

Can children distinguish male and female voices?

Andrea Holler, Maya Götz

An IZI study surveyed 211 children to see if, when watching children's television programmes, they could tell whether a voice belonged to a man or a woman (or a boy or girl).

The voice is a complex vocal sound medium, which can give an impression of a person's appearance (Kiese-Himmel, 2016). Criminologists talk about a person's "acoustic fingerprint" (Pfister, 2001), and studies on children have proven a connection between voice volume and different personality traits and behavioural patterns: children who are extroverted and display a high level of prosocial behaviour, along with children who have problems dealing with peers, tend to speak louder. In contrast, conscientious children and adolescents with a high degree of emotional stability speak more softly (Poulain et al., 2018). When we hear voices, the main thing that we unconsciously evaluate is pitch. Early studies in this area of research were already able to ascertain stereotypes of attractiveness linked to the voice: if we like a voice, we attribute positive personality features to the speaker (Zuckerman & Driver, 1989). In the evaluation of women's voices, the tendency is for higher-pitched voices to be imagined as more attractive and as belonging to younger women – but also to women who are more vulnerable or helpless (Collins & Missing, 2003). A deeper vocal frequency is often associated with competence, and gives

an impression of trustworthiness and credibility (Krahé & Papakonstantinou, 2020), but is also interpreted as successful, assertive and dominant. One effect of this is that men and women with deeper voices tend to be more successful in occupying positions of leadership (Borkowska & Pawlowski, 2011).

The pitch of women's voices in particular has changed over the last 30 years. In the mid-1990s, the average speech pitch of (German) women was 200-220 hertz (Hz) (Braun, 1994), while a more recent representative study showed a frequency of 168.5 Hz for women and 111.9 Hz for men (Berg et al., 2017). So the gender difference has nearly halved. The biological parameters have not changed, but women are using their voices at a lower pitch. This development shows that the biological factors of vocal pitch are moderated by socialization (Zimman, 2018).

In children's programmes, a voice-over often serves as an authorial narrator, guiding viewers through the action. An analysis of children's television in 8 countries shows that the majority of

the programmes studied (73%) have no voice-over. 17% have a male voice-over guiding viewers through the action, and 5% have a female voice-over. 4% of the programmes alternate between a male and female voice-over (Götz et al., 2018). Can children tell whether the voice belongs to a man or woman, or a boy or girl? IZI surveyed children in 9 countries.

METHOD

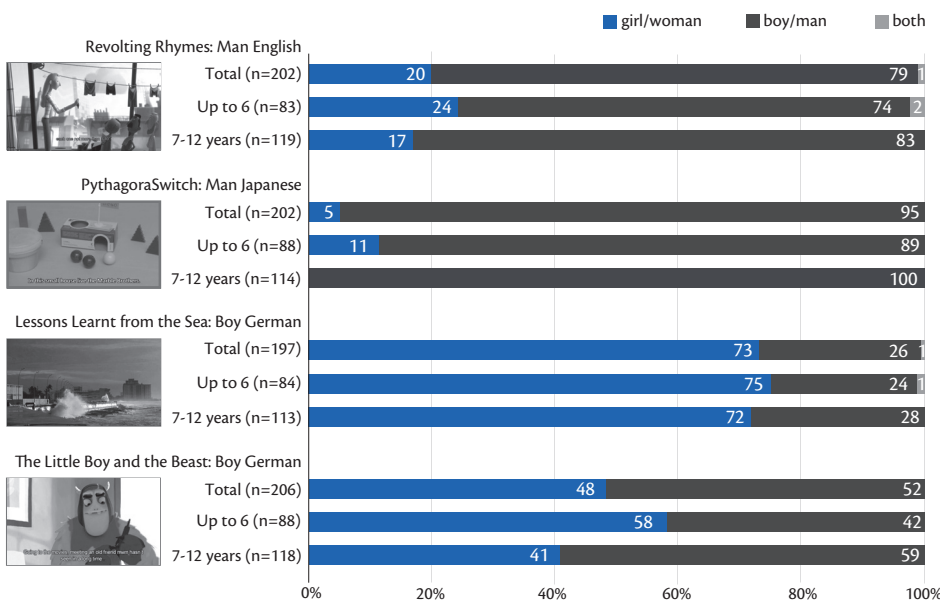
In the research series "Guessing Games" (see also Holler & Götz in this issue), 211 children in 9 countries were filmed watching extracts from programmes and giving their opinion afterwards. The 3- to 12-year-olds were given cards with simple symbols, to indicate whether they thought they could hear a boy or man, or a girl or woman. The cards with symbols allowed the children to vote intuitively and spontaneously after watching the extract. Depending on whether an adult or child had spoken in the previously shown video sequence, the children were asked either

"Who was talking here? A woman or a man?" or "Who was talking here? A girl or a boy?" The children then all simultaneously held up whichever picture they thought was right (Ill. 1). In total, they were asked about 8 extracts (each lasting between 6 and 39 seconds) from international children's programmes with voice-overs in different languages:



Ill. 1: The children participating in the IZI study held up picture cards to indicate if they thought the voice-over was spoken by a man/boy or woman/girl

RESEARCH



III. 2: Children answering the question “Who is talking?” in extracts with male speakers

1. Excerpt from *Revolving Rhymes* with a man’s voice speaking English
2. Excerpt from *I’m not a Pink Bike Girl* with a girl’s voice speaking Sami
3. Excerpt from *Woolly and Pip* with a woman’s voice speaking Dutch
4. Excerpt from *PythagoraSwitch* with a man’s voice speaking Japanese
5. Excerpt from *Lessons Learnt from the Sea* with a boy’s voice speaking German
6. Excerpt from *Spotty Wants to Fly* with a woman’s voice speaking Hakka
7. Excerpt from *The Little Boy and the Beast* with a boy’s voice speaking German
8. Excerpt from *The Gruffalo* with a woman’s voice speaking English

The children’s responses were then counted and analysed according to age- and gender-related tendencies. The small size of the sample from each country means that no statements can be made about regional differences. The most important findings are discussed below.

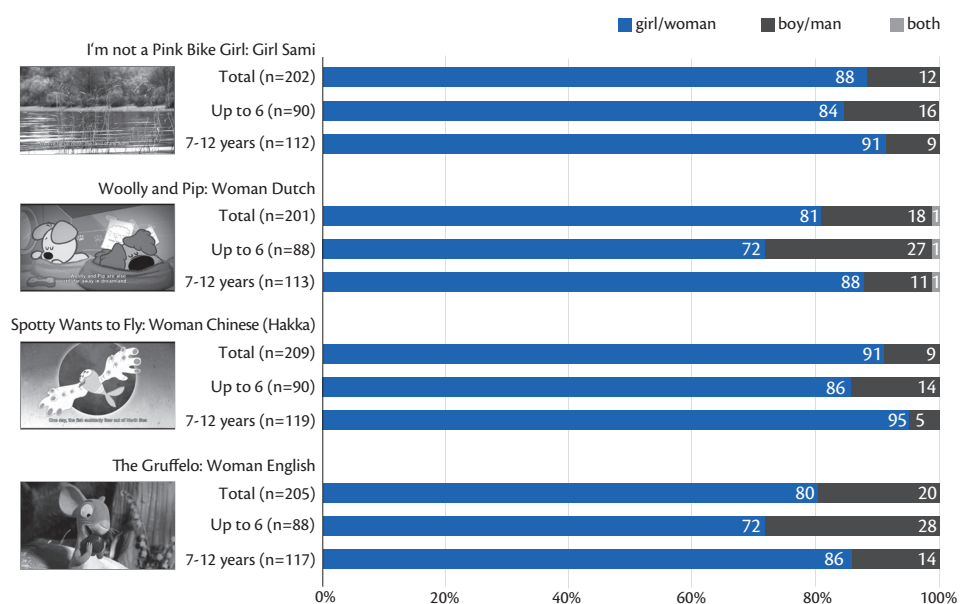
MEN’S VOICES ARE PERCEIVED AS SUCH

In the case of the extracts from *Revolving Rhymes* (BBC) with a British male voice, and from *PythagoraSwitch - The Marble Brothers’ Great Adventure* (NHK) with a Japanese male voice, the majority of children can identify the voice as that of a man.

However, 20% of the children think that the male voice in *Revolving Rhymes*, which speaks with a British accent, belongs to a woman. This may be due to the somewhat lighter tone of the man’s voice, but can probably be ascribed to the images in the animated programme, in which a blonde woman (a parody of Snow White) moves into an apartment in the city with 7 little men. This was the children’s first Guessing Game of this type, so they had not yet been trained by the research situation to listen attentively, but had focused their attention on the pictures – especially

as they did not understand the English content. This is the explanation given by some of the children, such as an 11-year-old girl from Thailand: “I saw the main character was a woman, a kind of cleaning lady. She had long hair.”

The Japanese male voice from *PythagoraSwitch*, which is deep and accentuated in timbre, is recognized as such by all the 7- to 12-year-olds and 89% of the pre-school children. The image shows balls



III. 3: Children answering the question “Who is talking?” in extracts with female speakers

that appear to be chasing each other on a complex marble run. The key factor in this decision is probably the deep pitch of the voice, or, as an 11-year-old boy from Thailand comments: “A man with a super bass-voice.” In all 9 countries, a deep male voice is identified as such by most children.

CHILDREN SOMETIMES IDENTIFY BOYS’ VOICES AS GIRLS’ VOICES

We asked the children to listen carefully to an extract from the German version of the series *The Day I Became Strong* (*Starke Geschichten aus aller Welt*). Here a boy talks in German about his adventures surfing on the coast of Havana. When the children are asked, after the short extract, whether a girl or a boy was speaking, 7 out of 10 say that they think it was a girl. There is no age difference here. The boys are more likely to assume that this is a girl’s voice than the girls themselves. In the case of the boy’s voice from *The Little Boy and the Beast* (ZDF), the children are not quite certain. Around half the children decide that it was a boy speaking, the other half assume it was a girl. Among the younger children (up to 6), over half (58%) assume that they are hearing a girl’s voice; in the 7 to 12 age group, 6 out of 10 children (59%) think it is a boy speaking. Overall it becomes apparent that a boy’s voice (before his voice breaks) is often identified as a girl’s voice by the children in this study.

CHILDREN CAN OFTEN RECOGNIZE WOMEN’S VOICES AS SUCH

In the extracts voiced by a woman, the majority of children guess correctly. In the case of a woman’s voice speaking Hakka, giving the authorial narration in a cartoon (*Spotty Wants to Fly*), 91% of the children know that this is a woman speaking. Besides the obvious explana-

tion (“It’s a woman”), a few children give spontaneous justifications for their assumption. The result is similar for the female speaker giving a commentary in Dutch on the adventures of two dogs (*Woolly and Pip*), and the woman’s voice telling the story of the Gruffalo. Both times, 8 out of 10 children know that this is a woman speaking, the older ones slightly more than the younger ones. Nonetheless, there are some children who insist on their view that this is a male voice, such as a 4-year-old boy from Ecuador, who states: “No! I think it’s a man!”

GIRLS’ VOICES ARE IDENTIFIED AS SUCH BY MOST CHILDREN

The children watched a short extract from the series *The Day I Became Strong*, in which a girl introduces herself in Sami and gives an introduction to the film (*I’m not a Pink Bike Girl*). The screen shows images of landscapes from the north of Norway. The girl’s voice is very high and childish. 88% of the children surveyed can assign the voice to a girl, the older children (91%) slightly better than the younger ones (84%). Besides the obvious statement (“a girl”) there are, in exceptional cases, more complex reflections. An 11-year-old boy from Thailand comments: “It’s a girl’s voice. In a high tone. Maybe it was dubbed by a ladyboy.” It is clear that most children recognize the girl’s voice as such.

SUMMARY OF THE FINDINGS

Children can often recognize women’s and girls’ voices and deep male voices as such. This suggests that – as with adults – a high-pitched speaking voice is preconsciously perceived as female. 7- to 12-year-olds more often make the correct assessment than those in the up-to-6 age group, and in many cases girls are more often right than boys. The only point where the children in all 9 countries often guessed wrong

was when assessing the voice of a boy whose voice had not yet broken. Here many children think they are hearing a girl’s voice. These findings are reflected in the practice of dubbing, where girls are quite often used to voice the parts of male protagonists.

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THE AUTHORS



Andrea Holler, M.A. in Media Pedagogy, Psychology and Sociology, is a Scientific Editor at the IZI, Munich, Germany. Maya Götz, Dr. phil., is the Head of the IZI and of the PRIX JEUNESSE INTERNATIONALE, Munich, Germany.