hesitations, speaking rate, acoustic energy level and to what extent they used emphatic accentuation (Novak-Tót et al., 2017). Emphatic accentuation refers to

speech where emphasis is placed on certain words in a sentence. It was hypothesized that women need to produce stronger charisma cues than men to be judged as equally charismatic. Oprah Winfrey and Ginni Rometty both were less hesitant in their speech and had a higher acoustic-energy level than Steve Jobs. Out of the two female speakers, only Oprah Winfrey used more emphatic accents than Steve Jobs. Both female speakers used more charisma cues than Steve Jobs but were judged similarly. This suggests that female speakers are rated equally as charismatic as men, even though they use more charismatic elements in their speech (Novak-Tót et al., 2017).

Charisma perception across cultures

The perception of charisma is likely affected by culture. Research by Biadsy et al. (2008) comparing the perception of charisma in American, Palestinian and Swedish speech has shown that certain cultures rate certain features as more charismatic. When considering the attributes that make up charisma, American raters value persuasiveness, charm, passion and convincingness, and the speaker must not be boring or ordinary. On the other hand, Palestinian raters prefer a charismatic speaker to be tough, charming, persuasive, enthusiastic, powerful, and not boring or desperate (Biadsy et al., 2008). There is some overlap: both cultures value a speaker who is persuasive, charming and not boring. However, there are differences according to Biadsy et al. (2008): Americans value passion and convincingness, while Palestinians consider it important to be tough, enthusiastic, and powerful. An interesting distinction is made between ordinary and desperate. American listeners do not want speakers to sound ordinary, or like they have heard it before. Palestinian listeners do not want their speaker to try too hard or be too desperate.

In terms of acoustic-prosodic features, mean pitch, mean and standard deviation of intensity and token duration were all found to be positively correlated with charisma across all included cultures, despite differences between the language being rated and the native

language of the rater (Biadsy et al., 2008). This means that a higher f0, a varied as well as high intensity and a longer duration of stimuli were rated as charismatic. For Swedish and American ratings of American English, speaking rate was positively correlated. This was not the case for Palestinian ratings of charisma. For Palestinian speakers rating Arabic, the correlation between speaking rate and charisma approached negativity (Biadsy et al., 2008). Thus, it seems that a lower speaking rate is more likely to indicate a charismatic speaker in American and Swedish cultures, as was found in Berger et al. (2017) and Brem & Niebuhr (2021). However, for Palestinian speakers rating American English, there was no correlation. This was also the case for American speakers judging Arabic: speaking rate did not affect charisma ratings (Biadsy et al., 2008).

Research by D'Errico et al. (2013) focused on cultural differences between Italian and French native speakers, and how these differences affect the perception of charisma. They distinguish between institutionally oriented cultures, and impulsively oriented cultures. In institutionally oriented cultures, there are strong rules and norms that regulate emotions in order to fulfil standards and institutional roles. On the other hand, impulsively oriented cultures have a lower regulation of emotions in public and institutional contexts (D'Errico et al., 2013). The French culture appears to belong to the institutionally oriented cultures, as indirectness and eloquence are valued in French communication (D'Errico et al., 2013). Reflective pauses are used to discuss points indirectly, as well as nuance and tact. To understand how Italian and French cultures value charisma differently, French and Italian participants were asked to judge speeches by an Italian and a French politician. It was hypothesized that both pitch and pause length would influence both cultures' perception of charisma (D'Errico et al., 2013). Across cultures, speakers with a lower pitch are generally perceived as being more dominant, while speakers with a higher pitch are seen as more subordinate (D'Errico et al., 2013). It was found that the Italian judges found a proactive-

attractive dimension more important than a calm-benevolent dimension of charisma. The proactive-attractive dimension referred to the adjectives “vigorous, active, dynamic, brave, determined” (p. 553), and the calm-benevolent dimension referred to “wise, prudent, reliable, fair, intelligent, honest, sincere, sagacious” (p. 553). For the French judges, there was no difference in importance between the two dimensions (D’Errico et al., 2013). Overall, the charisma ratings for short pauses were higher than for long pauses. Short pauses had an effect on the attributes ‘dominance’, ‘passion’ and ‘seductiveness’: these attributes were most affected by short pauses and not by long pauses. The Italian and French judges differed in their perception of pauses. For Italian speakers, short pauses with a normal or higher pitch contributed to the idea of a prudent and wise leader. For the French, this was the case when listening to long pauses with a normal or higher pitch (D’Errico et al., 2013). Thus, both cultures have different perceptions of charisma in terms of pitch and pause length.

Gutnyk, Niebuhr & Gu (2021) did an even broader cross-cultural comparison of charisma perception, including speakers of Chinese, Ukrainian, Spanish, German, Turkish and Brazilian. The goal of the research was to study whether charismatic speech is expressed using the same prosodical features in different cultures. The first hypothesis was that speakers of these different languages would produce different acoustic-prosodic patterns when giving a charismatic speech. Additionally, the gender bias in different cultures was considered and how this was reflected in charisma perception. One of the main findings was that: “a leader will be perceived as more charismatic if they express themselves coherently with cultural expectations” (p. 3, Gutnyk, Niebuhr & Gu, 2021). This highlights the influence of culture on charisma perception. For example, there are differences between the Western oral tradition and the Chinese oral tradition, which could still influence how speakers express themselves today. Western Oral tradition has been strongly influenced by the Greeks, including Aristotle and Cicero. This refers to the theory of rhetoric, which posits that a speaker must possess so-

called *ethos*, *pathos* and *logos* in order to be seen as an authoritative speaker (Gutnyk, Niebuhr & Gu, 2021). To illustrate that culture plays a significant role in how we communicate one another, a few examples will be given. In Greek society, it was expected of citizens to take actively participate in political business, by attending political meetings and using rhetoric to express their opinions (Gutnyk, Niebuhr & Gu, 2021). This expectation was not shared in China, where public speaking was not prominent in politics. In fact, the Chinese written tradition is much stronger than the oral tradition, having been influenced by Confucianism, Buddhism and Taoism (Gutnyk, Niebuhr & Gu, 2021). On the other hand, Muslims have a strong oral tradition. This is because Allah's prophet was known for his eloquence and clarity of speech (Gutnyk, Niebuhr & Gu, 2021). Therefore, it stands to reason that participants with a Chinese background will value different characteristics in speakers than participants influenced by Western and Muslim oral traditions. Likely, participants in the current research will value characteristics from the Western oral tradition.

Taking these influences into account, it was predicted that Spanish, German, Ukrainian and Brazilian speakers would be influenced by Western oral traditions, Turkish speakers following the Muslim traditions, and Chinese speakers would follow the Confucian tradition (Gutnyk, Niebuhr & Gu, 2021). For every country, ten male and ten female speakers were instructed to give a charismatic speech. The interpretation of charisma was up to the speakers. One of the speeches had to be addressed to an imaginary male audience, and another to an imaginary female audience. In terms of pitch level and pitch variability, German speakers had the highest pitch, and Spanish speakers the lowest pitch. Chinese speakers had the lowest tempo, and Brazilian and Ukrainian speakers spoke the fastest. Breathiness was also considered, which refers to a manner of speaking where air escapes through the vocal folds whilst they are vibrating (Brown & Miller, 2013). Chinese speakers were least breathy, while Ukrainian and Turkish speakers were most breathy. Ukrainian and Turkish speakers

also inserted more silent pauses in their speeches compared to German and Spanish speakers (Gutnyk, Niebuhr & Gu, 2021). As such, the hypothesis that different cultures use different acoustic-prosodic features was supported. This means that Dutch raters might prefer a higher pitch and fewer silent pauses, similar to the German participants.

As for the differences between genders, women spoke slower than men, but were breathier. They were more stable in terms of pitch and made fewer pauses (Gutnyk, Niebuhr & Gu, 2021). Ukrainian, Turkish and Brazilian speakers differed most strongly with respect to gender than speakers from Germany, Spain and China. This means that the prosody men and women used was most different in Turkey and Brazil (Gutnyk, Niebuhr & Gu, 2021). In conclusion, speakers from Ukraine, Turkey and Brazil had the most similar acoustic profile, and German and Spanish speakers behaved similarly in terms of rating speaker charisma. Chinese charismatic speech was similar to that of Spain, but Chinese perceptual preferences strongly correlated with Ukrainian, Turkish and Brazilian speakers.

Effect of Accent: General American and Standard British

Aside from the influence of cultural values on charisma perception, there is a possibility that a speaker's accent also influences charisma. An accent reveals where a speaker is from, and therefore hints at their cultural values. As stated before: listeners judge a speaker as most charismatic when they express themselves in line with the culture (Gutnyk, Niebuhr & Gu, 2021) . When listeners hear an accent that is not their own, they can form biases against the speaker. These can be positive or negative, and therefore also influence their perception of charisma. The current study will compare the General American (GA) accent and the Standard British (SB) accent. Therefore, a brief comparison of relevant features for both accents will be given.

Though both General American (GA) and Standard British (SB) are both English varieties, there are many well-known differences in phonetics and lexicon. However, there

are also prosodic differences, such as speaking rate. Generally, speakers of SB have a faster speaking rate than those of GA. Speakers of SB generally have a rate of 260 syllables per minute (spm) (Robb & Gillon, 2007). The rates for radio, conversation, interviews and lectures were measured, revealing an average rate of 230-280 spm (Tauroza & Allison, 1990). For speakers of GA, the average spm is 250 (Robb & Gillon, 2007).

Furthermore, the phonological properties of both accents are slightly different. American vowels tend to be more nasalised, while British vowels are rarely nasalised (Hosseinzadeh, Kambuziya & Shariati, 2015). Additionally, British speakers do not employ a rhotic accent, while an overwhelming majority of American speakers do (Hosseinzadeh, Kambuziya & Shariati, 2015).

It is possible that the accent a speaker uses has an effect on the perception of charisma. If the speaking rate has a strong influence, as suggested in research by Hirschberg & Rosenberg (2009), then the listener would prefer the accent with the speaking rate they consider most charismatic. In this case, speakers of GA have a slower speaking rate, which would be more charismatic for female speech (Brem & Niebuhr, 2021; Yang et al., 2020). On the other hand, for male charismatic speech, a faster speaking rate is seen as more charismatic (Rosenberg & Hirschberg, 2009). As such, it is possible that there is an effect of accent or gender on charisma. However, it remains to be seen which is stronger.

Additionally, it is important to remember that a non-native speaker of English will perceive a native English accent differently. Japanese society favours GA and SB accents over Japanese English accents, but only in terms of status. An English accent tinged with Japanese is preferred in terms of solidarity (McKenzie, 2008). On the other hand, English learners in Europe prefer SB over GA when it comes to competence and status, as well as how aesthetically pleasing the accent is (Davyhova, 2015). GA is preferred over SB in terms of social attractiveness.

In a study on accent perception (Davyhova, 2015) German learners of English were asked about their opinions of British English and American English. Specifically, they were asked about their thoughts on how prestigious, socially attractive, and high-status they considered the two varieties to be. It was also noted whether or not the participants spoke the varieties themselves. SB received higher scores in terms of status and how prestigious it was considered. Additionally, GA received higher ratings for social attractiveness as well as solidarity. Additionally, it was found that German students preferred GA over the variety of German English and identified themselves more strongly with GA than SB.

Additionally, the study by Davyhova (2015) had participants listen to speakers of the two varieties of English and grade the speakers on a semantic scale. The results revealed that the attributes used in the semantic scales could be divided into two groups. The first group was linked to status and competence, and contained the attributes: ‘reliable’, ‘trustworthy’, ‘competent’, ‘educated’, ‘disciplined’ and ‘intelligent’. The second group was linked to social attractiveness and contained the attributes ‘relaxed’, ‘friendly’ and ‘cool’. The results of this second rating indicated that SB received higher scores for the attributes of status and competence, and GA higher scores for the attributes linked to social attractiveness, which is in line with the results from the first rating. The overall conclusion of the study was that German learners of English preferred native varieties of English over German and Indian Englishes, because they are associated with competence and social attractiveness. This shows that non-native speakers of English have different perceptions of native English accents, which could influence their charisma perception as well.

Summary

The literature reviewed above presents some conflicting information with regard to the prosodic attributes of charismatic speech in women. The findings from some studies suggest that a lower pitch and speaking rate are beneficial for women to be seen as

charismatic (Brem & Niebuhr, 2021), while others state that these do not have an effect, but that intensity is positively correlated with charisma (Yang et al., 2020). Table 1 below presents a summary of the correlations between certain prosodic features and charisma perception of female speech for a number of the previously mentioned studies. A '+' indicates a positive correlation, while a '-' indicates a negative correlation. Furthermore, an 'x' indicates no correlation was found, while 'n.a.' indicates that the prosodic feature was not mentioned in the study.

Table 1: Summary of correlations per study for female speech

	Brem & Niebuhr (2021)	**Yang et al. (2020)**	**Niebuhr, Skarnitzl & Tylecková (2018)**	**Novak-Tót et al. (2017)**
Slower speaking rate	+	x	n.a.	-
Lower pitch	+	x	+	n.a.
Pitch variation	n.a.	+	n.a.	n.a.
Higher intensity	n.a.	+	n.a.	+
Clarity of articulation	+	n.a.	n.a.	n.a.

The Current Study

The current study focuses on prosody, accent, their interaction and how these affect charisma perception in female speech. The research questions that will be addressed are:

1. Does having a General American (GA) or Standard British (SB) accent affect perceived charisma in female speakers?

2. Does the prosody used by the speaker affect perceived charisma in female speakers?
3. Does the rater gender influence charisma ratings of female speakers?

In the existing literature there is a gap when it comes to research on female speakers. There is reason to believe that female speakers use different charisma cues than male speakers (Niebuhr, Skarnitzl & Tylecková, 2018; Yang et al., 2020). While some papers suggest that female speakers should use a lower pitch and slower speaking rate (Brem & Niebuhr, 2021), others state that female speakers should adhere to charisma cues that are used by male speakers (Novak-Tót et al., 2017). Additionally, there is little research on the effect of accent on the perception of charisma. Existing papers that have looked at this considered Chinese, Ukrainian, Spanish, German, Turkish and Brazilian (Gutnyk, Niebuhr & Gu, 2021). The current study will look at how native speakers of Dutch perceive speakers of American and British English. The participants rating the speakers will be required to speak English so that they can understand the speakers as they rate them.

Furthermore, there is reason to believe that the rater gender influences the charisma ratings given to speakers. Male raters are already less likely to invest in ideas if they are presented by female speakers (Niebuhr, Skarnitzl & Tylecková, 2018).

Therefore, it is hypothesized that the type of prosody speakers use will have a strong effect on the rating of charisma, but as the previous research presents conflicting information it is unclear whether raters will prefer a high or low prosody for female speakers. Nonetheless, a difference in ratings will be expected depending on the prosody condition. Furthermore, the participants will likely rate the accent they identify the most with on a cultural level as the most charismatic. It is also likely that the rater gender will influence ratings of charisma, such that female raters will rate female speakers higher than male raters.

Methodology

Materials

Audio excerpts from the International Dialects of English Archive (IDEA) Corpus were used (2024, IDEA Corpus). This corpus contains recordings of hundreds of different dialects and accents from volunteers. This is extremely appropriate for the purpose of this research, because previous research has suggested that participants may be biased when judging speakers they are familiar with (Rosenberg & Hirschberg, 2009): If a speaker is recognisable the participant may rate them as being more charismatic. The IDEA corpus (2024) offers a wealth of audio material from unknown speakers of different genders and varying ages.

The corpus asks its speakers to read a specific passage *Comma Gets A Cure*, which was written with the intention of getting speakers to pronounce a variety of phonemes. One of the first sentence of the excerpt will be used, which reads: “Sarah Perry was a veterinary nurse who had been working daily at an old zoo in a deserted district of the territory” (IDEA Corpus). Eight excerpts from female speakers will be chosen, four with General American (GA) accents and four with Standard British (SB) accents. The overview of recordings used can be found in Table 2.

Speakers from the west of the USA were used for the GA accents, from California and Oregon. For the SB accents, speakers from the southwest and southeast of the UK were chosen. For all speakers, the goal was to ensure a variety of ages. However, the corpus is limited in terms of the number of speakers suitable for the current project. As such, an attempt was made to match up the ages of speakers for both groups. However, on average the SB speakers are older than the GA speakers.

Table 2: Overview of Recordings from the IDEA Corpus

Speaker	Accent	Age	Region/State	Excerpt used	Excerpt length	Corpus name
1	SB	21	Southwest	0.10-0.19	9 sec	England 70
2	SB	45	Southeast	0.13-0.20	7 sec	England 88
3	SB	50s	Southwest	0.15-0.23	8 sec	England 51
4	SB	68	Southwest	0.15-0.23	8 sec	England 34
5	GA	24	California	0.14-0.20	6 sec	California 4
6	GA	33	Oregon	0.18-0.27	9 sec	Oregon 5
7	GA	36	California	0.15-0.23	8 sec	California 7
8	GA	54	California	0.16-0.21	5 sec	California 15

In addition, all excerpts were chosen to be between 5 and 9 seconds in length to allow participants to quickly listen, and judge speakers. This is to prevent them from judging speakers too positively, as it is possible that rating scores increase the more familiar a participant becomes with a speaker (Rosenberg & Hirschberg, 2009).

The audio files were manipulated using PSOLA resynthesis in PRAAT (Boersma & Weenink, 2024). Two conditions were created for each speaker: a high and a low prosody condition. In the low condition, the speaking rate was decreased by 10%, and the pitch was lowered by 10%. For the high condition, the speaking rate was increased by 10% and the pitch was increased by 10%. The pitch was manipulated by multiplying the pitch by a factor of 1.1 to increase it and multiplying it by a factor of 0.9 to decrease it. For a longer duration, the speaking rate was multiplied by a factor of 1.1. For a shorter duration, the speaking rate was multiplied by a factor of 0.9.

2 conditions for 8 audio files yielded 16 different stimuli. Each audio file ranged from 5 to 9 seconds in length, ensuring that the beginning and end of the fragment coincide with utterance boundaries. Ideally, all recordings would be similar in length, with only a second difference between them. However, due to the different speaking rates in the recordings, the original audios differ in length. When the recordings are manipulated, the two different conditions will also yield stimuli of varying length. Table 3 presents an overview of the stimuli, their length, average speaking rate and average pitch. On average, the SB speakers have a higher pitch than the GA speakers with a mean pitch of 84.9 Hz (SD = 5.06) in the low condition and 104.7 Hz (SD = 6.27) in the high condition. The GA speakers average 83.6 Hz (SD = 8.46) in the low condition and 99.2 Hz (SD = 8.44) in the high condition.

Table 3: Overview of stimuli

Speaker	Accent	Condition	Excerpt Length (sec)	Pitch (Hz)
1	SB	Low	8.40	85.8
1	SB	High	6.86	104.8
2	SB	Low	6.27	80.1
2	SB	High	5.16	95.5
3	SB	Low	7.46	92.8
3	SB	High	6.06	113.2
4	SB	Low	7.71	80.9
4	SB	High	6.33	105.2
5	GA	Low	7.01	82.0
5	GA	High	5.74	97.9
6	GA	Low	9.29	89.4
6	GA	High	7.87	109.2
7	GA	Low	8.78	92.6

7	GA	High	7.10	103.3
8	GA	Low	5.73	70.6
8	GA	High	4.64	86.3

Procedure

The experiment took place in an online setting. Raters were presented with all 16 stimuli in a questionnaire and asked to rate these on a scale of 1 to 10 using sliders. The questionnaire was created using Qualtrics (Qualtrics, 2024). The full set of questions can be found in Appendix A. The questionnaire was presented in Dutch, as the targeted participants were native Dutch speakers. Firstly, instructions were given as to the nature of the questionnaire. It was stressed that participants' subjective opinion of the speakers was important and that the speakers should not be compared to one another. A question about informed consent followed, which the participants had to fill in to be allowed to continue to the questionnaire. Next, an attention check followed. Participants listened to an audio which stated: "This is an attention check. Please select 2 on the scale". The purpose of this was twofold: it checked to see whether participants were giving the questionnaire their full attention, but it also ensured that there were no technical issues. The results revealed that ten participants did not pass the attention check, but their ratings were included in the analysis, as the other ratings were all complete and it was likely they were focused on the listening exercise at hand and did not pay attention to the lexical content. A few participants had only selected the correct score on the first of the four sliders, while others had not selected two on any of them.

The stimuli were presented in a random order. Participants were asked to rate each speaker on a scale of 1-10, on 4 attributes. The attributes were: 'enthusiastic', 'convincing', 'confident' and 'interesting'. The basis for choosing these attributes came from

Hirschberg & Rosenberg (2005) and Brem & Niebuhr (2021). As mentioned, participants respond differently when asked to rate charisma directly (Brem & Niebuhr, 2021). This is likely due to the different interpretation of charisma each participant has. Therefore, the 4 aforementioned characteristics will be used. For every individual attribute, the participants will rate the speaker. The attribute 'interesting' was chosen in place of 'boring'. It was important to include boring as one of the attributes, as a speaker cannot be considered charismatic if they are boring (Biadsy et al., 2008; Rosenberg & Hirschberg, 2009). However, 3 positive attributes and one negative attribute were confusing to the raters. As such, rather than 'boring', its antonym 'interesting' was chosen. A low score for 'interesting' would indicate a high score for 'boring'.

Each audio would play automatically once the participant advanced to the next page. They would find 4 sliders for each attribute. A score of 1 would indicate 'not enthusiastic/confident/convincing/interesting at all', while a score of 10 indicated 'extremely enthusiastic/confident/convincing/interesting'. It was chosen to start with the indicators at 5, because 5 would be the most neutral option and not lean negative or positive.

Following the rating of the speakers, a few more questions were asked concerning the participants' age, gender, language level in Dutch and English and their preferences for English accents. At the end of the questionnaire the participants were given the opportunity to leave comments or questions.

Participants

In total, 53 participants completed the questionnaire. 39 of these were women, 11 were men and 3 were non-binary. The participants were all native speakers of Dutch, ranging in age from 20 to 30 years old. All participants were asked to rate their Dutch reading, writing, listening, and speaking skills on a scale of 1-10. On average, the participants rated their reading an 8.74, writing an 8.25, listening a 9.23 and speaking an 8.70. Additionally,

they had to include the number of years they had been using Dutch, which was 24.33 years on average. Since all speakers indicated they spoke Dutch from birth, this is also the average age of the participants. The average age at which the participants had started learning English was 9.04 years and they had been using English for an average of 14.81 years. Furthermore, it was asked what kind of English they had learned in school and whether they had a preference: British or American. Lastly, it was asked which type of English they heard most in their professional lives versus their free time. The overview of their accent preferences and exposure can be found in table 4.

Table 4: Accent preferences and exposure of participants

		Women	**Men**	**Non-binary**	**Total**
Preference for:	GA	7	3	-	10
	SB	**21**	**5**	**3**	**29**
	Na	11	3	-	14
Learned in school:	GA	11	**6**	-	17
	SB	**15**	3	**3**	**21**
	Na	13	2	-	15
Free time:	GA	**23**	**5**	**2**	**30**
	SB	3	-	-	3
	Na/50-50	13	6	1	20
Professional life:	GA	14	3	-	17
	SB	3	2	-	5
	Na/ 50-50	**22**	**6**	**3**	**31**

From table 4, it is clear that the participants have a general preference for the SB accent and learned this most in school. However, in their free time they are most often exposed to a GA accent. It is possible that raters might be biased towards one of the accents, as non-native speakers of English perceive native accents differently (Davyhova, 2015). Raters might already have had an opinion formed about which accent they prefer, and

therefore would rate it as more charismatic. There is a possibility that the prosodic features of each accent influence the ratings. For example, GA speakers tend to have a slower speaking rate than SB speakers (Robb & Gillon, 2007). In female speakers, a slower speaking rate is considered more charismatic (Brem & Niebuhr, 2021), meaning that raters might be biased towards a GA accent and consider it more charismatic.

Results

53 participants filled in the questionnaire in total. 39 participants were female, 11 were male and 3 were non-binary. However, after initial analysis it was chosen to leave out the non-binary participants, because the sample size was not representative. Table 5 presents the mean scores given by the participants per attribute and their average score split per accent. For every attribute except 'enthusiastic' the mean scores for the SB accent are all higher than the scores for GA. This suggests that the participants preferred the GA accent for 'enthusiastic', but the SB accent for 'convincing', 'confident' and 'interesting'. The average score is highest for SB.

Table 5: mean scores per accent

	Enthusiastic		**Convincing**		**Confident**		**Interesting**		**Average**	
	GA	**SB**	**GA**	**SB**	**GA**	**SB**	**GA**	**SB**	**GA**	**SB**
Mean	4.44	4.42	4.78	5.41	5.14	5.61	4.16	4.66	4.63	5.02
SD	2.13	1.98	2.19	1.99	2.35	1.96	2.06	2.03	1.94	1.74

Table 6 presents the mean scores for all attributes and their average split per prosody condition. The scores for the high prosody condition are highest for every attribute, including the average score.

Table 6: mean scores per prosody condition

	Enthusiastic		Convincing		Confident		Interesting		Average	
	high	**low**	**high**	**low**	**high**	**low**	**high**	**low**	**high**	**low**
Mean	5.10	3.76	5.39	4.81	5.56	5.18	4.79	4.02	5.21	4.44
SD	2.04	1.85	2.08	2.12	2.18	2.15	2.00	2.04	1.81	1.81

The participants were also asked to indicate whether they preferred a certain accent. Without the non-binary participants included, 26 indicated a preference for SB, 10 for GA, and 14 indicated that they did not have a preference (NP). An overview of the mean scores per accent can be found in table 7. The participants who indicated they did not have a preference ended up rating the SB accent higher than the GA accent (5.22). Interestingly enough, the participants who preferred GA also rated the SB accent higher (4.75) than the GA accent (4.43).

Table 7: Mean scores per accent divided by preference

	GA Accent			SB Accent		
Preference	**GA**	**NP**	**SB**	**GA**	**NP**	**SB**
Mean	4.43	4.94	4.54	4.75	5.22	5.03
SD	1.90	1.65	2.08	1.43	1.52	1.93
Min	1.00	1.00	1.00	1.00	1.25	1.00
Max	8.00	8.00	10.00	7.75	8.75	9.50

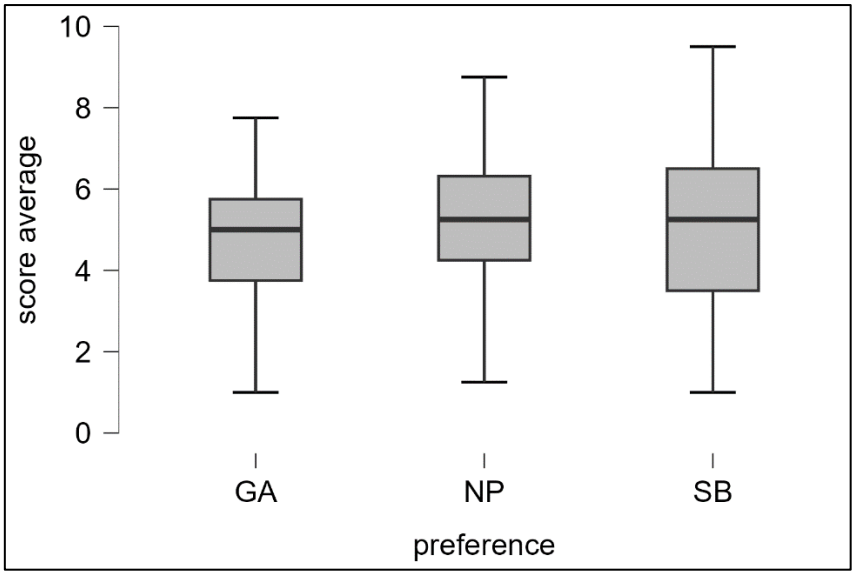

Figure 1: Boxplot containing average scores for SB accent per preference

Figure 1 presents a boxplot for the average scores given for the SB accent divided by preference. In this case the participants without a preference gave the highest average score (5.22). Furthermore, the participants who preferred SB gave higher scores than the participants who preferred GA. The medians of all groups are within close range of each other. The scores given by the participants with an SB presence are more dispersed than those of the participants with a GA preference, or no preference. The scores of the participants with a GA and SB preference are both slightly negatively skewed.

Figure 2 presents a boxplot of the average scores given for the GA accent divided per preference. The participants with a GA preference scored the GA accent with 4.43 points on average. The participants without a preference scored the accent 4.94 on average, and those who preferred SB scored the accent 4.54.

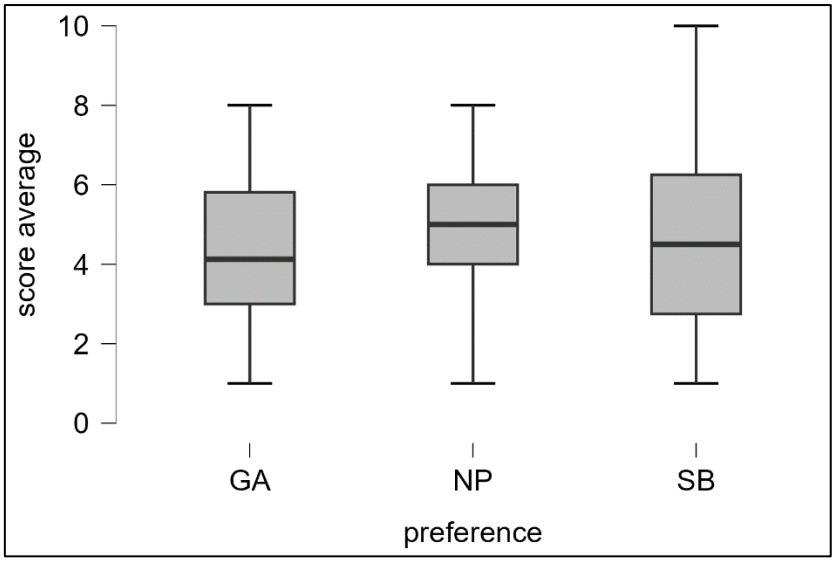

Figure 2: Boxplot containing average scores for GA accent per preference

The statistical analysis was performed in the programme *JASP* (JASP Team, 2024). Linear mixed-effects models were used to estimate the effect of *Accent (*GA, SB), *Prosody* (High, Low) and rater *Gender* (female, male). Each model contained fixed effects of *Accent, Prosody* and *Gender,* and three-way and derived two-way interactions between these effects. *Audio* and *Rater* were listed as random effects grouping factors. If a model revealed a significant interaction, post-hoc comparisons were conducted to compare Estimated Marginal Means (EMMs).

Enthusiastic

For the attribute 'enthusiastic' there was a significant effect of prosody ($F(1, 738) = 97.33$, $p > .001$, $n = 50$). This indicates that the prosody condition had an effect on how the participants scored the speakers on enthusiasm. A post hoc analysis was conducted and EMMs corrected for gender and accent revealed that participants rated speakers much higher on enthusiasm in the high prosody condition (M = 5.23, SE = 0.40, 95% CI [4.44, 6.02]) than in the low prosody condition (M = 3.94, SE = 0.40, 95% CI [3.15, 4.73]). The analysis revealed an estimate of -1.29 (SE = 0.13), which indicates that participants on average scored speakers in the high prosody condition 1.29 points higher than the low prosody condition ($z = -9.87$, $p < .001$). The high prosody condition was coded as -1, and the low condition as 1.

Convincing

The effect of prosody was significant on the scores of the attribute 'convincing' ($F(1, 738) = 12.38$, $p < .001$, $n = 50$). The scores for the high prosody condition ($M = 5.46$, $SE = 0.43$, 95% CI [4.62, 6.30]) were higher than those of the low prosody condition ($M = 4.98$, $SE = 0.43$, 95% CI [4.12, 5.82]). Post hoc analysis corrected for gender and accent revealed that there was a difference of 0.48 points between the two conditions, which was significant as well ($z = -3.52$, $p < .001$). This indicates that participants preferred the high prosody condition over the low prosody condition, regardless of accent or gender.

Furthermore, there was a significant interaction of accent, prosody and gender for the attribute 'convincing' ($F(1, 738) = 6.25$, $p = .013$, $n = 50$). This means that the effect of accent would be different, depending on the gender of the participant and the prosody condition. The same goes for the effect of prosody, this would be different depending on the accent and the gender of the rater. Table 9 presents the EMMs per accent, prosody condition and gender. The mean score of the male participants was the exact same for both GA and SB in the high prosody condition (E = 5.59). However, the highest mean score was for the SB accent in the low prosody condition (E = 5.91). The GA accent in the low prosody condition was scored the lowest (E = 4.66). The female participants scored SB in the high prosody condition the highest (E = 4.98), followed by GA in the high prosody condition (E = 4.98).

Table 8: EMMs per accent, prosody condition and rater gender

Accent	Prosody	Gender	Estimate	SE
GA	High	Male	5.59	0.66
SB	High	Male	5.59	0.66
GA	Low	Male	4.66	0.66
SB	Low	Male	5.91	0.66
GA	High	Female	4.98	0.59

SB	High	Female	5.67	0.59
GA	Low	Female	4.39	0.59
SB	Low	Female	4.96	0.59

Further post hoc analysis revealed significant differences between the means for GA high and GA low for the male participants. Male participants rated the GA accent in the high condition 0.93 points higher than the GA accent in the low condition ($z = -2.73$, $p = .025$). This can be seen in figure 3, where the continuous line represents the male scores. This means that the male participants favoured the high prosody condition in the GA accent. The female participants also preferred the GA accent in the high condition vs the low condition. They scored the high condition 0.60 points higher than the low condition ($z = -3.29$, $p = .004$). Both genders preferred the high prosody condition for the GA accent.

Additionally, the female participants scored the SB accent significantly higher in the high prosody condition than in the low prosody condition. The dotted line in figure 3 represents the scores given by the female participants. The high prosody condition scored 0.71 points higher than the low prosody condition ($z = -3.93$, $p < .001$). This suggests that the female participants prefer the high prosody condition in the SB accent as well, even more significantly so than for the GA accent.

Lastly, there was a significant contrast between the scores male participants gave the GA accent in the high prosody condition, and the scores female participants gave the GA accent in the low prosody condition. The scores that men gave GA in the high prosody condition were 1.2 points higher than the scores women gave GA in the low prosody condition ($z = -2.91$, $p = .014$).

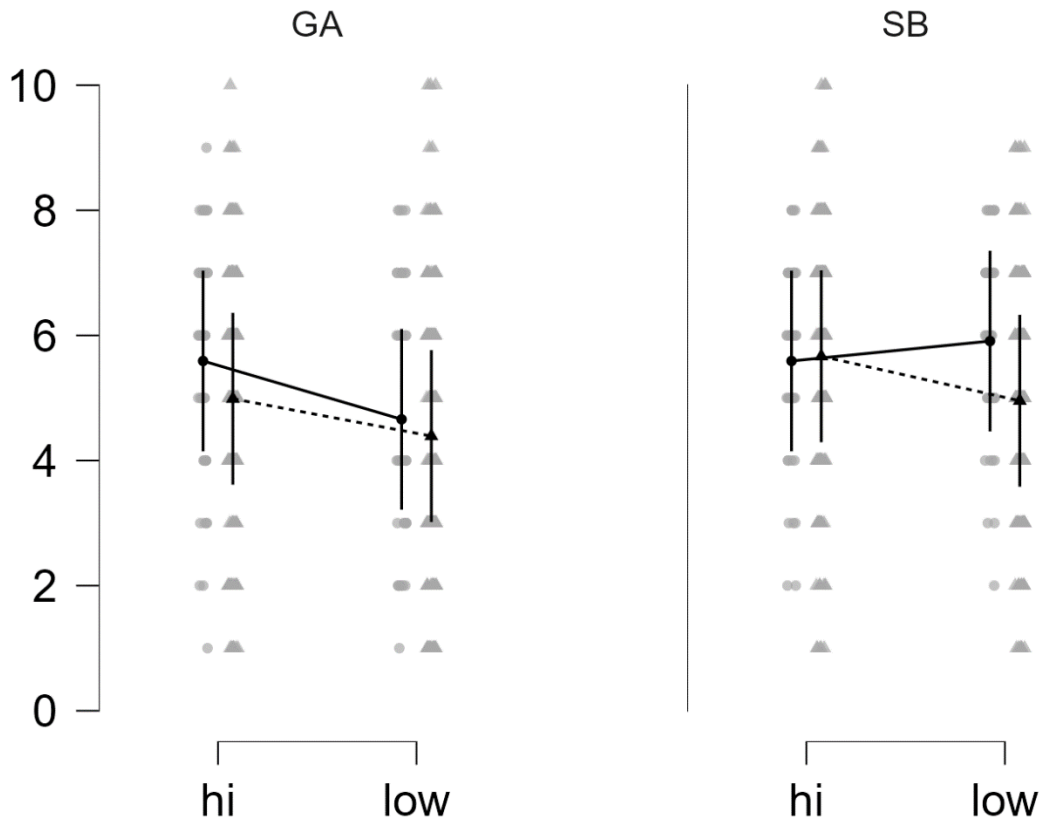

Figure 3: Plot containing the average scores given for 'convincing' per accent by men (continuous line) and women (dotted line), split per prosody condition

Confident

For the attribute 'confident' there was a significant interaction between accent, prosody and gender ($F(1, 738) = 5.16$, $p = .023$, $n = 50$). As seen with the attribute 'convincing', this means that the effect of one of the variables on the scores differs depending on the other variables. The EMMs can be found in table 10. The male participants scored SB the highest in the low prosody condition (E = 6.36), while GA scored the lowest in the low prosody condition (E = 5.16). The female participants scored SB the highest in the high prosody condition (E = 5.73), while GA received the lowest score (E = 4.85). This is interesting, as both groups rated SB the highest, but in different prosody conditions.

Table 9: EMMs per accent, prosody condition and gender

Accent	Prosody	Gender	Estimate	SE
GA	High	Male	5.77	0.74
SB	High	Male	5.86	0.74
GA	Low	Male	5.16	0.74
SB	Low	Male	6.36	0.74
GA	High	Female	5.24	0.67
SB	High	Female	5.73	0.67
GA	Low	Female	4.85	0.67
SB	Low	Female	5.19	0.67

Post hoc analysis revealed that there were significant contrasts between the scores for SB in the low and high condition given by the female participants. This can be seen in figure 4, where the scores given by female participants are represented by the dotted line. The high prosody condition received 0.54 points more than the low prosody condition in the SB accent ($z = -2.94$, $p = .013$). This means that the female participants significantly preferred the high prosody condition in the SB accent.

Additionally, there was a significant contrast between the scores given by the male and female participants for the SB accent in the low prosody condition. The scores given by the male participants are represented by the continuous line in figure 4. The male participants gave 1.17 points higher than the female participants ($z = -2.91$, $p = .015$). According to the EMMs, the SB accent in the low prosody condition received the highest average score for the male participants. The female participants preferred the SB accent over the GA accent in the

low condition, but overall gave the SB accent in the high prosody condition the highest average score.

Figure 4: Plot containing the average scores given for 'confident' per accent by men (continuous line) and women (dotted line), split per prosody condition

Interesting

There was a significant effect of prosody on the attribute 'interesting' ($F(1, 738) = 25.66$, $p < .001$, $n = 50$). This suggests that participants were significantly influenced by the prosody conditions in their rating of how interesting the speaker was. EMMs revealed that the scores for 'interesting' were higher in the high prosody condition (M = 4.93, SE = 0.37, 95% CI [4.20, 5.66]) than in the low prosody condition (M = 4.22, SE = 0.37, 95% CI [3.49, 4.95]). Post hoc analysis confirmed the effect of prosody (z = -5.07, p < .001). Participants rated speakers in the high prosody condition 0.71 points higher than speakers in the low prosody condition (SE = 0.14).

Score average

For all scores averaged, the effect of prosody was significant ($F(1, 738) = 37.18$, $p < .001$, $n = 50$). This suggests that prosody had an effect on the scores overall. EMMs revealed that participants rated speakers higher in the high prosody condition (M = 5.32, SE = 0.41, 95% CI [4.51, 6.12]) than in the low prosody condition (M = 4.63, SE = 0.41, 95% CI [3.84, 5.43]). Post hoc analysis corrected for accent and gender showed that participants scored speakers 0.69 points higher in the high prosody condition (SE = 0.11). The effects of the high and low prosody conditions proved significant ($z = -6.10$, $p < .001$).

Summary

To sum up, analysis using Linear Mixed Models revealed that prosody had an effect on all attributes, either individually or part of a three-way interaction with gender and accent. Generally, the high prosody condition received higher scores than the low prosody condition.

For ‘enthusiasm’, a significant effect of prosody was found. The participants rated the high prosody condition significantly higher than the low prosody condition.

For the attribute ‘convincing’ there was a significant interaction of prosody, as well as a three-way interaction between accent, prosody and gender, which means that the ratings were influenced by the rater gender, as well as the prosody condition, as well as the accent. The male raters significantly preferred GA in the high prosody condition over GA in the low prosody condition for ‘convincing’. The female raters preferred the high prosody condition of SB over the low prosody condition. Lastly, the male raters preferred GA in the high prosody condition over the female raters preferring GA in the low prosody condition. Overall, the raters significantly preferred the high prosody condition.

The ratings for ‘confident’ were influenced by a three-way interaction between accent, prosody, and gender. the female raters preferred SB in the high prosody condition over SB in the low prosody condition. The male raters significantly preferred SB in the low prosody

condition over the female raters. Interestingly, the male raters rated SB in the low prosody condition the highest for ‘confident’, rather than the high prosody condition.

For ‘interesting’ there was a significant effect of prosody on the ratings. The participants preferred the high prosody condition over the low prosody condition.

The average score was also affected by prosody. Overall, the high prosody condition received higher scores than the low prosody condition for every attribute. The only ratings that were different were given by the male participants for ‘confidence’, where they preferred the low prosody condition instead of the high prosody condition.

Discussion

Firstly, the results will be discussed in relation to the research mentioned in the literature review. Then, the research questions will be answered.

The definition of charisma

The current study used four attributes to define charisma, having taken inspiration from Tuppen, (1974), Rosenberg & Hirschberg (2009), Brem & Niebuhr (2021) and keeping in mind the proposed definitions by Weber (1968), and Antonakis et al. (2016). The definition proposed by Weber was: “charisma means that an extraordinary, at least not generally available, quality adheres to a person” (p. 194). Antonakis et al. (2016) came up with a definition that was more suitable for empirical research: “charisma is values-based, symbolic and emotion-laden leader signalling” (p. 304). Previous research had encountered problems, as it was unclear what exactly would be researched when looking at charisma. Brem & Niebuhr (2021) also encountered problems with unclear definitions for respondents, leading to inconclusive results. As such, it was chosen to use the four constructs ‘enthusiastic’, ‘convincing’, ‘confident’ and ‘enthusiastic’ in the current study. These definitions were clear to respondents, while also ensuring that they did not directly rate the concept of charisma

itself, as it has been shown that respondents have different definitions of charisma in mind, leading to inconclusive results.

All attributes revealed conclusive results. Following the questionnaire, there was an opportunity for participants to indicate whether they misunderstood or disagreed with any of the questions. None of the participants indicated that they had trouble with the definitions of the attributes.

The attribute ‘enthusiastic’ was found to be correlated with charisma in Rosenberg & Hirschberg (2009). In Brem & Niebuhr (2021), ‘passionate’ was used instead of ‘enthusiastic’. However, both concepts are closely related in terms of definition. In this case, ‘enthusiastic’ was chosen because Rosenberg & Hirschberg (2009) provided a stronger analysis and argument for correlation with charisma. The results of the current research indicated that participants gave higher scores for ‘enthusiastic’ if the speaker used the high prosody condition. This means that speakers were regarded as more enthusiastic if they used a higher pitch and spoke at a faster rate.

‘Convincing’ was found to be correlated with charisma in Tuppen (1974), Rosenberg & Hirschberg (2009) and Brem & Niebuhr (2021). The results for ‘convincing’ indicated that it was influenced by prosody and accent, as well as rater gender, suggesting that it was, as argued by the literature, a strongly correlated attribute of charisma. The participants gave higher scores for ‘convincing’ when the speaker used the high prosody condition. The male participants gave the highest scores for GA in the high prosody condition. The female participants also gave high scores for GA in the high prosody condition, but preferred SB in the high prosody condition even more. This means that all the participants found the speakers the most ‘convincing’ in the high prosody condition, but the male participants found GA more convincing and the female participants found SB more convincing.

The basis for choosing ‘confident’ was not provided by Brem & Niebuhr (2021) or Rosenberg & Hirschberg (2009), but rather inspired by Tuppen (1974). The definition of a charismatic speaker proposed by Tuppen (1974) was: “a communicator who is thought of as convincing, reasonable, right, logical, believable, intelligent, respected in their opinion, whose background is admired, and in whom the reader has confidence” (p. 257). However, as explained by Antonakis et al. (2016), charisma should not be studied through its effects but rather what makes a speaker charismatic. Therefore, it was chosen to see how ‘confidence’ would be judged if the prosody of the speaker was altered, and if they would be considered more or less confident in the different prosody conditions. Initially, ‘passionate’ was included as an attribute instead of ‘confident’, but after piloting the questionnaire, participants indicated that ‘passionate’ and ‘enthusiastic’ were too closely related, and that ‘confident’ would be more important for a charismatic speaker. As the research by Tuppen (1974) suggested a link between charisma and confidence, it was chosen to use this attribute. The results of the current research indicated that male participants gave higher scores for confidence if the speaker used an SB accent and spoke in the low prosody condition. The female participants gave higher scores for confidence to the high prosody condition, but also preferred the SB accent. This suggests that participants found the SB accent to sound more confident, but differed per gender in which prosody condition they preferred.

Lastly, ‘interesting’ was chosen as an attribute. This was not found to be correlated with charisma in the abovementioned studies. However, Rosenberg & Hirschberg (2009) found a negative correlation between ‘boring’ and charisma, and this was also mentioned by Biadsy et al. (2008) as being an important attribute to American and Swedish raters. This suggests that a speaker is not considered charismatic if they are considered boring. That is why ‘boring’ was first included as an attribute in the current study. However, as all the other attributes ‘enthusiastic’, ‘convincing’ and ‘confident’ were positively correlated, and

therefore also positively rated by the participants, it was confusing to have participants rate ‘boring’ as well, as they would have to positively rate the other 3 attributes if they found a participant to be charismatic, but negatively rate ‘boring’. As such, the antonym of ‘boring’ was chosen: ‘interesting’. This yielded significant results. Participants gave much higher scores for ‘interesting’ when the speaker used the high prosody condition. There was no effect of accent. This means that speakers should use a higher pitch and faster speaking rate in order to be seen as more ‘interesting’.

Pitch

In the current experiment, the pitch level of the speech in the stimuli was adjusted by 10%, creating a low prosody condition that was 10% lower in pitch, and a high prosody condition which was 10% higher in pitch. Previous research had found that the perception of charisma was higher when the mean and the standard deviation of f0 were greater (Hirschberg & Rosenberg, 2005). In this paper it was chosen to alter the mean pitch level. As for variation in pitch level, this could not be altered in the available stimuli. Hirschberg & Rosenberg (2005) found that a higher pitch was seen as more charismatic. In their study, only male speakers were included. However, the current study found that participants preferred the high prosody condition in almost all cases, except for the male participants when rating ‘confidence’ in the SB accent.

The literature review furthermore discussed the shaping of pitch accents as researched by Niebuhr, Thumm & Michalsky (2018). The question addressed in the research was whether a generally higher pitch contributed more to the perception of charisma, or if the shaping of pitch accents contributed to this as well. The results indicated that both a raised f0 level and a convex shape of the higher pitch accents contributed to the perception of charisma. As such, it was chosen to generally increase the pitch level of the stimuli.

However, the study by Brem & Niebuhr (2021) found that female speakers should decrease their pitch level in order to be perceived as more charismatic. In this study, the stimuli were manipulated to create a high and low prosody condition. In the low prosody condition, the pitch level was decreased by two semitones, and in the high prosody condition the pitch level was increased by two semitones. Four female speakers were included, and the interaction of prosody and attire was studied. For two of the speakers, the participants found the low prosody condition in combination with expressive attire most charismatic. For the other two speakers, the high prosody condition in combination with conservative attire was judged as more charismatic. Through post-test questionnaires it was found that there was visual interference: the raters found two of the speakers much more attractive than the other two. The attractive speakers benefited from the low prosody condition, and the 'less' attractive speakers benefited from the high prosody condition. That is why it was ensured that there was no visual stimulus in the current experiment. The results of the current research indicate that the high prosody condition remains the most charismatic. Therefore it seems that the use of low prosody is beneficial for female speakers only in combination with expressive attire and if they are judged to be attractive.

Speaking Rate

Research by Hirschberg & Rosenberg (2005) found that a faster speaking rate indicates charisma. This comes with a note: it might not necessarily be that a speaker with a fast speaking rate is more charismatic, but a slow speaker that sounds hesitant or doubting. As charismatic speakers need to sound sure of themselves, it follows that speakers that sound slow, and thus hesitant, are not seen as charismatic. The results of the current study indicate that participants preferred a higher speaking rate for 'enthusiastic', 'convincing', 'confident' and 'interesting'. Only the male participants preferred the low prosody condition, with a slower speaking rate, for the attribute 'confident' in the SB accent. However, the effects of

speaking rate and pitch cannot be analysed independently, as both were manipulated to create different prosody conditions. Therefore, it is not certain that the effects found are entirely due to a higher speaking rate.

Again, the research by Brem & Niebuhr (2021) contradicts this. They found that the low prosody condition was seen as more charismatic, but this was found in combination with expressive attire, and a bias towards the looks of the female speakers. This suggests that there is a need for research that looks into how female speakers are judged differently on charisma based on their level of attractiveness to the listener. Nonetheless, without visual stimuli participants preferred a higher speaking rate for speakers to convey enthusiasm, convincingness, confidence and sound interesting.

Articulation & Intensity

Though articulation and intensity were mentioned in the literature review as being relevant prosodic features for charismatic speech, they were not manipulated in the stimuli used in this study. There is research that has investigated which prosodic parameters contribute most significantly to the perception of charisma (Niebuhr & Skarnitzl, 2021), and it was found that pitch is one of the most important parameters. Additionally, the availability of stimuli did not allow for manipulation of articulation. More importance was attributed to ensuring that the stimuli were from real speakers, not generated by text-to-audio synthesis, and that there was no visual interference which might bias raters. As a result, it was chosen to manipulate pitch and speaking rate, as seen in Brem & Niebuhr (2021).

Charisma perception of GA/SB speakers by Dutch participants

Previous research on charisma perception and culture found that speakers are considered to be the most charismatic when they express themselves in line with cultural values (Gutnyk, Niebuhr & Gu, 2021). In this case, it would be expected that SB speakers would be closer to the culture of Dutch participants than GA speakers. However, much of

these cultural values are expressed through lexical content in speech. In this experiment, the lexical content of the stimuli was identical. Therefore, the raters would be more strongly influenced by the prosodic features of the speech. Prosodic values can convey cultural values as well: speakers with a slower speaking rate are thought of as more confident, and speakers with a higher pitch can be seen as expressing more emotions of enthusiasm. If these attributes are valued in a culture, they will be considered more charismatic.

Biadsy et al. (2009) found that raters from the US value passion and convincingness in a charismatic speaker. They also preferred a slower speaking rate. This is at odds with the ratings given by the Dutch participants in the current project, as the high prosody condition with the higher speaking rate and higher pitch was preferred over the low prosody condition.

It is likely that Dutch participants are culturally closer to German raters than American raters. Gutnyk, Niebuhr & Gu (2021) found that German raters preferred a higher pitch and fewer silent pauses. The Dutch participants also preferred a higher pitch and a faster speaking rate. Silent pauses can contribute to a slower speaking rate, so if silent pauses are not preferred, it follows that a higher speaking rate is more appreciated.

Furthermore, D'Errico (2013) made a distinction between impulsively oriented cultures and institutionally oriented cultures. This affects how a culture regulates its emotions, and therefore which attributes are appreciated in a charismatic speaker. D'Errico compared France and Italy. France is considered an institutionally oriented culture, where it is preferred to discuss topics indirectly. Italy is considered an impulsively oriented culture, where emotions are less regulated. Though France is closer to the Netherlands geographically, in this case it seems that the Netherlands shares Italy's values. Dutch people are known to be honest and bold, which is more suited to an impulsively oriented culture than an institutionally oriented culture. In these cultures, short pauses and a normal or heightened pitch are valued in a speaker. As mentioned before, the results of the current research found

that Dutch raters prefer a high prosody, which is a higher pitch and faster speaking rate and a GA accent. The only exception was found for male raters when judging confidence: they preferred a low prosody and an SB accent. The female raters also preferred an SB accent, but with high prosody. This means that the male participants differ in their prosody preference when it comes to the attribute ‘confident’. A possible explanation for this is that male raters prefer a lower pitch and a slower speaking rate because men generally speak in a lower pitch than women. Additionally, it was mentioned that a faster speech rate only contributes to charisma if it is not too fast (Rosenberg & Hirschberg, 2009; Berger, Niebuhr & Peters, 2017). It is possible that the pitch and speaking rate in the high prosody condition were considered too high to be judged ‘confident’ by the male raters, resulting in a preference for the low prosody condition. As for why the raters preferred the SB accent over the GA accent when it comes to ‘confident’, it is possible that this can be linked to research surrounding accent attitudes. Previously it was found that German participants see an SB accent as more competent, while a GA accent is seen as more socially preferable (Davydova, 2015). As such, it is likely that speakers must be considered competent in order to be considered confident, and that the accent they speak in influences this.

As for which accent the raters preferred more, the average scores revealed that SB was usually rated higher. However, not many of these scores were found to be significant. There were also no individual effects of accent on the ratings. There was only an effect of accent when it was included in a three-way interaction with prosody and rater gender. Therefore, it seems that prosody had a stronger influence on charisma perception than accent did.

Research Questions

Lastly, the research questions that will be answered are:

1. Does having a General American (GA) or Standard British (SB) accent affect perceived charisma in female speakers?
2. Does the prosody used by the speaker affect perceived charisma in female speakers?
3. Does the rater gender influence charisma ratings of female speakers?

The Effect of Accent (RQ1)

The scores given per accent were different. For all attributes, SB received higher scores than GA, except for 'enthusiastic'. This suggests that raters preferred GA over SB when they wanted a speaker to sound enthusiastic. For 'convincing', 'confident' and 'interesting' they preferred SB. However, the General Linear Model did not reveal any significant effects of accent on the scores for 'enthusiasm', only the average scores reveal that raters rated SB higher than GA.

Enthusiastic

The fact that there was no effect of accent suggests that raters do not focus on accent whilst judging 'enthusiasm', suggesting that 'enthusiasm' is present due to other features in speech such as prosody, not influenced by accent.

Convincing

For the attribute 'convincing' there was a significant interaction between accent, prosody and rater gender. This means that the accent, prosody and rater gender all influenced the scores for how 'convincing' a speaker sounded to them. The analysis indicates that the male raters judged SB and GA similarly in the high prosody condition, and preferred SB in the low prosody condition. The highest score was given to SB in the low prosody condition. The female raters preferred SB over GA in both the high and the low prosody condition. Their highest score was given to SB in the high prosody condition.

However, the scores that were significant were those of the male raters for the GA accent. Though the average scores revealed that they rated SB higher, this difference was not

significant. There was a significant difference between the high and low conditions of the GA accent. This means that prosody had a significant interaction on how ‘convincing’ GA speakers sounded to male raters, but not SB speakers. The same effect occurred for the female raters: there was a significant effect of prosody on how ‘convincing’ the GA speakers sounded. However, the female raters also significantly preferred the high prosody condition for the SB speakers to sound ‘convincing’ over the low prosody condition.

Lastly, the attribute ‘convincing’ was rated differently by male raters in the high prosody condition for the GA accent, and female raters in the low prosody condition for the GA accent. The male raters rated ‘confident’ significantly higher for GA in the high prosody condition than female raters did for GA in the low prosody condition.

The interactions suggest that the GA accent had the strongest effect on ‘convincing’ scores, rather than SB, even though the average scores given to SB were higher. Additionally, the effect of GA was influenced by the prosody condition and the rater gender.

Confident

For ‘confident’ there was also a significant interaction between accent, prosody and gender. Again, the male participants scored SB higher in both the high and low prosody condition. The female participants scored SB higher in both conditions as well. The male participants gave the highest score to SB in the low prosody condition, while the female participants gave the highest score to SB in the high prosody condition.

The difference between the scores given to SB in the high and low prosody condition was significant for the female raters. This means that female raters prefer SB in the high prosody condition when it comes to how ‘confident’ a speaker sounds. There was another significant difference between the male and female raters: the male raters rated SB significantly higher in the low prosody condition than female raters rated SB in the low

prosody condition. This suggests that the male raters preferred SB in the low prosody condition for speakers to sound ‘confident’.

Interesting

There were no significant effects of accent for ‘interesting’, which suggests that accent did not influence how ‘interesting’ a speaker sounded to the raters.

Score average

The score average did not reveal an effect of accent. This suggests that accent overall did not influence the ratings, but rather did so on an individual attribute level.

Thus, the research question can be answered: does having a GA or an SB accent affect perceived charisma in female speakers? It does, but only when considering attributes such as ‘convincing’ and ‘confident’. Raters preferred GA for ‘convincing’ and SB for ‘confident’. This suggests that both accents contribute to charisma, but to different facets of it. However, the average score revealed no overall effect of accent.

The Effect of Prosody (RQ2)

The average scores per prosody condition revealed that the high prosody condition was preferred for all attributes. This suggests that a high prosody condition contributes more to a perception of charisma than the low prosody condition. The high prosody condition was created by manipulating the speakers to speak 10% faster, and raise their pitch by 10%.

Enthusiastic

There was a significant effect of prosody on the attribute ‘enthusiastic’. This means that the prosody used contributed more to the perception of how enthusiastic the speaker was. The high condition was preferred. This means that the raters found the high prosody condition to contribute more to the perception of enthusiasm in the speaker. There was no effect of accent or rater gender.

Convincing

For the attribute ‘convincing’ there was a significant individual effect of prosody, and a significant interaction between accent, prosody and rater gender. The high prosody condition was preferred for a speaker to convey ‘convincingness’.

The interaction between accent, prosody and rater gender revealed that the high prosody condition was favoured for ‘convincing’. The scores given by the male raters indicated that they significantly preferred GA in the high prosody condition. There was no significant difference between prosody conditions for SB. The female raters also preferred the high prosody condition, and they preferred it for both GA and SB. Lastly, there was an interesting difference between the male and female raters: the male raters rated GA in the high prosody condition significantly higher than the female raters in the low condition.

Overall, it seems that the high prosody condition contributed most significantly to the perception of ‘convincingness’ for the speakers. However, the male attributes only preferred the high condition for the GA accent. They did not significantly prefer any prosody condition for the SB accent. The female raters preferred the high prosody condition for both GA and SB.

Confident

There was a significant effect of accent, prosody and rater gender on the scores for the attribute ‘confident’. As with ‘convincing’, the high prosody condition received higher average scores than the low prosody condition. The female raters preferred SB in the high prosody condition. There was no significant effect of prosody for the GA accent. This suggests that prosody is important to convey ‘confidence’ in the SB accent, but not the GA accent. There was also a significant contrast between the scores given by the male raters to the SB accent in the low prosody condition, and the scores given by the female raters for SB in the low prosody condition. The male raters gave the highest ratings to SB in the low

prosody condition. This suggests that male raters prefer the low prosody condition to convey ‘confidence’, but only in the SB accent. Female raters prefer the high prosody condition to convey confidence.

Interesting

For the attribute ‘interesting’ there was a significant effect of prosody. The participants rated speakers as more ‘interesting’ when they used the high prosody condition. This means that a higher speech rate and a higher pitch contributed to sounding more interesting. There were no effects for accent or rater gender.

Score average

There was a significant effect of prosody on the average score. This means that the prosody a speaker uses affects their perceived charisma. Overall, the high prosody condition was preferred over the low prosody condition. This means that a faster speaking rate and a higher pitch were considered to be more charismatic.

The second research question concerned whether or not prosody affects the perception of charisma. For all attributes there was an effect of prosody, either an individual effect or in an interaction. The results indicate that high prosody contributes more to the perception of charisma than low prosody. However, there is one exception: the male raters preferred the low prosody condition in SB for ‘confidence’. So, there is an overall effect of prosody, and generally the high prosody condition is preferred. However, for confidence a slower speech rate and lower pitch contribute more to charisma, when the audience is male.

The Effect of Rater Gender (RQ3)

There is reason to believe that the rater gender affects the way speakers are judged. The speaker gender also influences this. Male raters are suggested to rate female speakers differently than female raters would rate female speakers. The results from the current

research project also indicate that there is a difference in how male and female raters judge speakers.

Convincing

For the attribute ‘convincing’, there was a significant interaction between accent, prosody, and gender. Male raters preferred the high prosody condition for the GA accent, and female raters preferred the high prosody condition for both SB and GA. This means that female raters seemed more sensitive to the prosody conditions in SB than the male raters, because female raters were significantly affected by prosody in their scoring of SB while male raters were not.

The second contrast was between the scores given by the male raters for GA in the high prosody condition and the scores given by the female raters for GA in the low prosody condition. This suggests that the male raters very significantly preferred the high prosody condition over the female raters preferring the low prosody condition. It seems as though the male raters more positively judged the high prosody condition, while the female raters more negatively judged the low prosody condition.

Confidence

There was an interaction between accent, prosody and gender for the attribute ‘confident’. The female raters preferred SB in the high prosody condition. The male raters preferred SB in the low prosody condition. This contrast was significant, as the male raters gave the low prosody condition much higher scores than the high prosody condition. This suggests that the male raters preferred the low prosody condition for confidence in SB, while female raters preferred the high prosody condition for confidence. The low prosody condition consists of a slower speaking rate and a lower pitch, which could convey a more ‘masculine’ type of charisma. Male speakers generally employ a lower pitch than female speakers. It is possible that male raters preferred a lower pitch because this sounds more masculine. On the

other hand, a faster speaking rate and higher pitch convey more emotions such as enthusiasm, which can also be seen as charismatic. As for the preference of SB by all raters, it is likely that this is linked to the perception of accent. An SB accent is considered to convey competence, while a GA accent is important to be seen as likeable (Davyhova, 2015). In this case, competence is likely to contribute to the perception of confidence, which is why SB might be preferred over GA.

There were no effects of gender found for the attributes ‘enthusiastic’, ‘interesting’ or the score average.

The research question ‘does rater gender influence charisma ratings of female speakers?’ can be answered with a yes, but only for certain attributes. When considering the average score, there does not seem to be a significant effect of rater gender. However, attributes such as convincingness and confidence were affected by rater gender. It seems that attributes like ‘enthusiastic’ and ‘interesting’ were judged similarly by both men and women.

Conclusion

This paper gave an overview of the research on the prosodic characteristics of charisma and the challenges that accompany it. The term ‘charisma’ coined by Weber (1968) is still young, leading to confusion as to its exact meaning. Previous research had looked at charisma in terms of its effects (Antonakis et al., 2016), but more recent empirical research focused on defining charisma by its attributes, allowing for a clearer definition that led to conclusive ratings. The current research chose to four attributes to study charisma: ‘enthusiastic’, ‘convincing’, ‘confident’ and ‘interesting’.

The research on charisma has also revealed biases in terms of gender. It has been posited that it is beneficial to use a higher pitch and a faster speaking rate, but female speakers were not included in this research (Rosenberg & Hirschberg, 2009). When female speakers were included, the conclusions were often divided, and the results were influenced

by visual interference (Brem & Niebuhr, 2021) or rater gender (Niebuhr, Skarnitzl & Tylecková, 2018).

Additionally, there is a body of research that looks into the perception of charisma in different cultures. It has been found that American raters prefer charismatic speakers to have different attributes than Palestinian raters (Biadsy et al., 2008). Similarly, French speakers prefer more silent pauses in their speech than Italian speakers (D'Errico et al., 2013). Furthermore, native accents are perceived differently than non-native accents (Davydova, 2015). As such, there was a need to address gaps in the research concerning the prosodic features in female charismatic speech, as well as the influence of accent.

This research addressed questions concerning the effect of accent, prosody and the rater gender on charisma perception. An experiment was set up using stimuli from the IDEA Corpus (2024). These stimuli were manipulated to create a high prosody condition, where the speaker's speaking rate and pitch were heightened, as well as a low prosody condition, where the speaker's speaking rate and pitch were lowered. The manipulation of these stimuli was based on previous research investigating the influence of different prosodic parameters such as pitch, speaking rate, articulation and intensity on the perception of charisma. Participants rated four attributes: enthusiastic, convincing, confident, and interesting.

The statistical analysis revealed that participants rated the high prosody condition as more charismatic for all attributes. For convincing and confident, participants preferred the GA accent over the SB accent. The only exception was for the male raters: they preferred the low prosody condition and the SB accent for confidence.

These results show that there is a need for more research into the interaction between prosody and accent, as well as how rater gender influences this. Male and female raters judge female speakers differently, especially in the dimension 'confidence'.

It must be noted that this research was limited in a number of factors such as the number of participants, and the ratio of female to male participants. Though there were only 11 male raters and 39 female raters, an effect of rater gender was found. Initially, 3 non-binary participants had been included, but because these participants were too few to be representative it was chosen to only include male and female participants. Furthermore, a large number of raters did not pass the attention check. Nonetheless, the current research found significant results pertaining to the effect of prosody, accent, and rater gender on the perception of charisma in female speech. It was found that prosody has a significant effect on all attributes, while accent only influenced how confident and convincing raters found the speaker to be. This suggests that both prosody and accent are relevant for charisma perception, but that prosody has a stronger influence than accent.

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Appendix A: Questionnaire

Dankjewel voor het invullen van deze vragenlijst voor mijn MA scriptie! Het zal ongeveer 10-15 minuten van je tijd innemen.
Je zal gevraagd worden om een aantal Engelse sprekers te beoordelen op hoe enthousiast, overtuigend, zelfverzekerd en boeiend ze klinken. Ze zullen allemaal dezelfde zin uitspreken. Het gaat dus niet om de inhoud van de zin, maar om hoe ze in jouw oren klinken terwijl ze deze uitspreken.
Onthoud ook dat het niet de bedoeling is dat deze sprekers met elkaar vergeleken worden, en dat we graag jouw subjectieve mening per spreker willen.
Voordat je begint aan de vragenlijst, zorg ervoor dat je het geluid goed kan horen. De opnames spelen automatisch af per pagina en kunnen niet herhaald worden.

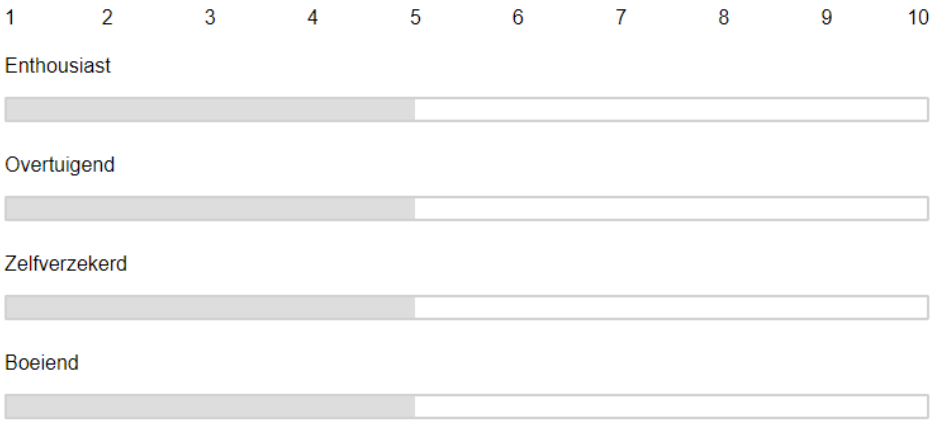
Deelname aan dit onderzoek is anoniem en vrijwillig. Als je meedoet, mag je op elk moment tijdens de opdrachten stoppen. De verzamelde data wordt anoniem bewaard en verwerkt. Jouw toestemming is vereist om deel te nemen aan dit onderzoek. Als je de bovenstaande informatie hebt gelezen en het hiermee eens bent, geef dan je toestemming door "JA" aan te klikken:

- JA, ik heb bovenstaande informatie gelezen en ga akkoord met deelname aan de studie.

Zorg dat je het geluid op je laptop/telefoon goed kan horen, door een koptelefoon te gebruiken of ervoor te zorgen dat je op een plek bent waar je het geluid hard genoeg kan zetten.

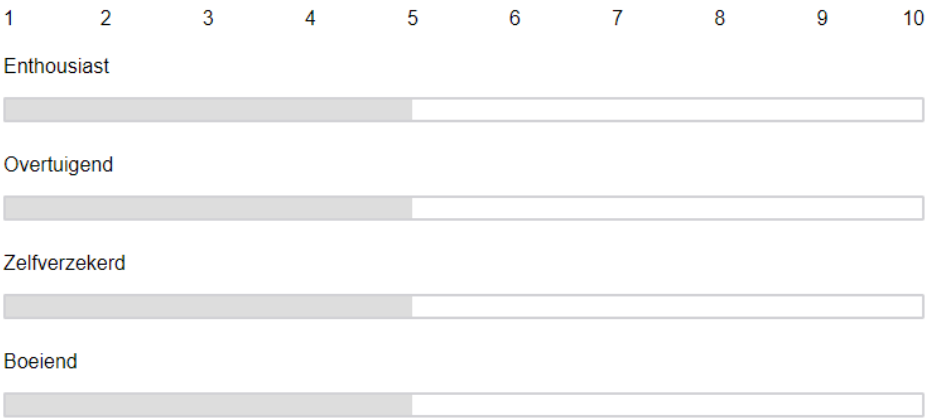
We beginnen met een test audio, deze zal automatisch spelen zodra je doorklikt naar de volgende pagina.
Voor gebruikers van Safari: autoplay werkt niet vanzelf. Klik op de volgende pagina ergens met je muis om de audio af te laten spelen. Voor het beste resultaat is het gewenst een andere browser te gebruiken.

Gebruik de sliders/schuifregelaars om de spreker te beoordelen op de genoemde eigenschappen op een schaal van 1-10. Een score van 10 betekent 'heel erg enthousiast', en een score van 1 betekent 'helemaal niet enthousiast'.



Als je audio goed werkte en je geen andere problemen ervaarde, ga dan verder naar het experiment.

Repeated for each of the stimuli:
Gebruik de sliders/schuifregelaars om de spreker te beoordelen op de genoemde eigenschappen op een schaal van 1-10.



Wat is je leeftijd?

Wat is je gender/geslacht?

- Vrouw
- Man
- Non-binair
- Deel ik liever niet

Om mee te doen aan dit experiment moet Nederlands je moedertaal zijn. Selecteer ‘JA’ als dit zo is.

- JA, Nederlands is mijn moedertaal

Geef aan hoeveel jaren je Nederlands gebruikt/spreekt.

Geef aan op welke leeftijd je begon met Engels leren.

Geef aan hoeveel jaren je Engels gebruikt/spreekt.

Presented once for Dutch and once for English: Op een schaal van 1-10, geef aan welke score je jezelf zou geven voor lezen, schrijven, luisteren en spreken in het Nederlands/Engels.

Heb je Engels geleerd in een Brits of een Amerikaans accent?

- Brits accent
- Amerikaans accent
- Niet van toepassing

Heb je voorkeur voor een Brits of een Amerikaans accent?

- Brits accent
- Amerikaans accent
- Niet van toepassing

Hoor je vaker een Brits of een Amerikaans accent in je vrije tijd? (e.g. films/series kijken, muziek luisteren, sociale media)

- Brits accent
- Amerikaans accent
- Ongeveer 50/50
- Weet ik niet zeker

Hoor je vaker een Brits of Amerikaans accent in je professionele leven? (e.g. werk vergaderingen, lessen op school, colleges)

- Brits accent
- Amerikaans accent
- Ongeveer 50/50
- Weet ik niet zeker

Heb je opmerkingen of vragen na het invullen van de vragenlijst?

Heel erg bedankt voor het invullen van deze vragenlijst!