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PREFERENCE OF VOICE AND PERFORMANCE STYLE IN RADIO ADVERTISING

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Abstract. This study sought to find out which style of radio advertisement performance listeners consider likable, and which acoustic features differentiate the likable from the unlikable. The same spokespersons presented a gender neutral pretend-advertisement in two styles: calm and energetic. Listeners had to rate the likability of the performances. The results showed that listener likability scores were consistent and did not depend on listener gender. The listeners overwhelmingly preferred advertisements presented in a calm style, regardless of the performer or their age or gender. For each advertisement, 88 parameters of the extended Geneva Minimalistic Acoustic Parameter Set (eGeMAPS) were calculated. Most of these significantly differentiated likable and unlikable performances. Likable performances were characterised by lower pitch, faster articulation rate, a quieter voice with no abrupt changes in loudness, and a breathy voice. The study showed the importance of determining which performance style listeners prefer, as the voice of the performer is directly affected by the performance style. Listeners might like a voice in one style, but not the other.*

Keywords: radio commercials, speaking styles, voice likability, speech perception, acoustic features, GeMAPS

1. Introduction

Advertising surrounds us constantly. No matter whether it is commercial, political, or public sector, the goal of advertising is to affect and shape our decisions, behaviours, attitudes, and habits. Advertising thus plays an important role in directing daily choices and patterns of behaviour.

Radio advertising is one of the most effective ways of reaching a wide audience regardless of location, as radio is often played in the background in shopping centres, gyms, cars and is even listened to while walking in the street. According to

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the EBU (2022), time spent listening to the radio has decreased in the last decade, yet radio still reaches 84% of European citizens weekly, who listen to it on average for 2 hours and 22 minutes per day. In the EU, radio is considered one of the most trustworthy mediums (Papathanassopoulos et al. 2023). Therefore, it is to be expected that large sums continue to be spent on radio advertising (Majidi 2023).

In a media environment oversaturated with information and stimuli, advertisers have been searching for ways to form trustworthy relationships with consumers and to create positive feelings regarding advertising (Benavides, Van Weezel 2013). Radio advertising research has primarily focused on aspects of advertising such as effectiveness (e.g., Allan 2007, Martín-Santana et al. 2017, Rodero 2017, Wiener and Chartrand 2014), credibility (e.g., Reinares-Lara et al. 2016) and persuasiveness (e.g., Dubey et al. 2018). Less research has been done into how to ensure that the advertising is listened to, that it does not disturb the listener or lead to switching stations during radio-advertising breaks, which often happens according to Michelon et al. (2020). Research by Chattopadhyay et al. showed that it is possible to use voice selection to attract the attention of the consumer, which can help the advertisement rise above background noise and increases the likelihood that the information in the advertisement reaches the listener, but "due to lack of guidance from the marketing literature, managers must rely on gut feel when choosing a voice" (2003: 198). Almost twenty years later, the situation where there are almost no studies on voice in advertising, and the selection of the type of voice is mostly done by intuition, is also noted by Rodero and Larrea (2021), who observe that the importance of the selection of the voice type should not be underestimated, because the voice not only influences the attentiveness of the listener and their desire to receive information but also has a strong emotional impact on the listener. The voice also transfers the effects of its character to the brand (Westermann 2008).

To draw attention to the advertisement and create a positive attitude towards the product, celebrities are often selected as spokespersons (Grigaliūnaitė, Pilelienė 2015). The voices of celebrities are generally perceived as more likable than non-celebrities (for example, regular consumers), and that can enhance different kinds of engagement with media (Vinney, Vinney 2017). Yet the use of celebrities may be detrimental to the efficiency of the advertisement, as a vampire effect may occur, where the celebrity draws the attention from the product to themselves (Erfgen et al. 2015, Kuvita, Karlíček 2014). On the other hand, the celebrity may be not liked and therefore becomes the primary reason why the entire advertisement is disliked (Fam et al. 2013).

Spokespersons are also chosen by gender: in radio advertisements, male voices dominate, as there is a belief that they are more credible, while use of female voices is less common (Rodero, Larrea 2021). A study by Rodero et al. (2013) on the influence a radio spokesperson's gender has on the ability to attract listeners' attention in Spanish radio advertisements found that the over-representation of male voices in advertisements was unjustified: both male and female voices were equally effective and had a similar ability to capture the listener's attention. The study noted a cross-over effect: women were especially susceptible to male voices, which they considered more pleasant, persuasive, and authoritative, and men were more receptive to the female voice, which they considered generally more effective and specifically more pleasant, clearer and more persuasive (Rodero et al. 2013).

The listener's gender preference in Spanish radio advertising has also been studied by Martin-Santana et al. (2015, 2017), who showed that, for nongender-imaged products, the gender of the spokesperson had no significance, but the listeners' preference was for lower-pitched voices, whether male or female. Lower voices created a more positive attitude towards the speaker, and such voices were associated with professionalism and credibility. A study on advertisements in the USA showed that people's attitudes towards an advertisement for a gender-neutral product did not depend on the gender of the spokesperson (Whipple, McManamon 2002). The choice of male or female voices in advertising should be thoroughly considered, depending on the issue and target audience (Searles et al. 2020).

Although some voices or voice types are favoured in advertising, there is little evidence to explain which acoustic features influence it or whether there are features that reduce a voice's effectiveness (Dahl 2010). Most attention has focused on fundamental frequency (pitch) and speech rate. An overview of previous studies by Rodero and Larrea (2021) has shown that, for both genders, lower voices in general are considered more pleasant, credible, competent, confident, dominant, attractive, more comfortable to listen to and more intelligible. A preference for lower voices has been evidenced by both research on advertising but also by general studies on voice likability and attractiveness (e.g., Chattopadhyay et al. 2003, Dubey et al. 2018, Klofstad et al. 2012, Martín-Santana et al. 2015, Rodero et al. 2013, Weiss, Burkhart 2012), yet this may not always be the case: there are studies where lower voices were only preferred for men and not women (e.g., Tsantani et al. 2016) and vice versa, a low voice was important for women but not men (e.g., Babel et al. 2014). Voice preference may also depend on the culture (e.g., Baus et al. 2019, Pajupuu et al. 2019, Weiss et al. 2021b).

The scope of a study by Chattopadhyay et al. (2003) covered both the pitch of the spokesperson as well as their speaking rate. The study showed that listeners paid more attention to an advertisement read at a normal speech rate as opposed to a fast rate. When the speech rate was high, listeners found a low-pitched voice more attractive and credible, as it created more favourable advertisement-directed emotions. Speech rate has also been the focus for Rodero (2020), whose study showed that, for listeners of radio advertisements, the most acceptable speech rate was moderate (180 words per minute for Spanish). Ebrahimi et al. (2018) have noted the same from the viewpoint of advertisement quality: a fast speech rate and very monotone expression reduce the quality of the advertisement. Very low male voices may also become monotonous, which is why they may not be suitable to represent a brand (Rodero, Larrea 2021). Considering voice likability, listeners tend to prefer clearly pronounced speech, but also a higher speaking rate (see Rosenberg, Hirschberg 2021). High-pitched and slow male speech was perceived as unattractive (Quené et al. 2021).

Pitch variation in advertisements helps draw the listeners' attention. Although advertisements often use an over-emphatic, consistently high pitch to grab attention, a pattern of high followed by low pitch has been found to be better. A high initial pitch jolts the listener and prepares them to receive information (Rodero et al. 2017). Results by Weiss et al. (2021b) confirmed the same from the standpoint of voice likability: variability of fundamental frequency (pitch) turned out to be a dominating correlate of likable voices in male and female speakers. Listeners also

tend to find more rhythmic speech to be more likable, as Bosker (2021) has shown based on research on fluctuations in amplitude.

Although suitability and likability evaluations are subjective, there is a wide intra-cultural consensus on voice assessments (e.g., Baus et al. 2019, Pajupuu et al. 2019, Weiss et al. 2021b). Yet even after the studies in Weiss et al. (2021a), there is still room to expand the knowledge of which acoustic features are characteristic of an attractive voice. The respective extant research results are difficult to compare, as attractivity has been studied for different aims and based on varying speech material, the raters have been of different age groups, studies have been carried out in different cultures, the focus has been on different acoustic features, and so forth. Voice likability may not be apparent in just one, or a few acoustic features, but is likely a combination of several acoustic features (e.g., Babel et al. 2014, Eyben et al. 2013b, Pajupuu et al. 2019).

Recent research has shown that voice likability is not a long-term personal trait, but rather is tied to speaking style. For example, a study by Altrov et al. (2018) showed that listeners prefer voices reading written text to voices lecturing large audiences. The connections between voice likability and speaking style was also evidenced by Pajupuu et al. (2019), in which different ratings of likability were given to voices reciting poetry and being interviewed. In the context of radio advertising, Rodero and Potter (2021) have shown that most consumers do not like the performance style of radio advertisements – an exaggerated way of speaking with a strong emphasis. This style is caused by the tendency of spokespersons to overemphasise too many words. Acoustically, this is perceived as a constant hammering, which sounds unnatural and is challenging to listen to long term. As listeners have learned to associate this style automatically with advertising, and as it is annoying and unpleasant, they are likely to tune it out. Rodero and Potter (2021) concluded that a moderate style, where only key words are emphasised, would be beneficial: this would create acoustic contrast to attract attention, and the advert would then sound unaffected and more natural. A study by Pajupuu et al. (2023) on Estonian-language advertisements performed by synthesised voices in various styles has shown that listeners prefer a more neutral style over an emotional performance, one with a lower and quieter sonorous voice without rapid changes in loudness.

In this study, our goal is to widen knowledge on which performances in radio advertisements attract the listener and which acoustic features characterise those performances, focusing especially on the preferences of Estonian listeners. We were also interested in the influence posed by the choice of performer, their gender and age on the listeners' preferences. The study was conducted in Estonia with Estonian-language advertisements. For the acoustic analysis, we used eGeMAPS, a set of 88 acoustic parameters for various areas of automatic voice analysis, such as paralinguistic or clinical speech analysis (Eyben et al. 2016).

We addressed the following research questions:

1. Do listeners have a preference for an advertisement performance style and performer's voice?
2. Which acoustic features differentiate the advertisement performances liked by the listeners from unlikable ones?

2. Method

2.1. Material

This study was based on the use of voice samples of celebrities (well-known individuals who are recognised by voice, most of whom are actors) reading the same Estonian commercial pretend-advertisement in two styles – calm and energetic – which were sourced from the database of the audio-visual post-production studio Orbital Vox Studios (wav 44.1 kHz, 16 bit, stereo, average length of advertisement 20 sec). The readers, henceforth termed spokespersons (30 females, aged 17–65, M = 34.5 years, SD = 11.7, and 30 males, aged 20–54, M = 34.8 years, SD = 7.8) were only given broad instructions to present the advertisements in a calm or in an energetic manner, leaving further interpretation to their choice. The text of the advertisement did not hint at any concrete product, service or brand:

> *Kõigepealt sule silmad, lõdvestu ja tunne end täiesti rahulikult. Mõtle selle peale, mis on sulle kõige-kõige kallim ja mine osta see lihtsalt ära. Kallid asjad nüüd odavalt.*
> 'At first, close your eyes, relax, and feel perfectly at ease. Think about the thing which is most precious to you and then just go and buy it! Precious things are now cheap.'

2.2. Listening test

For the web-based listening test, advertisements performed in both energetic and calm styles by 30 female and 30 male voices were listed in a random sequence. A total of 120 performances had to be evaluated. The listeners had to evaluate the likability of the performance on a 7-point Likert scale, where 1 = not likable at all … 7 = very likable. The listeners were given the instruction: *Advertisements are often heard on the radio and in stores. They cannot be abolished but can be made more pleasant to listen to. Please help us in this endeavour! Find some headphones and listen to the following advertisements. Rate how you like the performance. You do not have to listen to all of the advertisements at once, you can save and return later. You can also change previous ratings.*

Two groups of Estonian listeners participated as raters: 18 women (aged 35–64, M = 46.4 years, SD = 8.4) and 18 men (aged 34–65, M= 45.7 years, SD = 6.9). Following the execution of the listening test, all scores for each rater were normalised:

$$y = (x - X) / s$$

where x is the score, X is the mean of scores and s is the standard deviation of the rater scores.

The spokespersons' performances were sorted based on the normalised scores. Performances with scores above the mean (normalised to zero) were classified as likable, those below the mean as unlikable. To find out the degree of agreement among the raters (*inter-rater reliability*), the intra-class correlation coefficient (ICC3k) for three groups was calculated using the 'psych' package in R (Revelle

2021): all raters together, all male raters together and all female raters together (see Koo, Li 2016).

A Welch Two Sample *t*-test was used to determine whether the spokesperson's gender and advertisement performance style affected likability ratings (R Core Team 2021). Pearson's correlation coefficient was used to measure the possible relationship between the spokesperson's age and the likability scores for their performances.

2.3. Acoustic analysis

The acoustic analysis determined the features differentiating performances rated as likable and unlikable by the listeners. For acoustic analysis the open-source toolkit openSMILE was used (Eyben et al. 2010, 2013a). The parameters of the extended Geneva Minimalistic Acoustic Parameter Set (eGeMAPS) were calculated for each advertisement. These 88 parameters include statistical properties (arithmetic mean, coefficient of variation, percentiles, etc.), calculated for the time-varying low-level acoustic features, including: frequency-related, energy-/amplitude-related, spectral, and temporal features (Eyben et al. 2016). Frequency-related features describe the fundamental frequency (F0), which is perceptible as the pitch of the voice, and vocal tract resonance frequencies (formants). Energy-/amplitude-related features represent the intensity of speech signal production, called the loudness. Loudness can be perceived from quiet to comfortable to loud. Perceptible loudness can be affected by pitch and spectral features. Spectral features reflect the timbre of the voice, and with shimmer, jitter, and harmonics-to-noise ratio, can represent breathiness, roughness, tenseness and some voice and health disorders. Temporal features reflect the rate of speech (i.e., the speed of someone's speech), via the duration of speech segments (see also Hurme 1995, Laukka et al. 2016, Nordström 2019).

To find acoustic features that distinguish between likable and unlikable advertising performances the Kruskal–Wallis test was used, and the statistically significant parameters were ordered by the test statistic (R Core Team 2020). This was done because not all parameters are normally distributed.

3. Results

3.1. Listening test results

The intra-class correlation coefficient (ICC3k) was calculated for the three rater groups – female listeners, male listeners and all listeners combined. A good to excellent reliability was found within all groups: The average measure ICC3k for female listeners was 0.94 with 95% confidence interval from 0.92 to 0.95 $F_{(119, 2023)} = 16.2$, $p < 0.0001$; The average measure ICC3k for male listeners was 0.85 with 95% confidence interval from 0.81 to 0.89 $F_{(119, 2023)} = 6.9$, $p < 0.001$; The average measure ICC3k for all listeners was 0.94 with 95% confidence interval from 0.93 to 0.96 $F_{(119, 4165)} = 17.9$, $p < 0.001$. Due to the high degree of agreement among the listeners, there was no reason to handle female and male listeners as separate groups.

When not taking advertisement performance style into account, raters scored female spokespersons slightly higher than male spokespersons (M_{female} = 0.04 *vs.* M_{male} = −0.04, t(4307) = 2.80, p = 0.005), see Figure 1.

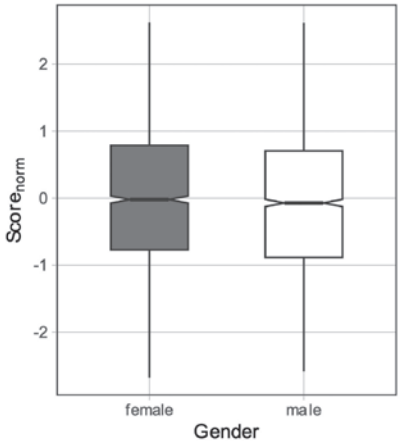

Figure 1. Rater scores for female and male spokespersons

The listeners overwhelmingly preferred the calm advertisement style (M_{calm} = 0.40 *vs.* $M_{energetic}$ = −0.40, t(4312) = 29.00, p < 0.001), see Figure 2.

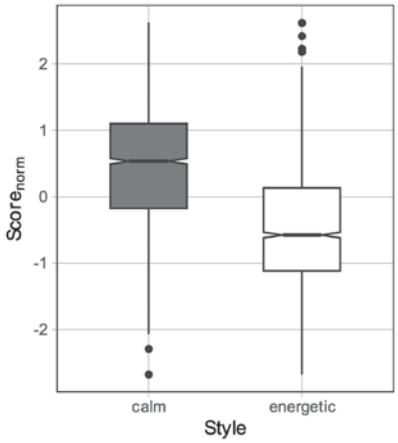

Figure 2. Rater scores for advertisement performance styles

Although there was no significant difference in scores given to female and male spokespersons presenting in the calm style ($M_{calm\ female}$ = 0.40 *vs.* $M_{calm\ male}$ = 0.41, t(2153)= −0.20, p = 0.843), for the energetic style, listeners rated male performances especially poorly ($M_{energetic\ female}$ = −0.31 *vs.* $M_{energetic\ male}$ = −0.49, t(2155) = 4.56, p < 0.001), see Figure 3.

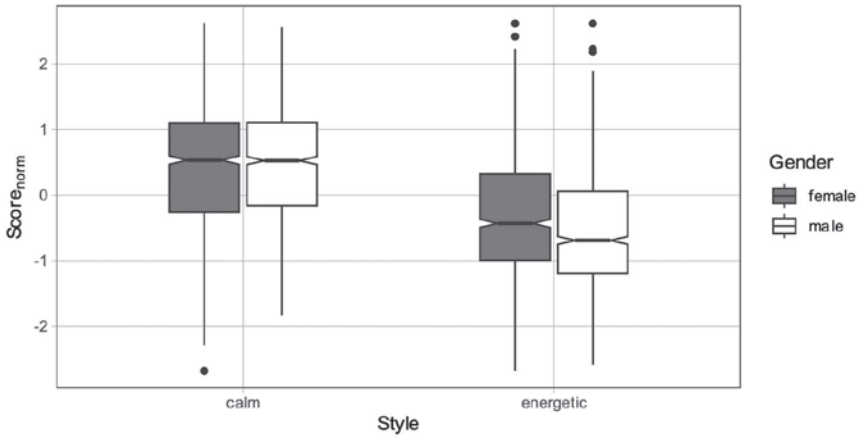

Figure 3. Rater scores for advertisement performance styles by spokesperson gender

In general, out of 120 energetic and calm performances, the listeners considered 66 likable, 55 of which were in the calm style. The likable advertisements were performed by 27 female and 28 male spokespersons. For eight female and three male spokespersons the listeners liked their performances in both styles. A total of 54 performances were classified as unlikable, of which 49 were in the energetic style. For three female and two male spokespersons, the listeners neither liked the energetic nor the calm advertisement styles, which suggests their voices may be unsuitable for performing advertisements in these two styles. The results show that the listeners' preference is primarily determined by the performance style, not choice of performer (see Figure 4).

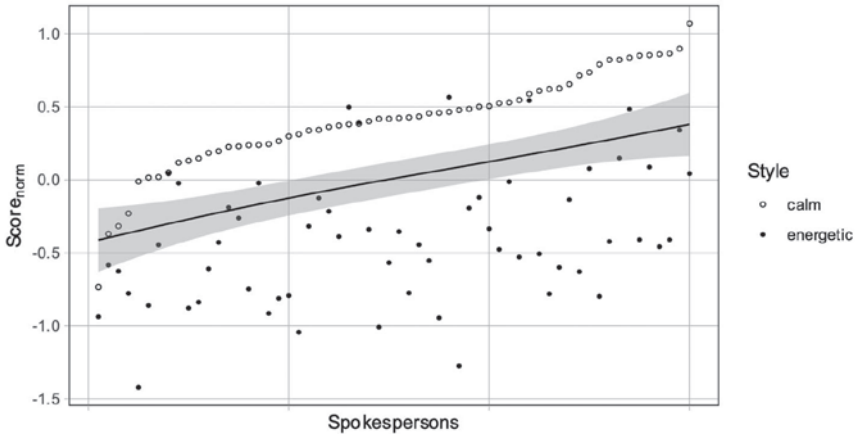

Figure 4. Average scores for style by spokesperson, sorted by scores of the calm style

The age of the spokespersons did not affect the likability of the performance ($r(4313) = 0.01$, $p = 0.472$), see Figure 5.

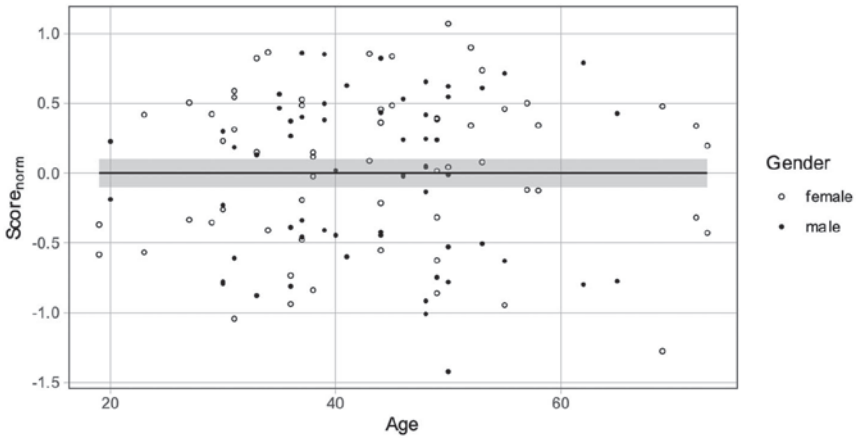

Figure 5. Spokesperson age and scores given to performances

3.2. The results of the acoustic analysis

The likable and unlikable advertisement performances were acoustically very different. Out of the 88 eGeMAPS parameters, 49 significantly differentiated the performances for female spokespersons, of which 11 were frequency related, 10 energy/amplitude related, 27 were spectral parameters and one was a temporal parameter. For male spokespersons, 70 parameters significantly differentiated the performances, including 16 frequency-related parameters, 14 energy/amplitude related parameters, 34 spectral parameters and 6 temporal parameters. The acoustic eGeMAPS parameters that differentiate the performances are presented with descriptions in the Supplementary material.[1]

As can be seen on Figure 6 and Table S1 in the Supplementary material (Pajupuu et al. 2024), the parameters that offer a more evident interpretation indicate that likable advertisement performances are characterised by

- lower pitch (lower f0);
- faster articulation rate (shorter voiced segment length);
- quieter voice (lower loudness);
- no abrupt changes in loudness (smaller rising and falling slopes of loudness);
- breathier voice (more shimmer, lower HNR); and
- more neutral speaking style (lower spectral flux, lower f0, lower HNR, higher Hammarberg index, see Liu, Xu 2014, Pralus et al. 2019).

As the same spokespersons presented advertisements in both styles, calm and energetic, and listeners mostly preferred advertisements in the calm style, acoustic analysis indicates that the style of performance affects the spokesperson's voice, making it likable in one case and unlikable in the other (see Figure 4).

[1] The Supplementary material, including the datasets generated and analysed during the current study can be found online at Figshare (Pajupuu et al. 2024). The audio files were provided by Orbital Vox Studios and were used under license for the current study, and so are not publicly available.

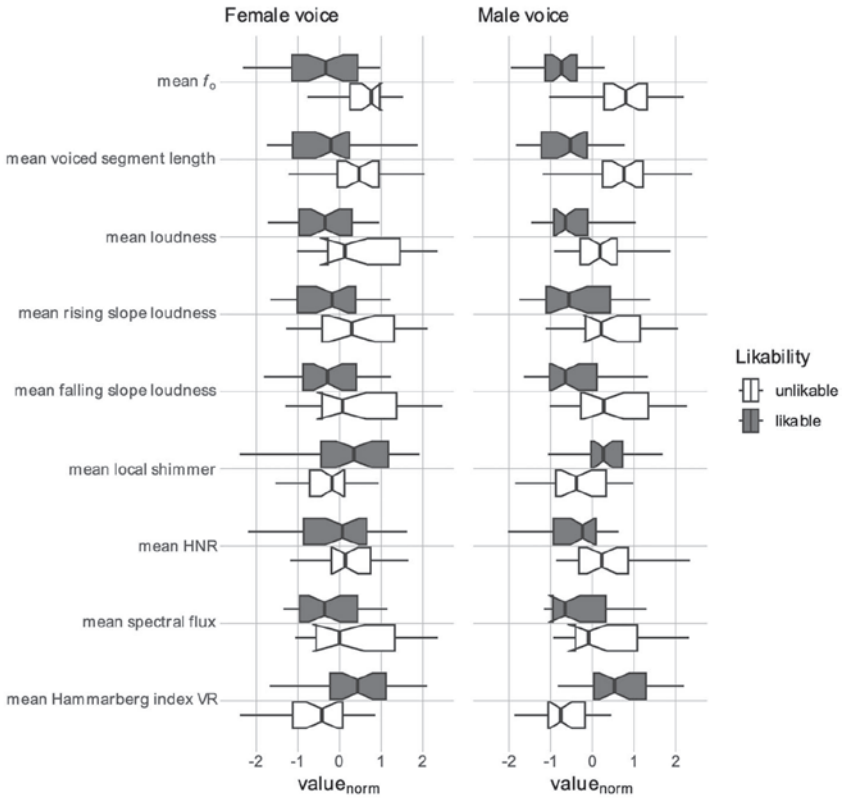

Figure 6. The statistically significant parameters that offer a more evident interpretation of the differences between advertisement performances

4. Discussion

The goal of this study was to determine which style of radio advertisement performance listeners consider likable and which acoustic feature sets differentiate the likable from the unlikable. This study used a gender neutral pretend-advertisement, which was performed twice by the same spokespersons (30 female, 30 male), in both a calm and an energetic style. The listeners had to rate the likability of the advertisement performances. We found that the listeners' likability ratings were consistent and not dependent on the listeners' gender (see chapter 3.1). Likability was primarily associated with performance style rather than spokesperson (see Figure 4). The listeners overwhelmingly preferred advertisements in the calm style (see Figure 2). The likable and unlikable performances also differed significantly in their acoustic parameters (see Figure 6 and Table S1 in the Supplementary material, Pajupuu et al. 2024).

As the aim of radio advertisements is to draw the listener's attention and create a positive attitude towards a product, service or brand, previous research has focused mostly on the persuasiveness, trustworthiness and memorability of radio advertisements – that is, their effectiveness (e.g., Allan 2007, Benavides, Van Weezel

2013, Martín-Santana et al. 2017, Wiener, Chartrand 2014). Although there has been concern that the voices for radio advertisement spokespersons are chosen mostly by intuition (see Rodero and Larrea 2021), there have been some studies that have centred on whether radio advertisement listeners prefer celebrities, male or female voices and high or low voice pitches (e.g., Dubey et al. 2018, Grigaliūnaitė, Pilelienė 2015, Rodero et al. 2013). Our study revealed that voice and performance style are linked: the same voice can be either likable or unlikable depending on the style. It is therefore particularly important to ascertain the advertisement performance style that listeners prefer. Considering voice likability separately from speaking style in the choice of a spokesperson can lead to undesired results. Our conclusions support the studies which have found connections between speaking style and voice likability (e.g., Altrov et al. 2018, Pajupuu et al. 2019, Rodero, Potter 2021).

Estonian listeners predominantly preferred advertisements presented in a calm style and disliked those that were in an energetic style, regardless of whether the spokesperson was a well-known actor, male or female, young or old. Male spokespersons presenting in an energetic style were found to be especially disagreeable (see Figure 3). Although broadcasters often choose men to be spokespersons, as it is thought that their lower voice gives credibility to the advertisement (Rodero, Larrea 2021), the listeners in our study slightly preferred female voices (see Figure 1). Thus, our results concur with those that have shown that, for gender-neutral products, there is no advantage in using a male voice over a female voice (see Quené-Santana et al. 2015, 2017, Rodero et al. 2013, Whipple, McManamon 2002). As in earlier studies (e.g., Klofstad et al. 2012, Martín-Santana et al. 2015), our results indicate that lower voices go hand in hand with an appealing performance style, for both female and male performers (see Figure 6).

As far as we know, the influence of the spokesperson's age on the likability of their advertisement performance has not previously been studied. Our findings show that the likability scores of Estonian listeners were not affected by the performer's age (see Figure 5). However, the pretend-advertisement in this study was not associated with any concrete product, service or brand. Real world situations may necessitate the choice of a male or female spokesperson of a specific age group, either a celebrity or typical consumer (non-celebrity).

The likable advertisement performances were distinguished from the unlikable by 49 acoustic parameters for female spokespersons and 70 for male spokespersons, out of 88 calculated eGeMAPS parameters (see Table S1 in the Supplementary material, Pajupuu et al. 2024). Among these, in addition to a lower pitch, likable performances were characterised by a faster articulation rate (see Figure 6). Previous studies have shown that listeners prefer a normal speech tempo; for fast speech there is a preference for a lower voice, and for a high-pitched male voice slow speech is unattractive (e.g., Chattopadhyay et al. 2003, Rodero 2020, Rosenberg, Hirschberg 2021, Quené et al. 2021). Looking at speech rate along with pitch, our results point to the same tendency: listeners prefer a lower voice and faster speech.

The performances favoured by Estonians are also characterised by a quieter voice with no sharp changes in loudness and a neutral rather than an emotional performance. This is in line with a study by Rodero and Potter (2021), who showed that listeners do not like radio advertisements that are presented in an unnaturally overemphatic style, as it causes problems in perception, attention and memory.

Furthermore, a study on Estonian synthesised speech supports the findings of the current study: listeners preferred a quieter voice without rapid changes in loudness, speaking in a neutral style (Pajupuu et al. 2023).

Likable and unlikable performances were differentiated by many spectral parameters that are associated with voice timbre (see Table S1 in the Supplementary material, Pajupuu et al. 2024). Some of them point to a breathy voice being perceived as likable (see Figure 6). How listeners would describe a voice timbre that is associated with a likable performance and whether there is an equivalent among acoustic parameters requires further study.

Lastly, the aim of radio advertisements is to captivate the listener, grab their attention and influence their behaviour in a desired direction. Although the preference of Estonian listeners was for advertisements in a calm style, characterised by a lower voice with faster, quieter and more neutral speech and a breathy voice, it is not known whether advertisements presented in this way might be effective. We can, however, assume that if the advertisement is pleasant in its presentation, the listener will be less inclined to change the channel or shut the radio off, and would be more willing to hear the advertisement repeatedly, which can secure its memorability.

Thus the results of our study – a knowledge of which style of advertisement performance listeners prefer and which acoustic features separate likable performances from unlikable ones – add to our knowledge on spokespersons and the use of their voices. As far as we know, there have been few studies where the acoustics of advertisement performances have been described with eGeMAPS parameters. As the use of eGeMAPS in the acoustic analysis of advertisement performances has turned out to be effective, it could become the standard for analysing speaking styles, making the results of various studies much more comparable (see also Eyben et al. 2016). Our study also had some limitations, namely, the chosen audio clips did not advertise a concrete product, so the spokespersons were not able to make choices informed by the product in their performance style. Based on our results, we do not know which performance styles and voices are preferred by listeners of different age groups and cultures. It follows that future research could be carried out using real advertisements, involving raters from different age groups and cultures.

References

Allan, David 2007. Comparative effectiveness of 30- versus 60-second radio commercials on recall and rate. – Journal of Radio Studies, 14 (2), 165–177. https://doi.org/10.1080/10955040701583262

Altrov, Rene; Pajupuu, Hille; Pajupuu, Jaan 2018. Phonogenre affecting voice likability. – Proceedings. 9th International Conference on Speech Prosody 2018, 177–181. https://doi.org/10.21437/SpeechProsody.2018-36

Babel, Molly; McGuire, Grant; King, Joseph 2014. Towards a more nuanced view of vocal attractiveness. – PLoS ONE, 9 (2), e88616. https://doi.org/10.1371/journal.pone.0088616

Baus, Cristina; McAleer, Phil; Marcoux, Katherine; Belin, Pascal; Costa, Albert 2019. Forming social impressions from voices in native and foreign languages. – Scientific Reports, 9 (1), a414. https://doi.org/10.1038/s41598-018-36518-6

Benavides, Cristóbal; Van Weezel, Aldo 2013. Engaging readers: A study of magazine advertising effectiveness in the Chilean media market. – Communication & Society / Comunicación y Sociedad, 26 (2), 131–146. https://doi.org/10.15581/003.26.36125

Bosker, Hans Rutger 2021. The contribution of amplitude modulations in speech to perceived charisma. – Benjamin Weiss, Jürgen Trouvain, Melissa Barkat-Defradas, John J. Ohala (Eds.), Voice Attractiveness: Studies on Sexy, Likable, and Charismatic Speakers. Singapore: Springer, 165–182. https://doi.org/10.1007/978-981-15-6627-1_10

Chattopadhyay, Amitava; Dahl, Darren W.; Ritchie Robin J. B.; Shahin, Kimary N. 2003. Hearing voices: The impact of announcer speech characteristics on consumer response to broadcast advertising. – Journal of Consumer Psychology, 13 (3), 198–204. https://doi.org/10.1207/S15327663JCP1303_02

Dahl, Darren W. 2010. Understanding the role of spokesperson voice in broadcast advertising. – Aradhna Krishna (Ed.), Sensory Marketing: Research on the Sensuality of Products. New York–London: Routledge/Taylor & Francis Group, 169–182.

Dubey, Megha; Farrell, Janise; Ang, Lawrence 2018. How accent and pitch affect persuasiveness in radio advertising. – Verolien Cauberghe, Liselot Hudders, Martin Eisend (Eds.), Advances in Advertising Research IX: Power to Consumers. Wiesbaden: Springer Gabler, 117–130. https://doi.org/10.1007/978-3-658-22681-7_9

Ebrahimi, Samaneh; Vahabi, Hossein; Prockup, Matthew; Nieto, Oriol 2018. Predicting audio advertisement quality. – Proceedings of the 11th ACM International Conference on Web Search and Data Mining (WSDM'18). New York: Association for Computing Machinery, 153–161. https://doi.org/10.1145/3159652.3159701

EBU 2022 = The European Broadcasting Union's Media Intelligence Service (MIS) 2022. Audience Trends: Radio 2022. Public version. https://radiovisie.eu/wp-content/uploads/2022/07/EBU-MIS-Radio_Audience_Trends_2022_Public.pdf (19.9.2023).

Erfgen, Carsten; Zenker, Sebastian; Sattler, Henrik 2015. The vampire effect: When do celebrity endorsers harm brand recall? – International Journal of Research in Marketing, 32 (2), 155–163. https://doi.org/10.1016/j.ijresmar.2014.12.002

Eyben, Florian; Scherer, Klaus; Schuller, Bjorn; Sundberg, Johan; Andre, Elisabeth; Busso, Carlos; Devillers, Laurence; Epps, Julien; Laukka, Petri; Narayanan, Shrikanth; Truong, Khiet 2016. The Geneva minimalistic acoustic parameter set (GeMAPS) for voice research and affective computing. – IEEE Transactions on Affective Computing, 7 (2), 190–202. https://doi.org/10.1109/TAFFC.2015.2457417

Eyben, Florian; Weninger, Felix; Groß, Florian; Schuller, Björn 2013a. Recent developments in openSMILE, the Munich open-source multimedia feature extractor. – Proceedings of the 21st ACM International Conference on Multimedia, MM 2013. Barcelona: Association for Computing Machinery, 835–838. https://doi.org/10.1145/2502081.2502224

Eyben, Florian; Weninger, Felix; Marchi, Erik; Schuller, Björn 2013b. Likability of human voices: A feature analysis and a neural network regression approach to automatic likability estimation. – Proceedings of the 14th International Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS) 2013. Paris: IEEE, 1–4. https://doi.org/10.1109/WIAMIS.2013.6616159

Eyben, Florian; Wöllmer, Martin; Schuller, Björn 2010. openSMILE: The Munich versatile and fast open-source audio feature extractor. – Proceedings of the 18th ACM International Conference on Multimedia, MM 2010. Florence: Association for Computing Machinery, 1459–1462. https://doi.org/10.1145/1873951.1874246

Fam, Kim-Shyan; Waller David S.; de Run, Ernest Cyril; He, Jian 2013. Advertising dislikeability in Asia: Is there a relationship with purchase intention and frequency? – Asia Pacific Journal of Marketing and Logistics, 25 (1), 144–161. https://doi.org/10.1108/13555851311290984

Grigaliūnaitė, Viktorija; Pilelienė, Lina 2015. Determination of the impact of spokesperson on advertising effectiveness. – International Journal of Management, Accounting and Economics, 2 (8), 810–822.

Hurme, Pertti 1995. Acoustic Studies of Voice Variation. Jyväskylä Studies in Communication, 7. Jyväskylä: University of Jyväskylä.

Kantar Emor 2020. Kas eriolukord on avaldanud mõju raadiokuulamisele? [Has the emergency situation had an influence on radio listening?]. https://www.kantaremor.ee/blogi/kas-eriolukord-on-avaldanud-moju-raadiokuulamisele/ (17.9.2023).

Klofstad, Casey A.; Anderson, Rindy C.; Peters, Susan 2012. Sounds like a winner: Voice pitch influences perception of leadership capacity in both men and women. – Proceedings of the Royal Society B, Biological Sciences, 279 (1738), 2698–2704. https://doi.org/10.1098/rspb.2012.0311

Koo, Terry K.; Li, Mae Y. 2016. A guideline of selecting and reporting intraclass correlation coefficient for reliability research. – Journal of Chiropractic Medicine, 15 (2), 155–163. https://doi.org/10.1016/j.jcm.2016.02.012

Kuvita, Tetyana; Karlíček, Miroslav 2014. The risk of vampire effect in advertisements using celebrity endorsement. – Central European Business Review, 3 (3), 16–22. https://doi.org/10.18267/j.cebr.89

Laukka, Petri; Elfenbein, Hillary Anger; Thingujam, Nutankumar S.; Rockstuhl, Thomas; Iraki, Frederick K.; Chui, Wanda; Jean Althoff, Jean 2016. The expression and recognition of emotions in the voice across five nations: A lens model analysis based on acoustic features. – Journal of Personality and Social Psychology, 111 (5), 686–705. https://doi.org/10.1037/pspi0000066

Liu, Xiaoluan; Xu, Yi 2014. Body size projection by voice quality in emotional speech: Evidence from Mandarin Chinese. – Nick Campbell, Dafydd Gibbon, Daniel Hirst (Eds.), Social and Linguistic Speech Prosody: Proceedings of the 7th International Conference on Speech Prosody, 20–23 May 2014, Dublin, Ireland. Dublin: International Speech Communication Association, 974–977. https://doi.org/10.21437/SpeechProsody.2014-184

Majidi, Michele 2023. Radio advertising spending in Western Europe 2000–2024. – Statista. https://www.statista.com/statistics/799781/radio-ad-spend-in-western-europe (17.9.2023).

Martín-Santana, Josefa D.; Muela-Molina, Clara; Reinares-Lara, Eva; Miriam Rodríguez-Guerra, Miriam 2015. Effectiveness of radio spokesperson's gender, vocal pitch and accent and the use of music in radio advertising. – BRQ: Business Research Quarterly, 18 (3), 143–160. https://doi.org/10.1016/j.brq.2014.06.001

Martín-Santana, Josefa D.; Reinares-Lara, Eva; Reinares-Lara, Pedro 2017. Influence of radio spokesperson gender and vocal pitch on advertising effectiveness: The role of listener gender. – Spanish Journal of Marketing: ESIC, 21 (1), 63–71. https://doi.org/10.1016/j.sjme.2017.02.001

Michelon, Aaron; Bellman, Steven; Faulkner, Margaret; Cohen, Justin; Bruwer, Johan 2020. A new benchmark for mechanical avoidance of radio advertising. – Journal of Advertising Research, 60 (4), 407–416. https://doi.org/10.2501/jar-2020-007

Nordström, Henrik 2019. Emotional Communication in the Human Voice. PhD thesis. Stockholm University.

Pajupuu, Hille; Altrov, Rene; Pajupuu, Jaan 2019. The effects of culture on voice likability. – Trames: Journal of the Humanities and Social Sciences, 23 (2), 239–257. https://doi.org/10.3176/tr.2019.2.08

Pajupuu, Hille; Pajupuu, Jaan; Altrov, Rene; Kiissel, Indrek 2023. Robot reads ads: Likability of calm and energetic audio advertising styles transferred to synthesized voice. – Frontiers in Communication, 8, 1089577. https://doi.org/10.3389/fcomm.2023.1089577

Pajupuu, Hille; Altrov, Rene; Pajupuu, Jaan 2024. Preference of voice and performance style: Data of the listening test and acoustic analysis. Figshare. Dataset. https://doi.org/10.6084/m9.figshare.25028036.v1

Papathanassopoulos, Stylianos; Giannouli, Iliana; Archontaki, Ioanna; Karadimitriou, Achilleas 2023. The media in Europe 1990–2020. – Stylianos Papathanassopoulos, Andrea Micon (Eds.), The Media Systems in Europe: Continuities and Discontinuities. Springer

Studies in Media and Political Communication. Cham: Springer, 35–67. https://doi.org/10.1007/978-3-031-32216-7_3
Pralus, Agathe; Fornoni, Lesly; Bouet, Romain; Gomot, Marie; Bhatara, Anjali; Tillmann, Barbara; Caclin, Anne 2019. Emotional prosody in congenital amusia: Impaired and spared processes. – Neuropsychologia, 134, 107234. https://doi.org/10.1016/j.neuropsychologia.2019.107234
Quené Hugo; Boomsma, Geke; van Erning, Romée 2021. Attractiveness of male speakers: Effects of pitch and tempo. – Benjamin Weiss, Jürgen Trouvain, Melissa Barkat-Defradas, John J. Ohala (Eds.), Voice Attractiveness. Studies on Sexy, Likable, and Charismatic Speakers. Singapore: Springer, 153–164. https://doi.org/10.1007/978-981-15-6627-1_9
R Core Team 2020. R: A Language and Environment for Statistical Computing. Vienna: R Foundation for Statistical Computing. https://www.R-project.org/ (19.9.2023).
Reinares-Lara, Eva; Martín-Santana, Josefa D.; Muela-Molina, Clara 2016. The effects of accent, differentiation, and stigmatization on spokesperson credibility in radio advertising. – Journal of Global Marketing, 29 (1), 15–28. https://doi.org/10.1080/08911762.2015.1119919
Revelle, William 2021. psych: Procedures for Psychological, Psychometric, and Personality Research. Northwestern University, Evanston, Illinois. R package version 2.1.6. https://CRAN.R-project.org/package=psych (19.9.2023).
Rodero, Emma 2017. Effectiveness, attention, and recall of human and artificial voices in an advertising story: Prosody influence and functions of voices. – Computers in Human Behavior, 77, 336–346. https://doi.org/10.1016/j.chb.2017.08.044
Rodero, Emma 2020. Do your ads talk too fast to your audio audience? – Journal of Advertising Research, 60 (3), 337–349. https://doi.org/10.2501/JAR-2019-038
Rodero, Emma; Larrea, Olatz 2021. Audio design in branding and advertising. – Lluís Mas-Manchón (Ed.), Innovation in Advertising and Branding Communication. Routledge. https://doi.org/10.4324/9781003009276
Rodero, Emma; Larrea, Olatz; Vázquez, Marina 2013. Male and female voices in commercials: Analysis of effectiveness, adequacy for the product, attention and recall. – Sex Roles, 68 (5–6), 349–362. https://doi.org/10.1007/s11199-012-0247-y
Rodero, Emma; Potter, Robert F. 2021. Do not sound like an announcer: The emphasis strategy in commercials. – Psychology & Marketing, 38 (9), 1417–1425. https://doi.org/10.1002/mar.21525
Rodero, Emma; Potter, Robert F.; Prieto, Pilar 2017. Pitch range variations improve cognitive processing of audio messages. – Human Communication Research, 43 (3), 397–413. https://doi.org/10.1111/hcre.12109
Rosenberg, Andrew; Hirschberg, Julia 2021. Prosodic aspects of the attractive voice. – Benjamin Weiss, Jürgen Trouvain, Melissa Barkat-Defradas, John J. Ohala (Eds.). Voice Attractiveness: Studies on Sexy, Likable, and Charismatic Speakers. Singapore: Springer, 17–40. https://doi.org/10.1007/978-981-15-6627-1_2
Searles, Kathleen; Fowler, Erika Franklin; Ridout, Travis N.; Strach, Patricia; Zuber, Katherine 2020. The effects of men's and women's voices in political advertising. – Journal of Political Marketing, 19 (3), 301–329. https://doi.org/10.1080/15377857.2017.1330723
Tsantani, Maria S.; Belin, Pascal; Paterson, Helena M.; McAleer, Phil 2016. Low vocal pitch preference drives first impressions irrespective of context in male voices but not in female voices. – Perception, 45 (8), 946–963. https://doi.org/10.1177/0301006616643675
Vinney, Cynthia; Vinney, Lisa A. 2017. That sounds familiar: The relationship between listeners' recognition of celebrity voices, perceptions of vocal pleasantness, and engagement with media. – Journal of Radio & Audio Media, 24 (2), 320–338. https://doi.org/10.1080/19376529.2017.1346659

Weiss, Benjamin; Burkhardt, Felix 2012. Is 'not bad' good enough? Aspects of unknown voices' likability. – Proceedings of Interspeech 2012, 510–513. https://doi.org/10.21437/Interspeech.2012-97

Weiss, Benjamin; Trouvain, Jürgen; Barkat-Defradas, Melissa; Ohala, John J. (Eds.) 2021a. Voice Attractiveness. Studies on Sexy, Likable, and Charismatic Speakers. Singapore: Springer. https://doi.org/10.1007/978-981-15-6627-1

Weiss, Benjamin; Trouvain, Jürgen; Burkhardt, Felix 2021b. Acoustic correlates of likable speakers in the NSC database. – Benjamin Weiss, Jürgen Trouvain, Melissa Barkat-Defradas, John J. Ohala (Eds.), Voice Attractiveness: Studies on Sexy, Likable, and Charismatic Speakers. Singapore: Springer, 245–262. https://doi.org/10.1007/978-981-15-6627-1_13

Westermann, Carl-Frank 2008. Sound branding and corporate voice-strategic brand management using sound. – Thomas Hempel (Ed.), Usability of Speech Dialog Systems: Listening to the Target Audience. Berlin–Heidelberg: Springer, 147–155. https://doi.org/10.1007/978-3-540-78343-5_7

Whipple, Thomas W.; McManamon, Mary K. 2002. Implications of using male and female voices in commercials: An exploratory study. – Journal of Advertising, 31 (2), 79–91. https://doi.org/10.1080/00913367.2002.10673668

Wiener, Hillary J. D.; Chartrand, Tanya L. 2014. The effect of voice quality on ad efficacy. – Psychology and Marketing, 31 (7), 509–517. https://doi.org/10.1002/mar.20712

HÄÄLE JA ESITUSSTIILI EELISTUS RAADIOREKLAAMIS

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Uurimuse eesmärk oli teada saada, millist raadioreklaamide esitust peavad kuulajad meeldivaks ja millised akustilised tunnused eristavad meeldivat mittemeeldivast. Ühed ja samad reklaamiesitajad (30 naist ja 30 meest) esitasid sooneutraalset reklaami rahulikus ja energilises stiilis. Kuulajad hindasid reklaami esituste meeldivust. Hindajateks olid 18 naist (vanus 35–64 aastat, M = 46,4 aastat, SD = 8,4) ja 18 meest (vanus 34–65, M = 45,7 aastat, SD = 6,9). Tulemused näitasid, et kuulajate meeldivushinnangud olid sarnased ega sõltunud kuulaja soost. Kuulajad eelistasid ülekaalukalt rahulikus stiilis esitatud reklaame, sõltumata esitajast, tema vanusest ja soost. Reklaamiesituste akustiliseks analüüsiks kasutati vabavaralist tööriista openSMILE. Igale reklaamiesitusele arvutati Geneva minimaalse akustiliste parameetrite laiendatud kogumi (eGeMAPS) 88 parameetrit. Neist enamik eristas meeldinud ja mittemeeldinud esitusi oluliselt. Meeldinud esitusi iseloomustas muuhulgas madalam põhitoon, suurem artikulatsiooni kiirus, vaiksem hääl ilma järskude valjuse muutusteta ja kahisev hääl. Samuti oli iseloomulik pigem neutraalne kui emotsionaalne esitus. Analüüsist järeldus, et oluline on leida vastavasse kultuuri sobiv reklaami esitusstiil. Kuna esitaja häälekõla on otseselt seotud esitusstiiliga, siis see võib kuulajale ühes stiilis meeldida, teises aga mitte.

Võtmesõnad: raadioreklaamid, kõnestiilid, hääle meeldivus, kõnetaju, akustilised tunnused, GeMAPS

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