



INTRODUCTION

- Luk & Bialystok (2013): **Bi-/Multilingualism is a multidimensional construct** that involves many factors and thus cannot be treated as a categorical variable
- ! Major problem in the field: **variation in multilingual population is often oversimplified** or simply ignored
- **Linguistic diversity** is unavoidable when multiple languages exist and interact
- Bice & Kroll (2019): monolinguals in a diverse linguistic context showed **distinct brain activations** from monolinguals in a unilingual context
- Tsimpli et al. (2020): sociolinguistic diversity can enhance cognitive performance for disadvantaged school children

RESEARCH QUESTIONS

- 1) Is there a variation in sociolinguistic diversity context within a multilingual population?
- 2) Is sociolinguistic diversity associated with executive functions?

METHODS & MATERIALS

PARTICIPANTS

- 127 healthy adults from Malaysia
- 86% self-rated as multilingual, 13% bilingual, 1% monolingual
 - 23 languages and dialects reported
 - 51% reported English as their most proficient language, 39% Mandarin Chinese

PROCEDURE

Online experiment via Gorilla:

- **Contextual Linguistic Profile Questionnaire** (CLiP-Q, Wigdorowitz et al., 2020) - includes CILD (contextual and individual linguistic diversity) measure for sociolinguistic diversity
- **Flanker task** (inhibitory control)
- **Set-shifting task** (colour-shape task switch)
- **2-back task** (updating skills and working memory)

DATA ANALYSIS

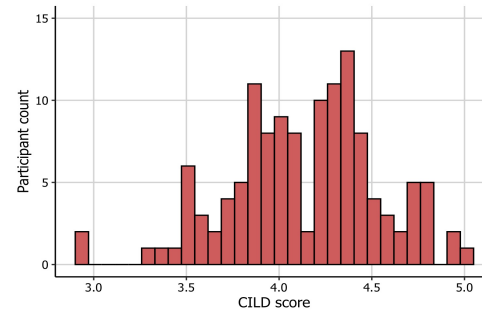
Multiple linear regression models

- IV: CILD score, SES, age
- DV: Flanker – interference effect (accuracy and reaction times)
Set-shifting – mixing cost and shifting cost (accuracy and reaction times)
N-back – A-prime score (accuracy/hit rate and false alarm rate)

RESULTS

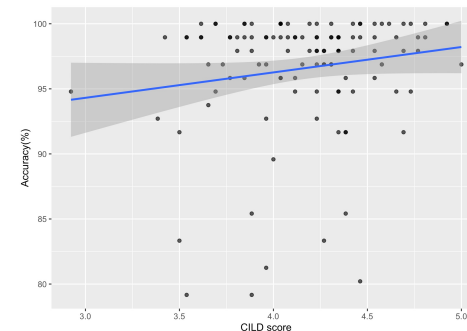
SOCIOLINGUISTIC DIVERSITY CONTEXT

- Mean CILD score = 4.14 (SD = 0.40)
- Relatively high sociolinguistic diversity context in Malaysia (compared to 3.86 for South Africa and 2.59 for the UK; Wigdorowitz et al., 2020)
- The population varied in CILD scores, although almost all of them were bi/multilinguals
- Multilingual experience is not homogeneous



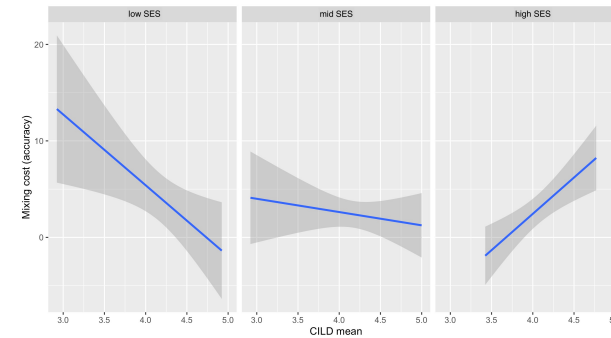
FLANKER TASK

- Marginally significant effect of CILD ($\beta = 0.17$, $p = 0.069$) for overall task accuracy
- Significant negative correlation ($B = -15.15$, $p < 0.05$) between CILD and interference effect



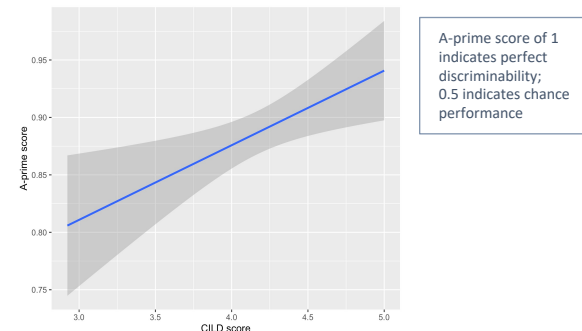
SET-SHIFTING TASK

- No significant effects for switching costs, only significant effects for mixing costs
- Main effect of CILD ($\beta = -0.16$, $p < 0.05$), SES ($\beta = -0.09$, $p < 0.05$), and significant interaction between CILD and SES ($\beta = 0.18$, $p < 0.05$)
- Low SES group: significant negative correlation between CILD and mixing cost ($\beta = -0.43$, $p < 0.05$)
- High SES group: significant positive correlation between CILD and mixing cost ($\beta = 0.75$, $p < 0.01$)



N-BACK TASK

- Main effect of CILD ($\beta = 0.25$, $p < 0.01$) for A-prime score



CONCLUSIONS

- **Sociolinguistic diversity improved cognitive performance** in the Flanker and 2-back tasks, reflecting exceptional interference suppression and updating skills
- **Low SES participants** who are typically disadvantaged in cognitive control also **benefited from a more diverse linguistic context** displayed by reduced mixing cost and better accuracy in the set-shifting task
- According to Miyake & Friedman (2012)'s model: **linguistic diversity advantage** for inhibitory control and common EF, and updating-specific ability
- Being exposed to diverse languages across social contexts requires the **need to inhibit non-target language information** and **maintain different linguistic representations in memory**

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