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## ARTICLE

# Influence of radio spokesperson gender and vocal pitch on advertising effectiveness: The role of listener gender



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**Abstract** In radio advertising, there is a tendency to employ males in the belief that the male voice is more credible and effective. Because of this, advertising practice is encouraging gender discrimination in disregard of objective criteria. This paper analyzes the effects of spokesperson gender and vocal pitch and their interaction, as well as the effect of listener gender on effectiveness in relation to a radio spot for a non-gendered product (blood donation). We conducted a 2 (male–female voices)  $\times$  2 (low–high vocal pitches)  $\times$  2 (male–female listeners) experimental design via 4 radio programs in which we inserted a radio spot in a commercial block. A sample of 987 Spanish radio listeners was used. Our findings contrast with the existing practice in advertising of preferring male voices, highlighting the need for objective criteria in the selection of voices. In fact, the results shows that vocal pitch has a direct effect which is more significant than gender in terms of unaided recall. Additionally, the results of the interaction effect between spokesperson gender and vocal pitch reinforce the use of female voices, as low-pitched female voices are precisely the ones that generate more favorable attitudes toward the ad and the brand.

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**PALABRAS CLAVE**

Radio;  
Eficacia publicitaria;  
Tono de voz del  
portavoz;  
Género del portavoz;  
Género del oyente

## Influencia del género y el tono de voz del portavoz radiofónico en la eficacia publicitaria: papel del género del oyente

**Resumen** En la publicidad radiofónica, existe una tendencia a emplear varones, en la creencia de que la voz masculina es más creíble y eficaz. Debido a ello, la práctica publicitaria anima a la discriminación de género, haciendo caso omiso de los criterios objetivos. Este documento analiza los efectos del género y el tono de voz del portavoz y su interacción, así como el efecto del género del oyente en la efectividad, con relación a un anuncio radiofónico de un producto carente de género (la donación de sangre). Utilizamos un diseño experimental de 2 (voces varón-mujer) x 2 (tonos de voz bajos-altos) x 2 (oyentes varón-mujer) a través de 4 programas de radio en los que insertamos un anuncio radiofónico en un bloque comercial. Se utilizó una muestra de 987 oyentes radiofónicos españoles. Nuestros hallazgos contrastan con la práctica existente en publicidad, de preferir las voces masculinas, subrayando la necesidad de criterios objetivos en la selección de voces. De hecho, el resultado refleja que el tono de voz tiene un efecto directo, que es más significativo que el género en términos de recordación espontánea. Además, los resultados del efecto de interacción entre el género del portavoz y el tono de voz refuerzan la utilización de voces femeninas de tono bajo, ya que éstas son precisamente las que generan actitudes más favorables hacia el anuncio y la marca.

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## Introduction

The advertising industry and the scientific community are interested in analyzing the role of gender in the media, and this is due to the role advertising plays as a socializing agent (Piñeiro Otero, 2010). This interest has given rise to studies on the topic, although the majority focus on television and few of them have analyzed radio despite its high level of penetration. According to Radio Advertising Bureau (2016), radio allows to select any segment of population because reaching over 93% of people age 12 and older every week and 78% daily. Also radio generates a high levels of loyalty and engaging and these can be transferred to its advertising.

This study was conducted in Spain, where almost 60.4 percent of the population listens to the radio on a daily basis (AIMC-EGM, 2016). The audience is comprised mainly of men, but the difference when compared to the percentage that makes up the female audience would not seem sufficient to justify the predominance of male voices. However, in the Spanish context, several studies highlight the fact that radio advertising is clearly dominated by male voices (Perona & Barbeito, 2008).

These results give rise to the following question: is the predominance of male voices in Spanish advertising justified? Some studies argue that this predominance in radio advertising may be due to their lower vocal pitch as low-pitched voices are considered more serious, credible, safe and powerful than high-pitched voices, which are defined as sweet, familiar and cheerful (Perona & Barbeito, 2008). This link between low-pitched voices and the male gender leads to paradoxical situations such as using male voices in radio ads targeted at women – as the aim is to assign the message greater credibility – forgetting that listeners need to identify themselves with the protagonist of the message. The fact that voices are considered in terms of gender has favored the perpetuation of vocal stereotypes that could

justify this situation. That is why there is a need for studies which analyze the potential of different voices when it comes to transmitting a radio message since, as Keith (1992) underlines, the choice of spokesperson is one of the most important decisions in advertising. For this reason, the selection should follow phonogenic criteria. The most phonogenic voices are the ones within the lower ranges. They transmit greater trust, as they are associated with attributes such as safety and credibility. Thus, as Rodero (2001) shows, this leads us to establish the notion that positive connotations linked to low-pitched voices are valid for both genders, and that these qualities being exclusively attributed to male voices, as is currently the case, is not justified. This fallacy has also led to the situation where female voices are being associated with the more negative characteristics linked to higher vocal ranges. Along this line, Madaran and Catterall (2000) state that feminine traits include empathy, helpfulness, caring, and recognition of community interests. In contrast, masculine traits include an ability to be impersonal, self-interested, and efficient.

Therefore, given that vocal pitch is a defining characteristic that conveys personality and distinguishes it from others (Piñeiro Otero, 2010; Tigue, Borak, O'Connor, Schandl, & Feinberg, 2012), the question that arises when considering the common practice in radio is the following: is the underuse of female voices in Spanish advertising justified, regardless of their vocal pitch?

The study of the voice in radio advertising has focused mainly on content analysis, whereas hardly any studies have explored its influence on advertising effectiveness. In this line, Dahl (2010) considers that despite the apparently relevant role of voice in determining the effectiveness of an advertisement, little research has been done in this area. The effectiveness depends on several factors regarding its microstructure – among them phonoaesthetic function – as the effect of a message depends not only on the way it is

worded, but also on the way it is transmitted. A message can be more or less effective depending on the spokesperson phonoaesthetic, which has a considerable impact on how the message is processed by the audience and the influence it has on them (Yilmaz, Telci, Bodur, & Iscioglu, 2011). For this, some studies analyze the role of phonoaesthetic function on message effectiveness (Chattopadhyay, Dahl, Ritchie, & Shahin, 2003; Whipple & McManamon, 2002). This line of investigation and the framework of our study are based on models of response to advertising (Batra, Meyers, & Aaker, 1996). In these models, which attempt to explain the behavior of individuals exposed to advertising, there is a sequence of stages through which the individuals have to pass: learn, feel and do. This helps in understanding how consumer attitude is formed and how the purchase decision is made. The result of the meta-analysis suggests cognition, affect and behavior are all crucial variables needed to understand advertising effectiveness (Vakratsas & Ambler, 1999).

Based on the above statement, selecting the right spokesperson is one of the most important decisions an advertiser faces. Thus, in order to do so effectively, an understanding of the relationship between spokesperson characteristics and advertising effectiveness is needed so that the voice characteristics that can best enhance effectiveness can be identified (Whipple & McManamon, 2002). With these antecedents, the aim of this paper is to analyze how two key qualities of voice – gender and vocal pitch – affect the advertising effectiveness based on the hierarchy of effects model, which analyzes the impact of advertising in its cognitive, affective and conative stages.

Moreover, gender may be a key variable in moderating consumer's evaluative judgments (Holbrook, 1986). Indeed, males and females may use significantly different processing strategies and/or prefer to process different types of ad (Darley & Smith, 1995). If this is the case, one should ask oneself the following questions: are there any differences between male and female ratings in terms of effectiveness of advertising messages? Does listener gender play a moderating role in the influence of spokesperson gender on effectiveness? That is why this study also analyzes the role of listener gender in this process, that is to say, the influence of spokesperson gender in how the measures of effectiveness are rated.

## Background and hypotheses

The characteristics of successful radio spokespersons are wide-ranging and include a number of characteristics pertaining to both vocal communication and other nonvocal skills (Warhurst, McCabe, & Madill, 2013). In terms of the prosodic features of the voice, the acoustic qualities are basically pitch, intensity and duration. Spokespersons can use these qualities – for example through voice gender, changes in pitch, or an increase in intensity – to achieve different communicative aims in regards to their target audience. Based on the above, the hypotheses of this investigation are proposed based on two qualities of the voice that are intrinsically related: gender and pitch.

The variable 'gender' is the most studied resource of the voice in the literature on radio. Its advertising effectiveness has been studied, although with contradictory results

(Wolin, 2003). With our study, we attempt to contribute by determining whether the prevalence of male spokespersons detected by Monk-Turner, Kouts, Parris, and Webb (2007) – based on a investigation carried out in the USA – and Furnham and Paltzer (2010) – based on investigations in 26 countries – is justified. This predominance could be due to the existence of gender stereotypes in terms of voice characteristics that limit the presence of female voices (Rodero, Larrea, & Vázquez, 2010) and results in male voices prevailing when it comes to selecting a spokesperson (Rodero, Larrea, & Vázquez, 2012). However, it may also be due to the belief that since male voices are generally deeper, they seem more authoritarian, convincing and persuasive than female ones, as shown in Furnham and Paltzer's study (2010).

Moreover, despite the perception that male voices are more effective in advertising, Wolin's metaanalysis (2003), consisting in the analysis of three decades of gender-related advertising research, highlights there is some controversy on the subject. For instance in an experimental design on 60 individuals in Spain Rodero et al. (2010) and Rodero et al. (2012) show that there are no significant differences in terms of voice effectiveness, adequacy and recall regardless of whether the voice is male or female. In this line, Freiden (1984) in an experiment on 226 people divided by age (college students–adults) and gender (male–female), had already demonstrated that when using celebrities the gender of the endorser did not significantly affect spokesperson credibility and advertising effectiveness in television. Having said this, Rodero et al. (2012) and Whipple and McManamon (2002) conducted several investigations with experimental designs; their findings on a sample of 472 Spanish students, graduate and undergraduate for both gender-imaged and nongender-imaged products and a sample of 372 American Journalism students for three different products with clear gender ascriptions, respectively, suggest that spokesperson gender can affect advertising evaluation for a gender-specific product but not for nongender-imaged products. According to Wolin (2003), these discrepancies could be caused by the fact that firstly, many of the empirical studies did not report reliability assessments of the dependent measures, calling the reliabilities into question, and secondly, most empirical studies used students as subjects.

Considering the above and given that the advertised product was blood donation, which is a nongender-imaged product, we propose the following hypothesis:

**H1.** Spokesperson gender does not affect the advertising effectiveness of the radio spot on a non-gendered product.

One of the reasons for including vocal pitch as an explanatory factor in effectiveness is due to the possible interactive effect between both vocal qualities.

Chattopadhyay et al. (2003) consider that voice plays a decisive role in influencing the message recipient's response to advertising as it can attract listeners' attention and facilitate the generation of favorable responses. In fact, their study reveals that low-pitched voices exhibited more favorable advertisement-directed cognitive responses and more positive ad and brand attitudes. Similarly, various studies show that low-pitched voices are seen as more attractive

and generate more credibility for their audience, influencing advertising effectiveness (Rodero et al., 2010). Based on these results we formulate this hypothesis:

**H2.** Low-pitched voices generate higher advertising effectiveness than high-pitched voices on a non-gendered product.

Rodero et al. (2010) highlight the fact that few studies prove or reject the hypothesis regarding the higher level of effectiveness of male voices, despite the prevalence of male voices in radio communication. Most of these studies analyze the effectiveness of a voice based on their acoustic qualities, regardless of their gender. The importance of including spokesperson gender in studies on radio advertising is mentioned in Chattopadhyay et al. (2003). Although most studies reveal low-pitched male voices generate higher advertising effectiveness, this is not so evident in the case of female voices.

Thus, when these two factors, spokesperson gender and pitch, are considered together, the effect is expected to be multiplied; that is, a low-pitched male voice is expected to be the most effective combination in achieving a positive response. Furthermore, we propose this hypothesis:

**H3.** The combination of a male voice with a low pitch generates the highest advertising effectiveness on a non-gendered product.

Individual differences influence consumers' thinking, decisions and behavior and a key fundamental difference among individuals is gender (Stafford & Stafford, 2001). Research has suggested that men and women have different information processing styles (e.g., Darley & Smith, 1995; Meyers-Levy & Maheswaran, 1991), which generally translate into differences in the processing of promotional information (Darley & Smith, 1995; Meyers-Levy, 1989). Therefore, it is important to examine whether the effectiveness of the advertising depends on the gender of the individual. Meyers-Levy (1989) studies the gender differences in the interpretation of advertising, and she posits that men and women select different cues from the environment and interpret them in dissimilar ways. Rodero et al. (2012) indicate that women score the voices, in terms of voice effectiveness and adequacy, with higher averages than men. In addition, Carsky and Zuckerman (1991), in their study on three nongender products, showed that women assigned higher ratings to all aspects of the ads. Therefore, we formulate the following hypothesis:

**H4.** Women assign higher ratings in regards to attitude towards ads and attitude towards brands than men on a non-gendered product.

Furthermore, Carsky and Zuckerman (1991) no differences in the believability, persuasiveness, likelihood of use/purchase, or attitude toward the ad was associated with interaction between the gender of the endorser and the gender of the respondent. Similarly, Rodero et al. (2010) do not confirm higher advertising effectiveness of male voices in terms of attention and recall based on listener gender. However, in a later study (Rodero et al., 2012) they indicate that

there are differences in assessment between voices according to gender. These authors also show that men value the female voice more highly, while women give higher scores to the male voice. Here, the significant difference occurs because the degree to which women rate the male voice as more effective is much greater than the degree to which men rate the female voice. Despite the controversy in the results, we propose the following hypothesis:

**H5.** Exposing individuals to a spokesperson of the same sex does not affect advertising effectiveness on a non-gendered product.

## Materials and methods

### Participants

The population was based on the target audience of the radio spot, namely, both male and female, frequent radio listeners, and aged 18–55, who represent approximately 68 percent of the radio audience in Spain (AIMC-EGM, 2016). In doing so, we intended to overcome one of the limitations identified in the literature by using a wide sample, representative of the real radio audience, as opposed to the typical investigations that use students. Thus, we overcome this methodological limitation identified by Wolin (2003) as one of the possible causes of discrepancies in results on the influence of spokesperson gender or listener gender. In fact, Silvera and Austad (2004) note that the greatest potential problem with their research involves the use of research participants who were primarily students, which can limit external validity and thereby limit the generalizability of results.

The characteristics of this investigation are: (1) the use of a personal self-administered survey as an instrument with which to gather information; (2) a sample comprising 987 individuals, which means assuming a percentage error of +3.18 percent for a confidence interval of 95.5 percent; (3) the experiment was conducted by a group of trained survey-takers who were asked to recruit the participants from among their own network of relationships; and (4) the research was carried out at participants homes in order to guarantee controlled listening conditions in a laboratory environment and only among frequent radio listeners from the Canary Islands and the Community of Madrid.

The profile of the real sample shows a homogenous distribution between genders, a predominance of respondents aged 25 and above (82.3 percent), middle class citizens (81.5 percent), and with no university studies (61.8 percent).

### Stimuli

To test the hypotheses, the advertising format used was a 20-s ad, read by a single speaker to prevent the use of several voices from affecting the results. Four professional radio announcers from Radio Canarias-Las Palmas – two male (low-high pitches) and two female (low-high pitches) – collaborated in the production.

In order to avoid the bias detected by Rodero et al. (2012) and Whipple and McManamon (2002) in the reactions between men and women depending on whether the product



was targeted at one sex more than the other, the product chosen was blood donation, which can be considered neutral in terms of target audience gender. The Canarian Institute of Blood Donation and Blood Products (Instituto Canario de Hemodonación y Hemoterapia, ICHH) provided the following copy from an ad broadcast several years ago, aimed at both male and female targets aged 18–55: '*Voluntary, responsible and altruistic donation improves the quality and efficiency of our healthcare system. Blood and any of its components have an expiration date, so our aim is constant donations. This is a message from the National Institute of Blood Donation. Donate blood*'.

## Design

We designed a simulated radio slot into which we inserted a commercial block comprised of 4 ads; the first was the one we intended to test. At the beginning of the experiment, the respondents were told they were going to listen to a five-minute recording from a radio station; their task was to evaluate the program afterwards and the real aim of the investigation was not revealed to them.

To test the hypotheses, we used a 2 (low-high pitches)  $\times$  2 (male–female voices)  $\times$  2 (male–female listeners) factorial experimental design; this implied recording 4 versions of the radio spot we intended to test.

## Dependent variables

The dependent variables are the different measures of advertising effectiveness that include the three levels of response: cognitive, affective and conative.

On a cognitive level, effectiveness was measured using *unaided recall* on product category, brand and arguments, calculating intensity on 5 levels on a scale from 0 to 4 (Beerli & Martín, 1999; Mantel & Kellaris, 2003).

On an affective level, we used *attitude toward the ad* and *attitude toward brand*. *Attitude toward the ad* was measured using a 20 item 5-point Likert scale to evaluate three aspects, according to Bergkvist and Rossiter (2007) and Smit, Meurs, and Neijens (2006), which form part of the same construct: (1) liking, (2) the cognitive dimension of attitude to evaluate the information provided by the radio spot, and (3) the affective dimension of attitude to evaluate the creative strategy of the radio spot. *Attitude toward brand* was evaluated using a 6 item 5-point semantic differential scale.

Finally, on a conative level, *intention to donate* was measured on a single-item 5-point Likert scale, ranging from 'I am absolutely certain I would not donate blood' to 'I am absolutely certain I would donate blood' (Beerli & Martín, 1999).

The definitive items of these scales are shown in Table 1.

## Independent variables

Three dichotomous independent variables were used: *spokesperson pitch* (low–high), *spokesperson gender* (male–female) and *listener gender* (male–female).

Vocal pitch is produced by a series of openings and closings of the vocal chords in a unit of time, emitting

**Table 1** Categories of the intensity of unaided recall.

0	Cannot recall anything
1	Can only recall product category (blood donation)
2	Can recall product category and one of the characteristics of the radio spot
3	Can recall product category and brand or several characteristics of the radio spot
4	Can recall product category and brand and one or several characteristics of the radio spot

a continuous sound that is also known as fundamental frequency. The male fundamental frequency ranges from 80 to 200 Hz and the female one from 150 to 300 Hz (Soto Sanfiel, 2008). More specifically, Soto Sanfiel (2008) defines the range of the female voice as between 189 and 225 Hz for a high-pitched voice and between 115 and 151 Hz for low-pitched voice; high-pitched male voices range between 152 and 178 Hz and low-pitched ones between 98 and 125 Hz. To select the radio announcers, we measured the fundamental frequency of several announcers using the PRAAT program, which allows us to analyze, edit and manipulate audio with phonetic purposes. The spokespersons were asked to speak for about a minute, so that we could then measure all the acoustic data in order to obtain the fundamental frequency and classify their voices as high or low pitched.

Following the Soto Sanfiel (2008) criteria, the four selected spokespersons showed contrastive voices. The difference between high and low-pitched spokespersons ranged between 50 and 60 Hz, a distance that allows tones to be clearly distinguished.

## Validity analyses of the measurement scales

To evaluate psychometric properties of the multi-item scales – attitude toward the ad (Aad) and attitude toward the brand (Ab) – we used a confirmatory factor analysis (CFA), as well as the compound reliability coefficient and extracted variance analysis. The results show that: (1) all scales are valid and reliable and (2) the scale of Aad is three-dimensional and the scale of Ab is one-dimensional. The results of the CFA also indicated that the relationship between each item and its respective dimension was statistically significant ( $p < 0.001$ ), thus showing convergent validity. We can consider these measurement models as excellent, with CFI values greater than 0.95 and RMSEA values  $< 0.08$ . In addition, all the compound reliability coefficients are greater than the recommended value of 0.7 and all the AVE values are close to, or greater than, 0.5 (Table 2). These analyses of the psychometric properties of the scales guarantee the results and overcome another limitation identified by Wolin (2003), namely that most empirical studies did not report reliability assessments of the measures used.

Based on these results we created three variables, one for each construct. These variables correspond to the measures of the items of each dimension/construct. The items were weighted with the standardized estimators obtained in the CFA.

**Table 2** Confirmatory analyses.

Causal relationships		Standardized Estimators <sup>a</sup>	Composite reliability	Goodness of fit
Attitude toward ad (A <sub>ad</sub> )	Liking ← A <sub>ad</sub>	0.842 <sup>****</sup>	Construct reliability = 0.840 AVE = 0.638	CMIN = 214.789 p = 0.000 CFI = 0.954 NFI = 0.956 RMSEA = 0.075
	Cognitive attitude ← A <sub>ad</sub>	0.738 <sup>****</sup>		
	Affective attitude ← A <sub>ad</sub>	0.812 <sup>****</sup>		
	Credible ← cognitive attitude	0.656 <sup>****</sup>	Construct reliability = 0.834 AVE = 0.457	
	Informative ← cognitive attitude	0.583 <sup>****</sup>		
	Convincing ← cognitive attitude	0.762 <sup>****</sup>		
	Useful ← cognitive attitude	0.697 <sup>****</sup>		
	Clear ← cognitive attitude	0.694 <sup>****</sup>		
	Interesting ← cognitive attitude	0.652 <sup>****</sup>		
	Attractive ← affective attitude	0.847 <sup>****</sup>	Construct reliability = 0.814 AVE = 0.595	
Original ← affective attitude	0.774 <sup>****</sup>			
Dynamic ← affective attitude	0.685 <sup>****</sup>			
Attitude toward brand (A <sub>b</sub> )	It is bad–it is good ← A <sub>b</sub>	0.825 <sup>****</sup>	Construct reliability = 0.777 AVE = 0.483	CMIN = 3.859 p = 0.145 CFI = 0.998 NFI = 0.997 RMSEA = 0.031
	I dislike it–i like it ← A <sub>b</sub>	0.791 <sup>****</sup>		
	The quality is bad–the quality is good ← A <sub>b</sub>	0.700 <sup>****</sup>		
	It is not necessary–it is necessary ← A <sub>b</sub>	0.369 <sup>****</sup>		

\*\*\*\* p < 0.001.

\*\*\*\*  $p < 0.001$ .

## Results

A multivariate analysis of variance (MANOVA) was conducted to test the hypotheses. The dependent variables were the different measures of effectiveness: unaided recall, attitude toward the ad, attitude toward the brand and donation intention. The independent variables were spokesperson gender, spokesperson pitch and listener gender. Using Wilks' Lambda criterion ( $\Lambda$ ), three of the five effects tested provided significant multivariate statistics at 10 percent. The combined dependent variables resulted in significant main effects for spokesperson gender ( $F = 2.168$ ,  $p = 0.071$ , partial  $\eta^2 = 0.009$ ), spokesperson pitch ( $F = 2.198$ ,  $p = 0.067$ , partial  $\eta^2 = 0.009$ ) and listener gender ( $F = 1.998$ ,  $p = 0.093$ , partial  $\eta^2 = 0.008$ ). However, the two two-way interactions were not statistically significant: spokesperson gender by pitch ( $F = 1.259$ ,  $p = 0.284$ , partial  $\eta^2 = 0.005$ ), and spokesperson gender by listener gender ( $F = 0.808$ ,  $p = 0.520$ , partial  $\eta^2 = 0.003$ ).

In terms of the effect of spokesperson gender, the results show (Tables 3 and 4) significant differences in (1) attitude toward the ad ( $F = 6.585$ ,  $p = 0.010$ ), where the spots with female voices generate a more positive attitude ( $M = 3.227$  versus  $M = 3.083$ ), and (2) intention to donate ( $F = 3.499$ ,  $p = 0.062$ ), where spots with female voices generate a greater intentionality ( $M = 3.390$  versus  $M = 3.232$ ). These results lead us to reject H1, as spokesperson gender affects advertising on an affective and conative level, female voices being the ones that generate a more positive attitude toward the ad and generate more donation intention.

Contrary to the results on spokesperson gender, spokesperson pitch only affects cognitive effectiveness ( $F = 6.276$ ,  $p = 0.012$ ), since spots recorded with a low-pitched voice were the most recalled ( $M = 0.959$  versus  $M = 0.774$ ). Thus, we accept H2 only on a cognitive level,

even though in the other measures of effectiveness spots with low-pitched voices were also assigned higher ratings.

The results show that listener gender only affects conative effectiveness ( $F = 10.307$ ,  $p = 0.008$ ), since women are more willing to donate blood after being exposed to the ad ( $M = 3.414$  versus  $M = 3.206$ ). These results lead us to reject H4, although the results point in the same direction, as women assigned higher ratings on attitude toward the ad and attitude toward the brand.

The interaction between spokesperson gender and pitch only generates a multiplying effect on affective effectiveness. In terms of attitude toward the ad ( $F = 4.509$ ,  $p = 0.034$ ), results indicate that radio spots with high-pitched male voices are better valued ( $M = 3.129$  versus  $M = 3.037$ ); in the case of women the opposite is true, as radio spots with low-pitched female voices generate better attitudes toward ads ( $M = 3.290$  versus  $M = 3.155$ ). Chart 1 illustrates this result; low-pitched voices generate a better attitude toward the ad when the voices are female. However, among high-pitched voices there are no differences in terms of gender (Fig. 1). In terms of attitude toward the brand ( $F = 3.344$ ,  $p = 0.068$ ), the results show that radio spots with high-pitched male voices are better valued ( $M = 3.218$  versus  $M = 3.100$ ); in the case of female voices the situation is the opposite, radio spots with low-pitched voices being the ones that generate better attitude toward the brand ( $M = 3.305$  versus  $M = 3.210$ ). The results in Chart 2 show that attitude toward brand is better when the voices are female and low-pitched, whereas there are no differences among high-pitched voices (Fig. 1). These results lead us to reject H3 in the established terms, although the results do highlight the existence of an interaction effect between spokesperson gender and pitch that affects effectiveness in terms of attitudes toward ad and brand.

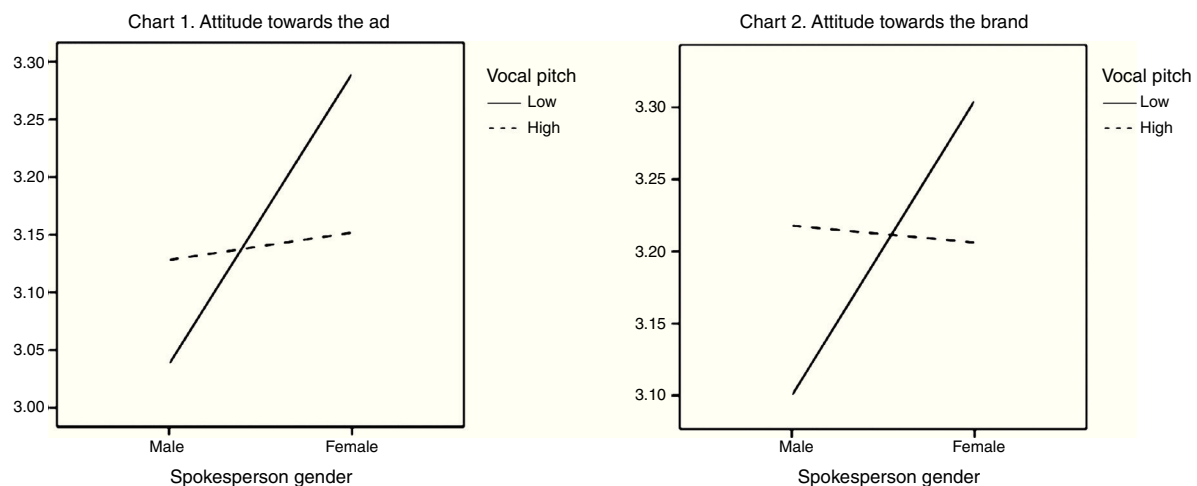
Finally, regarding the influence of congruence between spokesperson gender and listener gender, the results show

**Table 3** MANOVA results of multiple factors of advertising effectiveness.

Sources of variation	Unaided recall		Attitude toward the ad		Attitude toward the brand		Donation intention	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
<i>Main effects</i>								
Spokesperson gender-A	0.772	0.380	6.585	0.010	2.661	0.103	3.499	0.062
Spokesperson pitch-B	6.276	0.012	0.195	0.659	0.027	0.870	2.664	0.103
Listener gender-C	0.482	0.488	2.003	0.157	0.852	0.356	7.021	0.008
<i>2-way interactions</i>								
A × B	0.161	0.689	4.509	0.034	3.344	0.068	0.980	0.322
A × C	0.910	0.340	0.088	0.767	1.514	0.219	0.225	0.635

**Table 4** Means and SD of measures of advertising effectiveness as listener gender and spokesperson gender and pitch.

Measures	Gender pitch	Listener gender								
		Male listener			Female listener			Total		
		Male voice Mean	Female Voice Mean	Total Mean	Male voice Mean	Female Voice Mean	Total Mean	Male voice Mean	Female Voice Mean	Total Mean
Unaided recall	Low	1.025	0.976	1.000	0.991	0.852	0.917	1.009	0.913	0.959
	High	0.757	0.817	0.785	0.828	0.697	0.763	0.793	0.753	0.774
	Total	0.894	0.904	0.899	0.906	0.777	0.840	0.900	0.839	0.869
Attitude toward ad	Low	2.994	3.227	3.113	3.082	3.352	3.226	3.037	3.290	3.169
	High	3.112	3.126	3.119	3.145	3.180	3.162	3.129	3.155	3.142
	Total	3.052	3.181	3.116	3.115	3.269	3.194	3.083	3.227	3.156
Attitude toward brand	Low	3.063	3.241	3.154	3.140	3.369	3.262	3.100	3.305	3.207
	High	3.275	3.143	3.212	3.163	3.270	3.216	3.218	3.210	3.204
	Total	3.167	3.197	3.181	3.152	3.321	3.239	3.159	3.261	3.211
Donation intention	Low	3.124	3.389	3.259	3.393	3.578	3.492	3.253	3.484	3.374
	High	3.096	3.202	3.146	3.320	3.353	3.336	3.211	3.283	3.246
	Total	3.110	3.304	3.206	3.355	3.470	3.414	3.232	3.390	3.312

**Figure 1** Profile plots of interaction effects of spokesperson gender and pitch on advertising effectiveness.

there are no differences in effectiveness, thus H5 is accepted.

## Conclusions

Nowadays, radio advertising practice encourages gender discrimination that favors male voices regardless of objective criteria such as advertising effectiveness – an essential criteria in planning an advertising campaign. This is particularly relevant if we consider the role played by advertising as a socializing agent that transmits gender stereotypes. This situation led us to question whether the predominance of male voices in Spanish advertising was justified and, given the existing link between gender and vocal pitch, whether female voices were used less frequently regardless of their vocal pitch.

The first conclusion of this investigation is that the prevalence of male voices in radio advertising is neither justified in terms of effectiveness with nongender-imaged products. Similarly, the results of the interaction effect between spokesperson gender and vocal pitch do not justify the underuse of female voices, as low-pitched female voices are precisely the ones which generate more favorable attitudes toward the ad and the brand. We will now detail the empirical evidence that answers the issues formulated and that lead to a number of operational implications. We offer recommendations for optimizing radio advertising that will also hinder the perpetuation of gender discrimination against female voices and the promotion of completely unjustified gender stereotypes, in accordance with Lips (2003) about the pervasiveness of stereotypes and prejudices against women and the need to combat such attitudes.

The results of this paper allow to formulate recommendations to advertisers when planning their radio campaigns, which are relevant to achieving certain advertising goals related to the hierarchy model of advertising effects. Thus, in order to attract the listener's attention, improve notoriety or increase the audience's awareness of the product or brand, advertisers should use low-pitched voices, which increase levels of recall. This recommendation is useful for those advertisers with new brands and product categories for whom notoriety is one of the main aims of their campaigns. If their aim is to create or improve the audience's attitude toward the product or brand, the first step would be to create a positive attitude toward the ad, and then toward the brand. In this case, female voices are more effective, given their greater ability to modify attitudes. This is useful for advertisers who compete in product categories with a nongender-imaged product or in mature markets, where it is vital to reinforce and strengthen the differential attributes of the brand.

Among female voices, those with a low pitch are more effective given their ability to generate greater persuasion. However, if the campaign requires the use of a male voice, high-pitched voices should be used to modify attitudes. Lastly, if the aim is to change or generate a particular behavior, advertisers should use female voices, regardless of their vocal pitch.

On the other hand, the radio audience has a similar distribution in terms of gender and the literature indicates that men and women rate voices differently according to gender.

Taking this into account it is advisable to know firstly, if there are differences between men and women in advertising effectiveness and secondly, if listener gender plays a moderating role in the influence of spokesperson gender on effectiveness. This may or may not be considered to be confirmatory evidence for an evolutionary explanation, since, for example, high male voices may be less socially valued, simply because they deviate from the norm (Riding, Lonsdale, & Brown, 2006). This fact highlights a new aspect in this line of investigation for the analysis of the 2-way interaction between vocal pitch and listener gender and the 3-way interaction between spokesperson gender, vocal pitch and listener gender. Also women show greater intention to donate blood in the case of nongender imaged products. According to Chang and Lee (2011), the type of analyzed product could explain this result, as the altruistic appeal results in more favorable attitudes and higher behavioral intention for the female than for the male. In fact, an experiment in Sweden found that women are reluctant to become blood donors if money is offered to them whereas no such effect was found for males (Lacetera & Macis, 2010). These results highlight the lack of criteria when it comes to discriminating female voices per se in the context of radio advertising.

The main limitation of this study lies in the use of a single product that is also cataloged as a nongender-imaged product. Future studies could analyze the extent to which product gender moderates the influence of a spokesperson's vocal characteristics on the different levels of effectiveness. Thus, this investigation would need to be replicated with multiple products and/or gender-imaged products. Lastly, it would be interesting to test whether these results can be extrapolated to other advertising formats and furthermore to analyze the influence of other sociodemographic variables of listeners, such as age, culture, experience or degree of implication with the product.

## Conflict of interest

Authors declare absence of conflict of interest.

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