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## **A Simplified Approach to Quantifying a Child's Bilingual Language Experience**

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# A simplified approach to quantifying a child's bilingual language experience

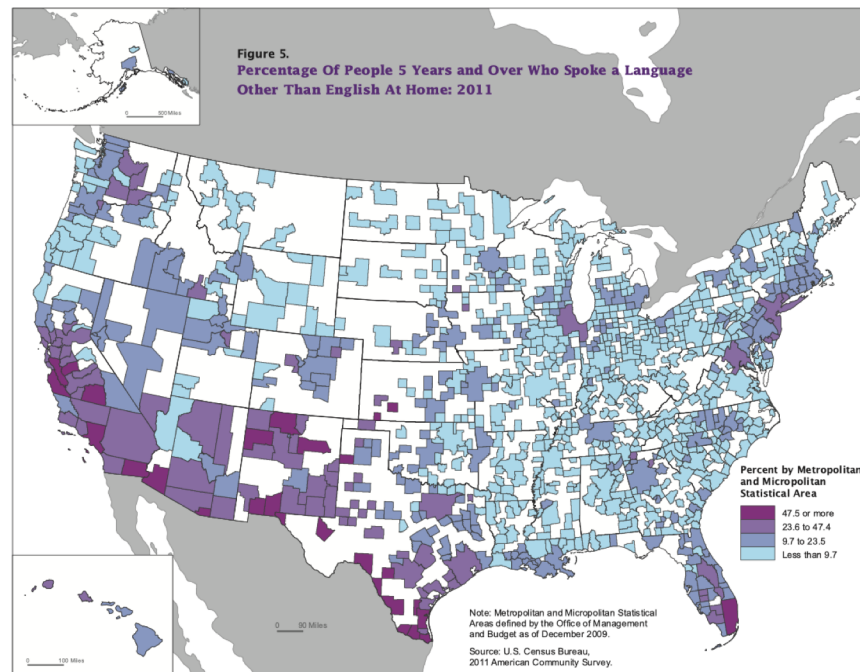
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Faculty Mentor: Dr. Lauren Calandruccio, Department of Psychological Sciences



# Changing U.S. Demographics

- ❑ Estimated that 1 in 4 children in U.S. will speak a language other than English by 2020
- ❑ Need for accurate and efficient methods to capture linguistic experience for bilingual children during audiological evaluations
- ❑ Currently no standard for the collection of linguistic information



## **Challenges to collecting bilingual linguistic information:**

**Variability among  
interpreters**

**Time constraints**

**Lack of bilingual staff**

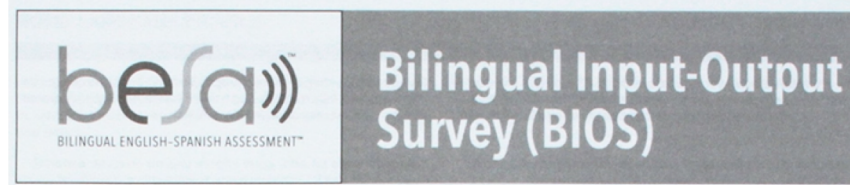
# Motivation

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- Need for accurate and efficient capturing of linguistic complexities for large sample of bilingual children across multiple clinical sites
- Need for quantitative data that captures current exposure (listening) to and usage (speaking) of English/Spanish



# BIOS



- Part of larger assessment BESA, including 2 components: BIOS-Home and BIOS-School
- Provides linguistic exposure and usage information via BIOS Score Summary
- Parent report of what language child hears and uses during typical weekday and weekend day on hourly basis
- Focus on BIOS-Home

# Objective of Current Analysis

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To determine if the BIOS-Home survey can be condensed into a simpler format that specifies larger blocks of time that effectively captures the same input (what is heard) and output (what is said) information as the hourly information of the full-length BIOS-Home

# Methods

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83 bilingual  
Spanish/English children  
recruited

Ages: 4.2 – 16.9 years  
Mean age: 9.7 years  
SD: 4 years

42 children tested at  
BTNRH

41 children tested at  
UNC

BIOS-Home  
administered to  
parent/caretaker of  
child

Parental  
questionnaire  
administered to same  
parent/caretaker



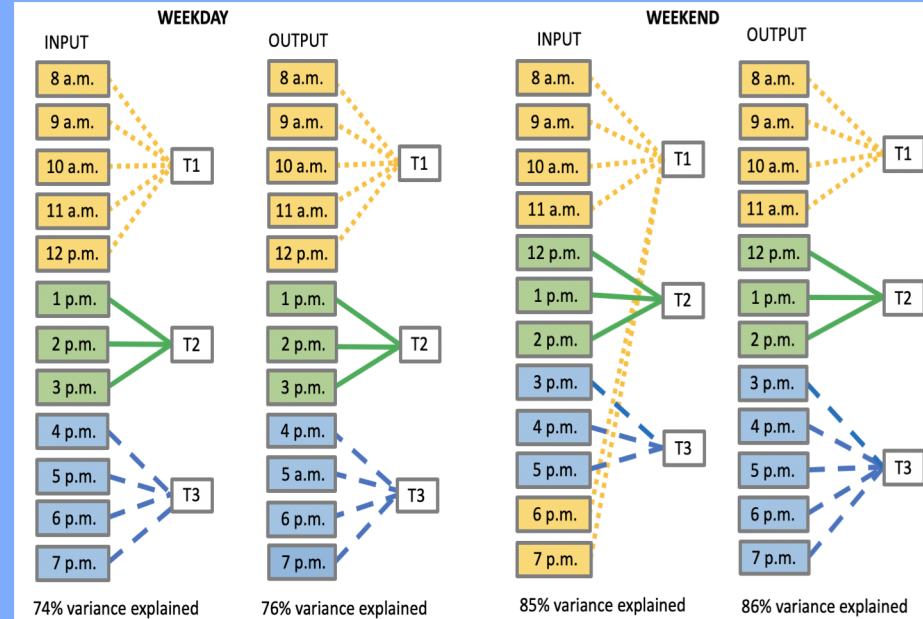
# Statistical Methods

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- ❑ Summary statistics used to understand demographic information of 83 bilingual children and families:
  - ❑ Family income
  - ❑ Guardian education level
  - ❑ Age of immigration to the US
  - ❑ Parent rated language proficiency
  - ❑ Age of exposure to English and Spanish
- ❑ Utilized a factor analysis for the BIOS-Home specifying 3 time intervals that tended to yield the same response from participants

# Results

- ❑ The different groupings (indicated by color) represent the time factors (T) that were most frequently recorded as the same language from the BIOS-Home using a factor analysis
- ❑ Results indicated that using only three time factors could explain:
  - ❑ 74% of the variance in input language on weekdays
  - ❑ 76% of the variance in output language on weekdays
  - ❑ 85% of the variance in input language on weekends
  - ❑ 86% of the variance in output language on weekends of the full BIOS-Home



**On a typical weekday:**

<b>Between the hours of:</b>	<b>Which language is most frequently heard?</b>
8AM – 12PM	English, Spanish, or both languages equally
1PM – 3PM	English, Spanish, or both languages equally
4PM – 7PM	English, Spanish, or both languages equally

<b>Between the hours of:</b>	<b>Which language is most frequently spoken?</b>
8AM – 12PM	English, Spanish, or both languages equally
1PM – 3PM	English, Spanish, or both languages equally
4PM – 7PM	English, Spanish, or both languages equally

**On a typical weekend:**

<b>Between the hours of:</b>	<b>Which language is most frequently heard?</b>
8AM – 11AM & 6PM – 7PM	English, Spanish, or both languages equally
12PM – 2PM	English, Spanish, or both languages equally
3PM – 5PM	English, Spanish, or both languages equally

<b>Between the hours of:</b>	<b>Which language is most frequently spoken?</b>
8AM – 11AM	English, Spanish, or both languages equally
12PM – 2PM	English, Spanish, or both languages equally
3PM – 7PM	English, Spanish, or both languages equally

Suggested abbreviated time frames and questions based on factor analysis with 3 time-interval factors

# Conclusion

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**This initial analysis provides evidence that there may be potential to condense the hourly diary approach resulting in a more time efficient method of collecting similarly valuable linguistic information.**

# Future Directions

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- ❑ Examine the correlation between the results of the administration of the full-length BIOS-Home, which includes all time frames, and a condensed version, consisting of the three time frames
- ❑ Sample of children administered the full-length BIOS-Home and the condensed survey at two discrete points in time
- ❑ A correlation analysis can determine if the results from the two versions of the survey are similar
- ❑ Even simpler formats (e.g., parent questionnaire or recorded proctoring) for increased time efficiency

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# Thank you!

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