

# ORAL CORPUS OF SPANISH MALE TWINS AND SIBLINGS: Forensic-phonetic application and further uses

CILC – Univ. Alicante  
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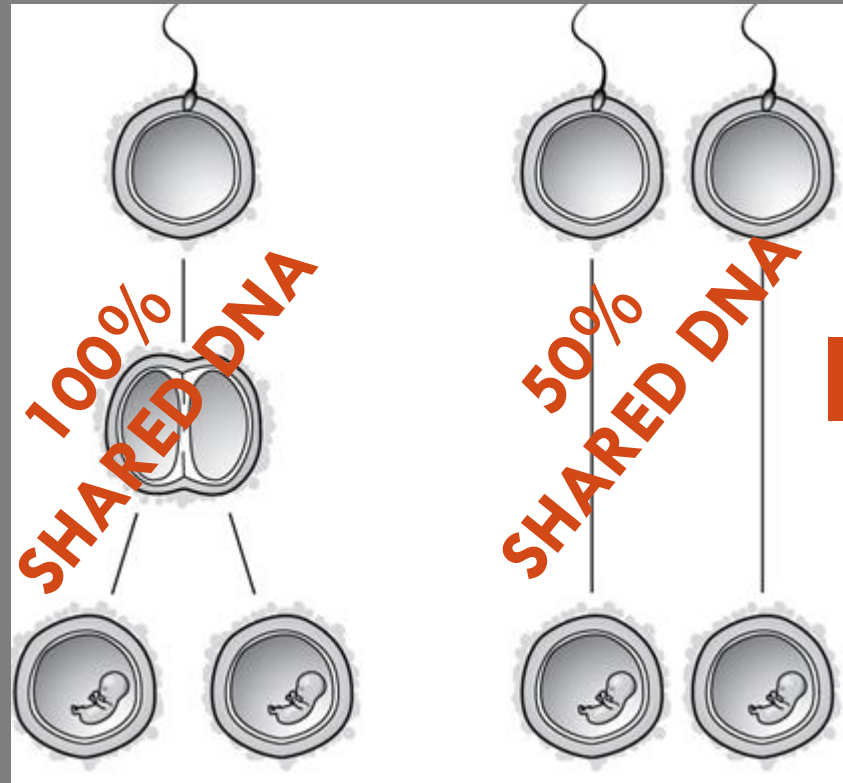
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# 1. INTRODUCTION

Monozygotic

Dizygotic



= Siblings

# 1. INTRODUCTION

## What is Forensic Phonetics (FP)?



OFFENDER



SUSPECT 1



SUSPECT 2



SUSPECT 3

# 1. INTRODUCTION

## Why studying twins in FP?



- Extreme physical similarity (voice too)
- Challenge in speaker identification
- Explore the limits of between-speaker variation and within-speaker variation



# 1. INTRODUCTION

- Criteria for selecting a FP parameter (Wolf 1972)



- 1) naturally and frequently present in normal speech
  - 2) easy to measure
  - 3) **have the highest possible inter-speaker variability and the minimal intraspeaker variability**
  - 4) resistant to disguise
- ...

- IAFPA Annual Conference 2012



- Fundamental frequency (F0)
- Formant frequencies
- Formant trajectories
- Voice quality
- Temporal parameters
- .....

## 2. THE TWIN METHOD

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### MZ twins vs. DZ twins

- Compares their resemblance
- Widely used in Medicine and Psychology
- Aim: estimate the **environmental** and **heritable** factors that contribute to certain behavioral traits or complex system of features

# 3. TWINS...

## In Forensics or Biometrics

- Discriminability of handwriting (*Srihari, Huang & Srinivasan 2008*)
- DNA Profiling (*Rubocki et al. 2001*)
- Fingerprints (*Jain, Prabhakar & Pankati 2002*)

## In Voice Studies

Average sample size of the "corpora"?

Data collection method?

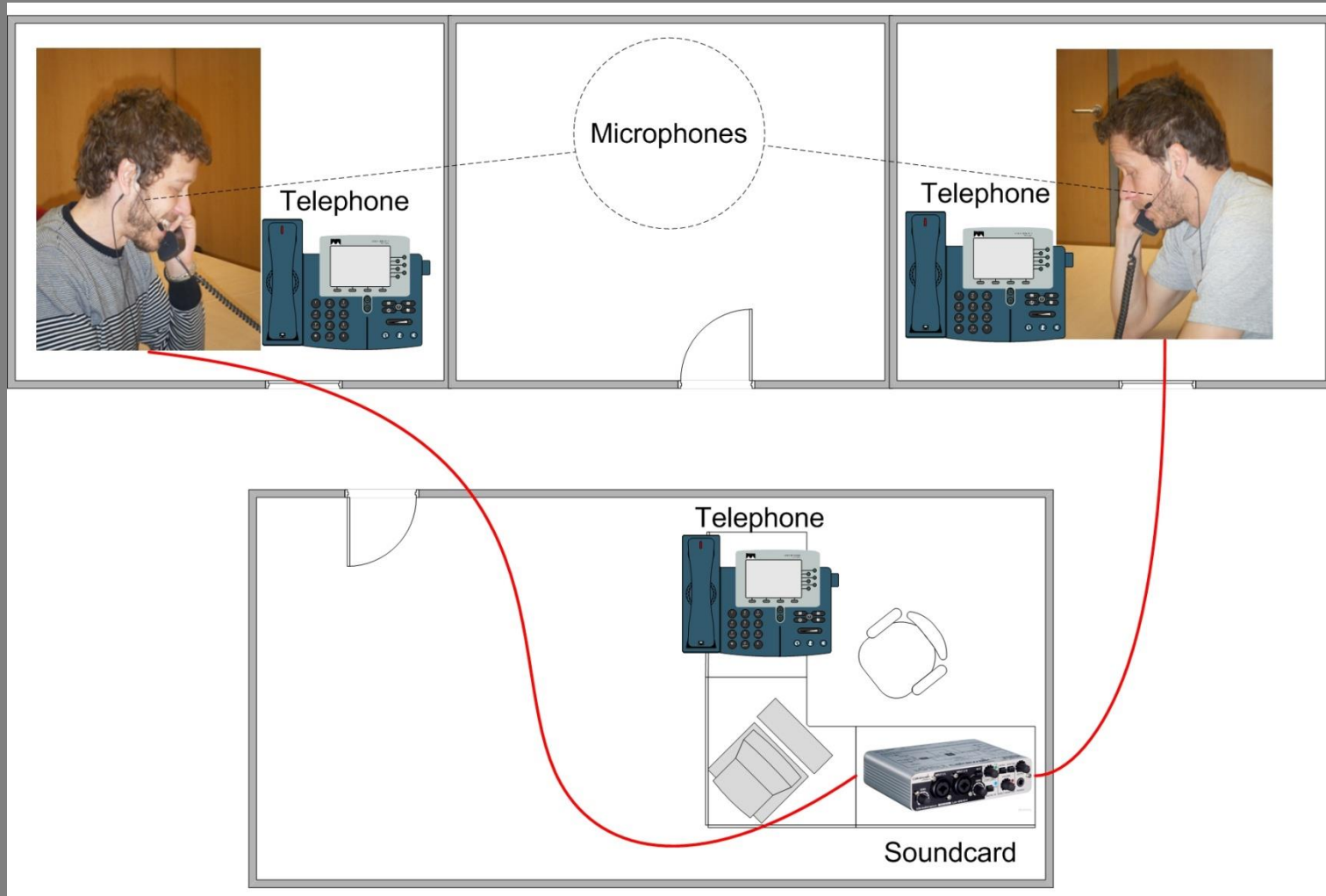


# 4. OUR CORPUS

MZ twins	DZ twins	Brothers	Reference population
24	10	8	12
Male			
28.96 years (mean)			
Castillian Spanish			
No voice pathologies			
No hearing difficulties			

**IAFPA GRANT**  
**San Segundo and**  
**Künzel**

# Data collection



# Speaking tasks

- 1) Semi-structured spontaneous conversation between twins
- 2) Fax exchange to elicit specific vocalic sequences
- 3) Reading of two phonetically-balanced texts
- 4) Informal interview with the researcher

+

## VOCAL CONTROL TECHNIQUE

- Maximum Phonation Time (MPT)
- S/A Ratio

# Data collection

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## **FORENSIC REALISTIC:**

1. Non-contemporaneous speech samples (2-4 weeks)
2. High-quality recordings + telephone filtering
3. Different speaking styles

# Telephone Filter



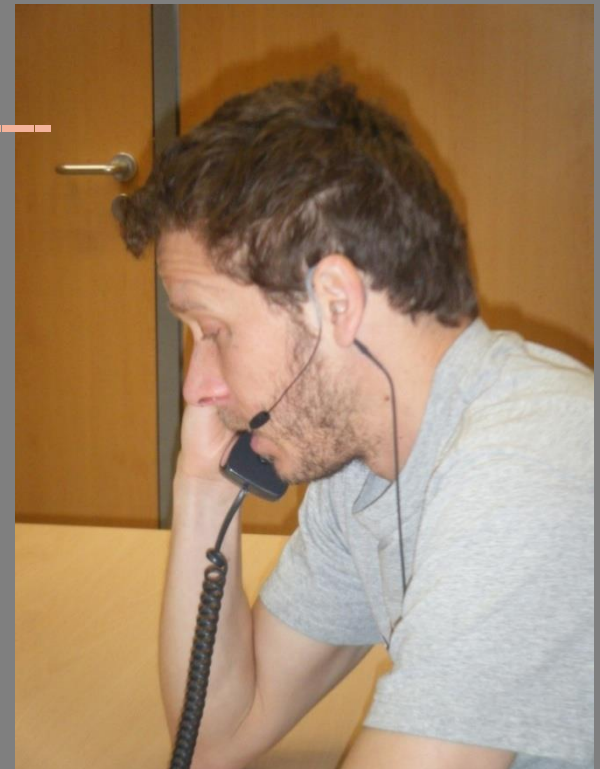
# 5. What has been done so far...

- San Segundo, E. (2012) Glottal source parameters for forensic voice comparison: An approach to voice quality in twins voices, *Proc. 21th Annual Conference of the International Association for Forensic Phonetics and Acoustics (IAFPA) 2012*, Santander, Spain.



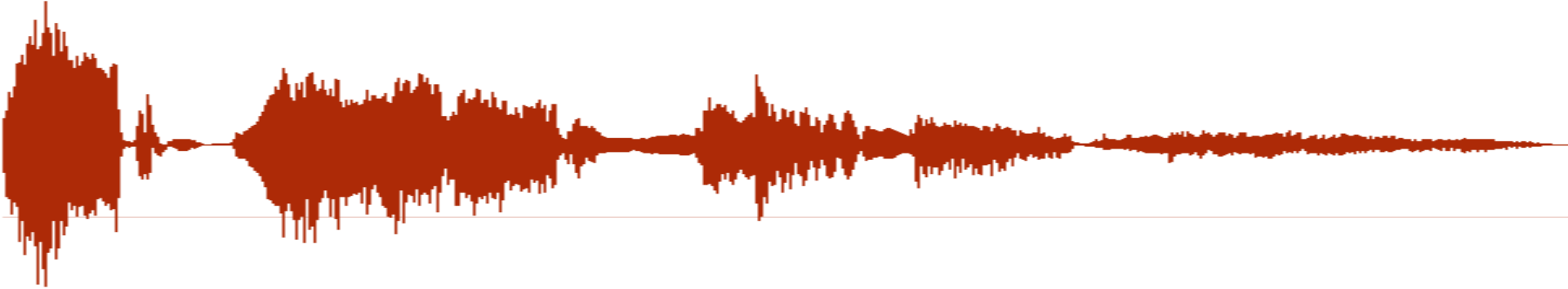
## PAUSE FILLERS

**BIOMECHANICAL  
ESTIMATES OF THE  
VOCAL FOLD:  
dynamic mass,  
stiffness, ...**



# ...what could be yet done

- Other linguistic uses?
  - Variation in vocalic sequences:  
*Sui.za?* *Su.i.za?*
  - Paralinguistic features
- Encourage new research on twins
- Enlarge the corpus
- Female voices



**THANK YOU FOR YOUR ATTENTION!**

**UIMP**  
Universidad Internacional  
Menéndez Pelayo



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