

The Role of Acoustic Features In Elderly Adults' Voice Preferences

Abstract

This study investigates the acoustic features that influence elderly adults' perception of voices, offering insights into more effective communication strategies. Communication with elderly adults, the so-called "elder speech", is characterized by simplified wordings, exaggerated intonation, slower speech rates, or increased volume. However, the most effective approach is not always the most pleasing one. According to previous studies, purposely differentiating elderly adults from the younger generation was sometimes perceived as patronizing, which hinders intergenerational communication. Therefore, instead of analyzing effective approaches to communicate with elderly adults like most voice preference research did, this study seeks to examine the acoustic features elderly adults prefer while identifying the interaction between them.

A total of 72 stimuli were collected and modified using the software Praat by 3 pitch levels and 3 speech rate levels. The stimuli were recorded by native Mandarin speakers to minimize the risk of the voices sounding computer-generated. The stimuli were then manually adjusted so that each factor could be strictly controlled. 31 elderly adults over 65 years old were recruited to rate the recordings based on their preference (1: disfavored, 2: slightly disfavored, 3: favored, 4: very favored). Multinomial logistic regression with stepwise selection models was employed to assess the rankings of each acoustic feature and their interactions.

The analysis results identify acoustic parameters that yield a significant impact on the voice preferences of elderly adults, including speech rate, jitter, pitch range, and intensity range. The findings indicate that elderly adults prefer voices with a higher speech rate, lower jitter, lower pitch range, and higher intensity range. Speech rate is the most influential factor in voice preference, while a higher speech rate (3.62 syllables/sec) is more preferred. Lower jitter (1.82%) and lower pitch range exhibit a positive correlation with voice perception, aligning with previous findings in preference for voice stability and naturalness. A higher intensity range was also preferred, particularly when marked by a lower minimum intensity. Additionally, participant background (i.e., age) influenced these preferences, with older elderly adults (>75 years) favoring slower speech rate and lower pitch range. This suggested that age-specific adjustments to vocal characteristics could enhance communication effectiveness for elderly adults.

This study has three contributions. First, the present study analyzes elderly adults' voice preferences via Mandarin data, filling the gap in non-English acoustic preference studies. Second, it identifies the acoustic features that impact the voice preference of elderly adults as well as how these factors influence one another. Last, it explores the impact of age on voice preference, paving the way for communication strategies for a more targeted and inclusive audience. The present paper enhances the public's knowledge of elderly voice preferences,

contributing to improved design in hearing-based technologies and more effective cross-generational communication.