

Factors Affecting Speech Naturalness in Young Adults with a History of Cleft Palate

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Purpose

- 1. Which variables, if any, can help predict perceived speech naturalness in young adults with a history of cleft palate with or without cleft lip?
- 2. Does the knowledge of a diagnosis of “cleft palate” influence listener’s perceptual ratings of speech naturalness?

Participants

- Talkers:
 - 35 listeners with history of non-syndromic CP ± CL
- Listeners:
 - 10 blind listeners were provided no information regarding talkers.
 - 10 unblind listeners were told that each talker had a history of CP ± CL. These listeners were also provided with a written and verbal overview of cleft palate.

Procedures

- Lazy Jack passage: phonemically balanced connected speech sample.
- Most recent recording between the ages of 15.5 and 21 years.
- Digitized, equalized, and randomized.

Methods

- Information about cleft palate provided to unblind group.
- Bilateral hearing screening.
- Asked to rate speech naturalness of the 35 talkers:

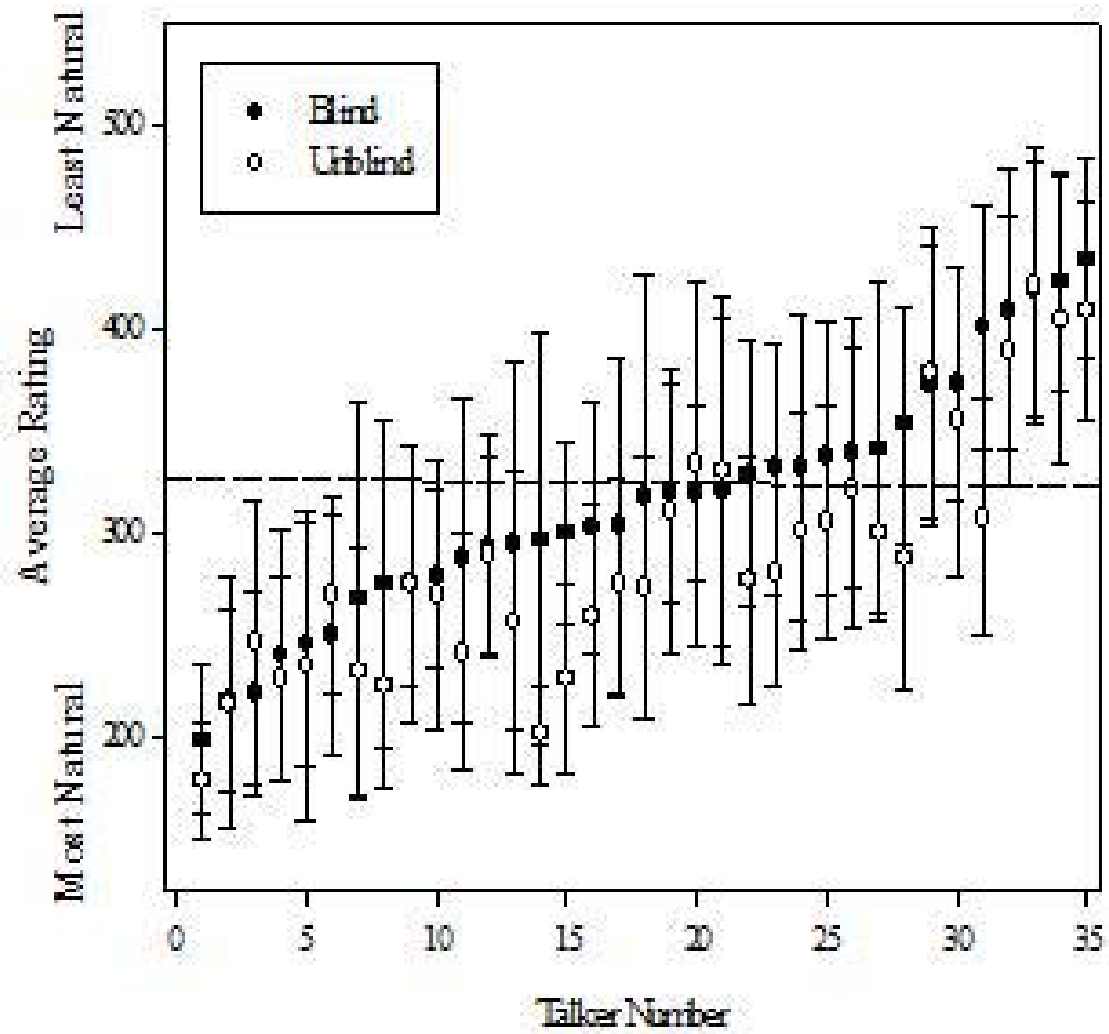
“Typical speech you would expect to hear in any given situation.”

Visual Analog Scale



Analysis 1

- Comparison of mean ratings given by blind and unblind groups across listeners:
 - Non-parametric Mann-Whitney U test
 - Mann-Whitney $U=36$, Wilcoxon $W=91$, $z=-1.058$, $p>0.05$
 - Trend for higher ratings for unblind group.
 - **Not significant.**
- Comparison of mean ratings made by each group for each individual talker:
 - Wilcoxon Signed Ranks test
 - $P=...$
 - Unblind listeners gave more natural ratings.
 - **Significant.**



Analysis 2

- Dependent variable: Perceptual rating
- Independent variables:
 - ✦ Gender
 - ✦ Age at primary palatal repair
 - ✦ Age at insertion of first set of PE tubes
 - ✦ Percentage of hearing screenings passed at team visits
 - ✦ Years in speech therapy
 - ✦ Resonance ratings at age 13
 - ✦ Articulation ratings at age 13
- Stepwise regression analysis
- $F[7,27] = 3.947, p = 0.004, R^2 = 0.51$
- Combined, these accounted for over 50% of variance.
 - Only articulation ratings at age 13 was significant.

Analysis 3

- Rate of Speech
 - Syllables/second
 - Regression analysis
 - Accounted for >60% of variance, with additional 14% by articulation ratings at age 13.

Blind group

Speech rate: 55.2%

Articulation at age 13: 9.5%

Unblind

Speech rate: 57.1%

Articulation at age 13: 18%

Discussion

- Tendency for individuals who are aware of the diagnosis of CP ± CL to rate speech as more natural.
- Most important early variables correlated with positive speech outcomes in adolescents were rate of speech and articulation ratings at age 13.

Future research

- Examining impact of knowledge of diagnosis on cleft: higher number of subjects
- Which articulation errors are associated with negative speech outcomes
- Continually earlier variables impacting speech outcomes