



# Gender and masculinity–femininity ratings of tracheoesophageal speech

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## Abstract

Tracheoesophageal (TE) speech is frequently characterized as low pitched and hoarse. In laryngeal speakers, these features are most often associated with males. Because lower pitch and hoarseness are anticipated for male and female TE speakers, one might predict that females are at risk for being perceived as male. The purposes of this pilot study were to assess the reliability and accuracy of listeners' perceptions of TE speaker gender and to evaluate the relationship between gender ratings and masculinity–femininity ratings. Twenty-five naïve listeners rated the gender and the masculinity–femininity of 12 TE speakers from audio recordings of a reading passage. Listeners were able to reliably rate gender and masculinity–femininity. They accurately identified speaker gender at a high rate that was comparable for males and females. However, female speakers, despite being accurately identified as female, were at an elevated risk of being rated as masculine or neutral on the masculinity–femininity scale.

**Learning outcomes:** As a result of this activity, the participant will be able to: (1) describe the reliability and accuracy of listener perceptions of the gender and the degree of masculinity–femininity of TE speakers; and (2) discuss the relationship between TE speaker gender identification and masculinity–femininity ratings for males and females, respectively.

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## 1. Introduction

Tracheoesophageal (TE) speech is often perceived as low pitched (Casper & Colton, 1993), hoarse, and sometimes strained (Kapusta-Shemie & Dromey, 1999; Most, Tobin, & Mimran, 2000; O’Leary, Heaton, Clegg, & Parker, 1994). In laryngeal speakers, lower pitch and hoarseness are more often associated with listener perceptions of male speakers rather than female (Mullenix, Johnson, Topcu-Durgun, & Farnsworth, 1995). Conversely, higher pitch, less hoarseness, and increased breathiness are more often associated with perceptions of a female voice (Andrews & Schmidt, 1996; Murry & Singh, 1980; Wolfe, Ratusnik, Smith, & Northrop, 1990).

In most instances, a lowering of pitch and a change in voice quality from laryngeal voice are anticipated for both male and female TE speakers (Casper & Colton, 1993; Trudeau & Qi, 1990). Because a low pitch and a rougher voice tend to signal a male talker, the changes that accompany TE speech are not likely to result in listener confusion of the male speaker’s gender. However, given the marked pitch decrease and voice quality change experienced by female TE speakers, listener confusion regarding the female TE speaker’s gender might occur. This is particularly the case if visual or other contextual cues are not available to the listener (e.g., phone conversations, communication partners not facing one another, etc.).

At present, there are no experimental data on the ability of listeners to identify a TE speaker’s gender from speech alone. However, in discussing the implications of their acoustic study of female TE users relative to esophageal speakers, Trudeau and Qi (1990) stated that, “. . . the female TE speaker will probably also experience similar problems with gender identification” (p. 249). Information on the ability of listeners to identify the gender of a TE speaker is important clinically. As Trudeau and Qi (1990) suggested, more informed pre- and post-operative counseling of female TE patients regarding the expected voice outcome would be possible. Although investigation is needed in this area, masculinization of the female TE voice could conceivably result in psycho-social as well as communication problems.

Listener perceptions of masculinity and femininity of TE speech samples also have not been investigated. While one might expect speakers’ ratings of gender and of masculinity–femininity to be strongly correlated, they are not necessarily identical perceptions. For instance, it is not uncommon for some voices to be consistently identified as male, but be judged as effeminate (Avery & Liss, 1996).

Interest in pursuing listener perceptions of both gender and masculinity–femininity of TE speakers is prompted by the results of two studies by Weinberg and Bennett (1971, 1972) on esophageal speech. Data from these two studies suggested that a fair amount of masculinization of the female esophageal voice occurred (inferred from fundamental frequency data), but listeners were still capable of identifying speaker gender with a high degree of accuracy. It could be that listeners can accurately identify female TE speakers as female, but the listeners may still perceive them as masculine-sounding.

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