

# The Role of Audience Gender in Giving Product Presentations

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Speakers have always used their vocal charisma to persuade an audience and attract followers. It is of vital importance to understand charisma in speech not only for applications in text-to-speech synthesis (e.g., in order to create persuasive or charming robots) [1], but also for helping speakers to improve their own charismatic presentation skills [2].

Starting with the work of Touati in the early 1990s [3], an increasing number of phonetic studies has successively identified those prosodic and segmental parameters that are positively correlated with perceived speaker charisma [4]. For example, being more charismatic means to speak faster and clearer, in shorter prosodic phrases, at higher  $f_0$  and intensity levels, and with a greater  $f_0$  and intensity variation. However, most research on charismatic speech dealt with politicians and industry leaders and was, partly for this reason, strongly focused on male speakers alone. It is only since recently that research has started to analyze female speakers and investigate a potential gender bias in producing and perceiving charismatic speech [5, 6].

Continuing this line of research and adding a cross-cultural perspective to it, the present study addresses the role of the audience in charismatic speech. However, we do not want to make the second step before the first by examining if male and female listeners arrive at different charisma ratings for the same set of speech stimuli. Rather, the first step is to analyze if and how the speech-production behavior of male and female speakers is affected when they are asked to give a speech in front of a same-gender or an opposite-gender audience. We address this question with those two acoustic-prosodic parameters whose effect on charisma is well researched [7] and that, moreover, probably differ most consistently and stereotypically between male and female speakers:  $f_0$  level (L- $f_0$ ) and voice quality (VQ).

The data of this study was taken from the World-of-Public-Speaking (WoPS) corpus. It consists of recordings of male and female speakers that together represent 12 different major countries and languages from around the world. All WoPS speakers are similar in terms of their age, educational background, and public-speaking experience; and they all were given the same set of elicitation tasks and recorded under the same conditions. The countries/languages that are included in the current study are: Mandarin Chinese, Ukrainian, Spanish, and Turkish. We analyzed 10 male and 10 female speakers per country/language, i.e. 80 speakers in total. The analyzed speech material was an award-winning product presentation, given by speakers with the intention to acquire startup investor capital for a new smart-phone app that tracks employees' work time (a pilot study identified this product/topic as the most gender-neutral one, e.g., compared to other typical startup products/topics that concern engineering, healthcare, or food). Speakers received the product presentation as a written text and had at least one day to familiarize themselves with the text prior to being recorded. The text was translated from English into the 4 analyzed languages by professional interpreters. In the recording session, speakers were asked to give the product presentation twice, once addressing an imagined male audience and once addressing an imagined female audience (of potential investors). Order was balanced across speakers. Measurements of L- $f_0$  and VQ were made with PRAAT. With reference to [7], VQ was measured as the slope of spectral-energy loss from 0-8 kHz, estimated in terms of the energy ratio between 1-5 kHz and 5-8 kHz.

Results of a MANOVA show that the two dependent variables, L- $f_0$  and VQ, were significantly affected by the three fixed factors Speaker Gender, Audience Gender and Language/Country. Finding a main effect of Speaker Gender on L- $f_0$  ( $F[1,76]=92.1$ ,  $p<0.001$ ) and VQ ( $F[1,76]=81.5$ ,  $p<0.001$ ) was not surprising given that both L- $f_0$  and VQ are well

known to differ between male and female speakers. In contrast, finding a main effect of Audience Gender (L-f<sub>0</sub>: F[1,76]=34.9, p<0.001; VQ: F[1,76]=50.7, p<0.001) was more surprising, in particular as it was only the speakers' imagination of a male or female audience that caused the change. The nature of the change was consistent across languages/countries, i.e. the prosody of the speakers became more similar to the audience gender that they had addressed in their product presentation. For example, speakers (both males and females) used a higher-pitched and breathier voice (i.e. a steeper spectral slope) when presenting for female listeners -- or a lower-pitched and more resonant voice (i.e. a shallower spectral slope) when presenting for male listeners.

Additionally, the magnitude of this audience-gender adaptation varied with the speakers' Language/Country, thus creating a significant interaction of this factor with Audience Gender (L-f<sub>0</sub>: F[3,76]=39.3, p<0.001; VQ: F[3,76]=64.8, p<0.001). What is most noteworthy about this interaction is that the speakers' audience-gender adaptation seems to be linked to the country's ranking in the Global Gender Gap Report of the UN and the World Economic Forum [8] (preliminary analyses with a larger set of languages/countries supported this idea). That is, the lower the gender-gap ranking and the greater the inequality between men and women in the four countries, the more did our analyzed speakers adjust their speech prosody to that of the audience gender. In the case of VQ, this correlation held without any exception. In the case of L-f<sub>0</sub>, it was more weakly pronounced. For example, while Spanish speakers (rank #8) showed overall no significant shift to a more male or female voice pitch, the shift occurred for some of our Ukrainian speakers (rank #59) and was found consistently and significantly for Chinese (rank #106) and Turkish (rank #130) speakers.

Our follow-up analyses will include more languages, more speakers per language, and a larger set of charisma-related prosodic parameters. Moreover, we are currently conducting two perception experiments in which we cross-check the acoustic findings with direct and indirect ratings of perceived speaker charisma. In any event, what we can conclude from our present data already is that audience gender and speaker's cultural/language background are both factors that need to be taken into account in future evaluations and trainings of charismatic speaking skills.

## References

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