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PHONETIC AND INTONATIONAL MEANS OF EXPRESSING GENDER IN CHILDREN'S SPEECH

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Abstract. The expression of gender identity through language is a complex phenomenon influenced by social, cognitive, and biological factors. This article investigates the phonetic and intonational features employed by children to express gender in their speech. Drawing upon empirical studies and acoustic analyses, we explore how children of different genders utilize vocal pitch, formant frequencies, intonation patterns, and prosodic elements to signal gender identity and align with sociocultural gender norms. The findings highlight the early emergence of distinct phonetic and intonational strategies in children's speech, reflecting both innate predispositions and social learning. This study contributes to our understanding of language development, gender socialization, and the intersection of phonetics and sociolinguistics in childhood.

Keywords. Gender socialization, resonance, speech rate, intonation melody, articulation.

Introduction. Gender expression in speech is not merely a product of linguistic competence but also a reflection of social identity. From an early age, children begin to exhibit speech patterns that correspond with culturally defined gender roles. These patterns are shaped by the social environments in which children grow up, including their families, schools, peer groups, and exposure to media. The phonetic and intonational properties of speech, including voice pitch, resonance, speech rate, and intonation melodies, play significant roles in articulating and reinforcing gender distinctions. Voice pitch, for example, is often culturally interpreted as a marker of masculinity or femininity, while resonance and speech rate may further align an individual's speech with gender expectations. Intonation melodies can signal different emotional states or levels of assertiveness, which are also gendered in many societies. This paper focuses on how children deploy these vocal resources to express gender, examining the phonetic variables that mark masculinity and femininity in their speech. It also considers the social factors that influence these patterns, highlighting the intersecting roles of biology, environment, and social learning in the development of gendered speech. By exploring the ways children internalize and reproduce these vocal markers, this paper aims to provide a comprehensive understanding of the dynamic interplay between language, gender, and identity in early development.

Gender and Language Development. Previous research in sociolinguistics has demonstrated that gender differences in speech emerge early and evolve with age (Kreidler, 2002; Campbell-Kibler, 2010). These differences are influenced by both biological factors, such as physiological differences in the vocal apparatus, and socialization processes wherein children adopt speech styles modeled by adults and peers. In early childhood, boys and girls may already exhibit distinct phonological patterns, vocabulary choices, and pragmatic strategies in their communication. These distinctions become more pronounced over time, as children are shaped by a combination of innate predispositions and the linguistic expectations of their environment. For example, social norms often dictate that girls use more standard or prestigious forms of language, while boys may be encouraged to adopt non-standard or colloquial speech as a marker of group identity. Additionally, exposure to gendered language roles in media, family, and school settings further reinforces these differences, highlighting the dynamic and multifaceted nature of gendered language acquisition and use throughout development.

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Phonetic Indicators of Gender. In adult speech, fundamental frequency (F0) or pitch is the most well-documented phonetic correlate of gender (Gelfer & Mikos, 2005). Women generally produce higher pitch levels than men, a difference that has been consistently observed across various languages and sociolinguistic contexts. These pitch differences are attributed to both physiological factors, such as the shorter and thinner vocal folds typically found in women, and sociocultural influences that shape patterns of vocal expression. In addition to pitch, differences in formant frequencies—which are determined by the length and shape of the vocal tract—also play a significant role in the perception of gender through speech (Hillenbrand & Clark, 2009). Men's longer vocal tracts result in lower formant frequencies, lending a deeper and more resonant sound quality to their speech, while women's shorter vocal tracts yield higher formant values that contribute to a brighter vocal timbre. These phonetic features work together to cue listeners about the likely gender of a speaker, even in the absence of visual information. Additionally, research has shown that the degree of gender-related acoustic differences may be influenced by factors such as age, hormonal changes, and deliberate voice training or modification, demonstrating the complex and dynamic nature of gender representation in spoken language.

Intonation and Prosody. Intonation patterns, including pitch contour shapes, stress patterns, and speech melody, convey emotional, pragmatic, and identity-related meanings (Ladd, 2008). In spoken language, intonation refers to the way in which the voice rises and falls, creating a musical quality that enhances communication beyond the literal meaning of words. This prosodic information helps listeners interpret questions, statements, emotions, and even sarcasm based on tone and emphasis. Research suggests that females often use wider pitch ranges and more varied intonation compared to males, contributing to perceived femininity (Bucholtz, 1999). For instance, female speakers may employ greater fluctuation in their pitch and place more emphasis on certain syllables or words to express nuance, subtlety, and affect. This contrast in intonational habits not only affects how speech is perceived regarding gender identity but also influences social impressions, interpersonal communication, and listener engagement.

Phonetic features in children's gendered speech

Pitch (Fundamental frequency). Studies indicate that by the age of 3 to 4, girls tend to produce higher average pitch levels than boys (Falk et al., 2011). This difference is not explained by anatomy alone at this age, as laryngeal size differences are minimal pre-puberty, suggesting social reinforcement in pitch usage. In detail, while both boys and girls have similarly sized vocal tracts and larynges before puberty, the observed divergence in pitch may be shaped by environmental or cultural influences. Adults and caregivers may unconsciously reinforce higher or lower pitch patterns in children according to perceived gender norms. Additionally, some researchers posit that children may imitate the speech patterns of adult role models of the same gender, further contributing to this early gender-related pitch differentiation. Thus, the development of pitch characteristics in early childhood appears to involve a complex interplay between biological and social factors, rather than solely anatomical development.

Voice quality and resonance. Although less consistently studied, children display gender-related differences in voice quality. Girls often exhibit a clearer, breathier voice quality, whereas boys may have a more pressed or creaky voice at times (Garnica, 1977). These qualities affect perceptions of gender identity during interactions. Voice quality differences not only include clarity and breathiness versus pressed or creaky tones, but may also involve subtle variations in pitch, volume, and resonance. For example, girls' voices can tend to sound lighter, with a smoother timbre and less vocal fold tension, while boys' voices occasionally present a deeper or rougher quality, sometimes sounding more strained when trying to assert themselves. These distinct vocal patterns are often noticed by listeners and can unconsciously influence how they perceive and interpret a speaker's gender,

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especially in situations where gender identity is being established or communicated through spoken interaction. Additionally, these vocal attributes can interact with linguistic and nonverbal cues, further shaping gender-related impressions throughout social exchanges.

Speech rate and articulation. While findings are mixed, some research shows that girls tend to speak more quickly and with more precise articulation than boys (Wolfram, 1994), potentially reflecting socialized speech norms. Girls may be not only faster in their verbal delivery but also demonstrate clearer enunciation and control over the production of individual sounds and syllables within their speech. These tendencies could be associated with both environmental factors, such as differences in how teachers or caregivers may interact and provide feedback to girls compared to boys, and intrinsic or developmental aspects. As girls may be encouraged to model careful and deliberate speech from a young age, they might develop habits of articulation that promote efficiency and clarity in communication, whereas boys might experience less reinforcement or even different expectations regarding speech patterns. Nevertheless, it is important to acknowledge that the evidence is not entirely consistent in this area, and variations in individual speech rate and articulation skills are influenced by a broader range of factors including personality, cultural context, and educational background.

Intonational patterns and gender expression in children

Pitch range and variability. Girls' speech is characterized by greater pitch variability and wider pitch ranges (Barrett, 2008). This intonational dynamism is often associated with expressiveness and emotional openness in sociocultural contexts. In more concrete terms, this means that girls generally use a broader spectrum of high and low notes and demonstrate more noticeable shifts in the melody of their speech. Such vocal expressiveness is frequently linked not only to individual temperament, but also to broader cultural expectations that encourage greater emotional expression and communicative warmth in girls. Over time, this tendency may contribute to perceptions of girls as more emotionally attuned or approachable in conversation, reinforcing the impact of pitch as both a linguistic and social marker in communication.

Use of rising intonation. Rising intonation, often signaling uncertainty or inviting response, is reportedly more frequent in girls' speech (Coates, 2013). In children's conversations, this pattern may function to facilitate social bonding. For instance, when a speaker ends a statement with a higher pitch, it can indicate that they are seeking confirmation, validation, or engagement from listeners, thereby opening up space for others to contribute to the conversation. This communicative strategy may also help foster a more inclusive and collaborative atmosphere, supporting the development of friendships and group cohesion among children. Furthermore, some researchers suggest that the tendency to use rising intonation can reflect broader socialization patterns, where girls are encouraged to adopt more affiliative and less authoritative conversational styles in order to maintain group harmony and minimize conflict.

Prosodic features and gendered identities. Beyond pitch, prosodic cues such as timing, rhythm, and intonation are utilized differently by boys and girls to perform and construct gendered identities (Eckert & McConnell-Ginet, 2003). Research has shown that girls, for example, may employ more varied and dynamic stress patterns, as well as more expressive intonation contours, to create engaging, nuanced, and emotionally resonant speech, thereby reinforcing socially recognized markers of femininity. Boys, conversely, might rely on more monotonic or restrained prosodic patterns, which can align with cultural expectations of masculinity. These subtle differences in the use of prosody contribute to the continuous negotiation and performance of gender in spoken interaction.

Socio-cultural influences and implications. Gendered speech patterns arise from interactions between biological predispositions and cultural norms. Children learn and reproduce these patterns through peer interactions, media exposure, and adult modeling (Tannen, 1994). Understanding the

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phonetic and intonational markers of gender expression in children aids in identifying how gender identities are constructed and performed linguistically from an early stage.

Methodologies in studying gendered speech in children. Research methods typically involve acoustic analysis of recorded child speech samples, perceptual studies assessing listener gender attribution, and ethnographic observations. Technological advances enable precise measurement of F0, formants, and prosodic patterns. Cross-linguistic studies further reveal how cultural context shapes phonetic gender expression (Cutler et al., 1990).

Conclusion. Children employ a variety of phonetic and intonational means to express gender, manifesting both biological and social aspects of language development. Pitch, voice quality, and intonation patterns serve as markers that signal conformity or resistance to gender norms. Future research should explore the dynamic interplay between identity, language use, and socialization in diverse cultural settings to deepen our comprehension of voice and gender in childhood.

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