UNIVERSITÄT DES SAARLANDES

WS 23/24 Sound Change

RESONANCE OF EQUALITY

Unveiling the Correlation Between Gender Equality and F0 Dynamics in Miss Universe Candidates Across Five Decades

AUTHORS

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01 BACKGROUND & INTRODUCTION

- **Significant decrease in Speaking Fundamental Frequency** of Australian women aged 18-25 years **over approximately 50 years**. Similar trends in Sweden, the United States, and Canada (Pemberton et al., 1998)
- **Preference for leaders with lower-pitched voices** by both men and women suggests a **biological influence on leadership choices** and the **observed decline in female voice pitch over time** (Klofstad et al., 2012)
- **Present study**: examining the **change of female fundamental frequency** (F0) in the top 5 Miss Universe interviews over 53 years and its **correlation with the Gender Equality Index** (GEI)

02 RESEARCH QUESTIONS

- Have **advancements in gender equality** (GE) led to **decreased female F0** in public settings?
- Is there a **correlationn between lower F0** and **enhanced GE**?

03 DATA & MODEL

Equality Index Data

- **GEI**: **Aggregation of** Historical Gender **Equality** (1950-2003) and UN Gender **Inequality** Indices (1990-2021)
- **Convert Gender Inequality index into Equality Index** with a regression model
  - Training: Historical Gender Equality Index as DV, UN Gender Inequality Index as IV
  - Output: predicted Gender Equality Index value for each country from 2004 to 2021
- **MSE for validation** against overlapping values from 1990 to 2003

Audio Data

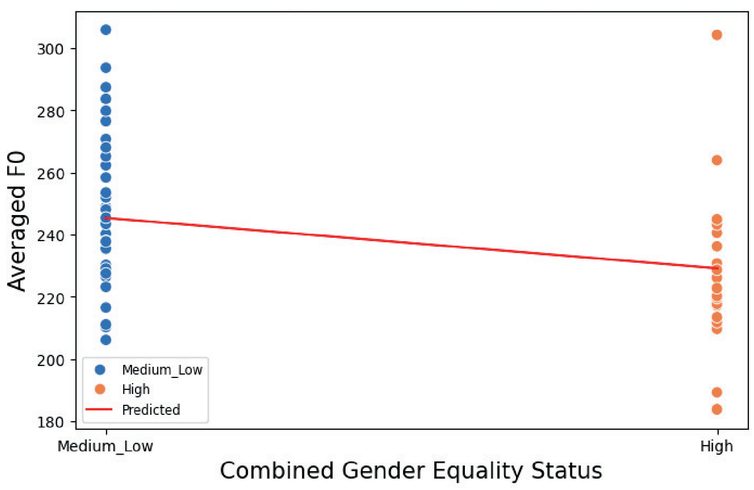
- **F0** extracted from **interviews of Miss Universe top 5** (1965-2018; interval of 2-6 years) using **Praat**'s noise reduction function
- **3 Categories of GE status** instead of country names for each year using thresholds based on the given year's GEI statistics
  - **High** (⩾ 25%), **Medium**, **Low** (< 25%)

Model

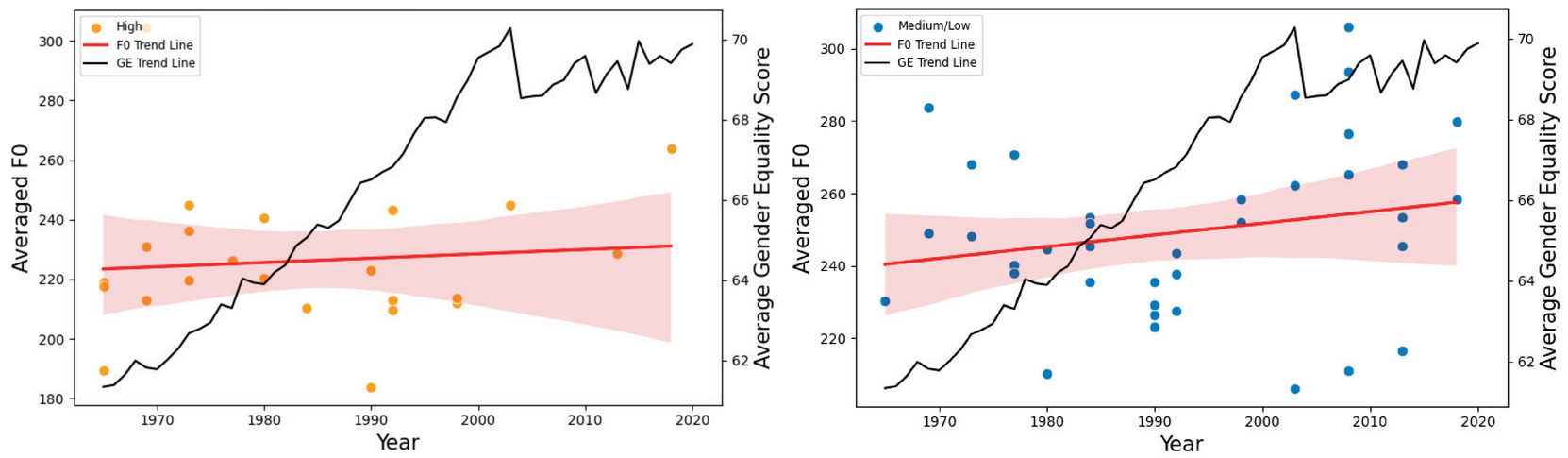
- **Linear Regression Model**: investigation of correlation between the average F0 and GEI across 28 countries and five decades

05 RESULTS & ANALYSIS

<F0 and GE Status Correlation>



<Trends of Averaged F0 over Years per GE Status>



06 CONCLUSION

- **The higher the GEI, the lower the F0, but not over the years**: for each unit increase in GEI, F0 decreases by about 23.4 units (starting from a base value of 246.32Hz; adult women's average pitch range: 165 to 255 Hz) if the year factor is not considered
- **Rising F0 trends across all countries during the period studied**, possibly influenced by data from Miss University that emphasizes femininity

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