



# Cognitive diversity and the practice of bilingualism:

Some methodological concerns and a theoretical proposal

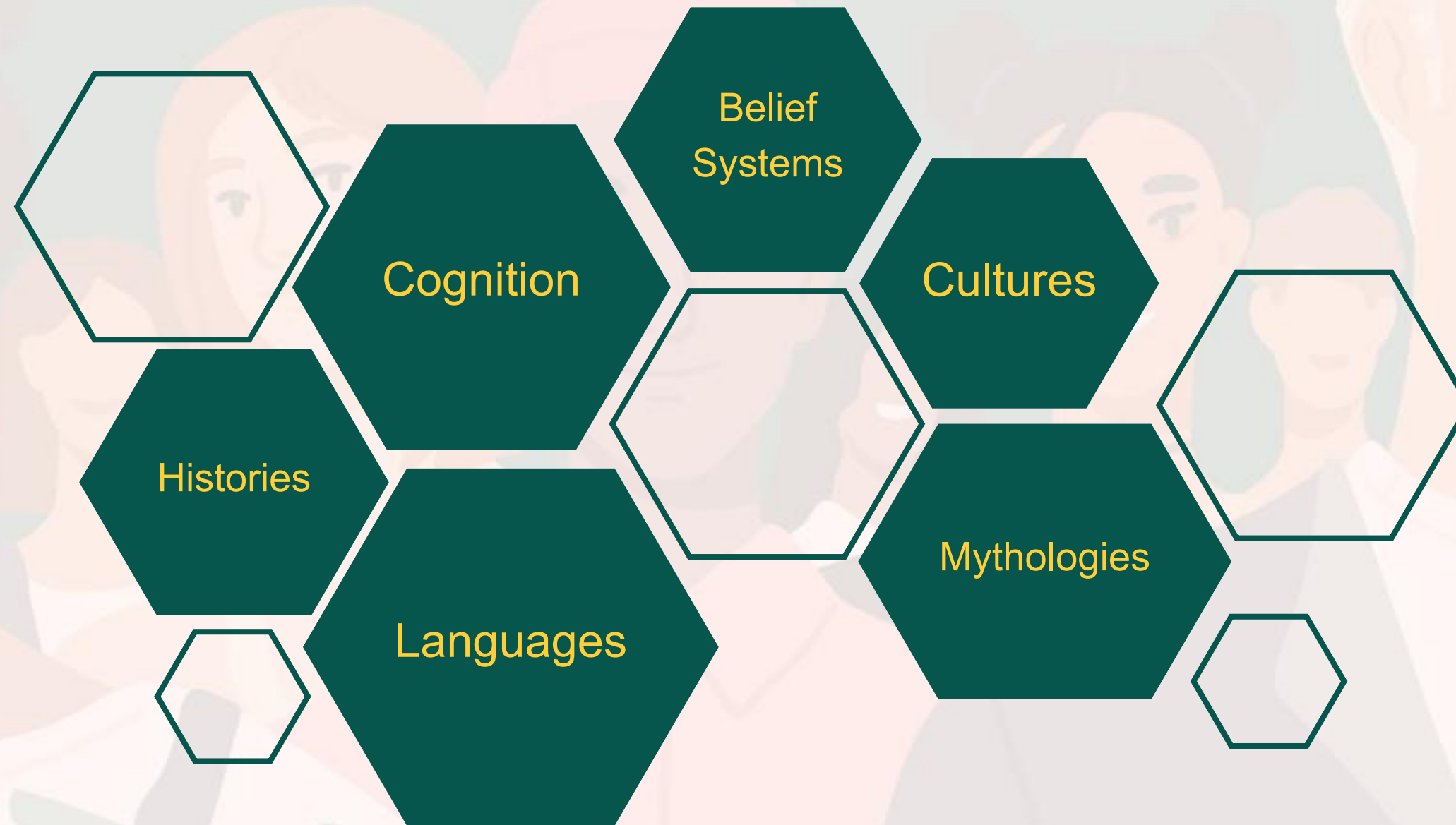
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# What is Diversity?

- Adaptive Evolutionary Culture Specific Strategy



# Assumptions in the field

- Diversity is studying too many people of different types
- Cross-cultural/linguistic comparisons for theory building



WESTERN

INDUSTRIALIZED

DEMOCRACIES

EDUCATED

RICH



# Linguistic Diversity vs Cognitive Diversity



*I saw a Cat !*

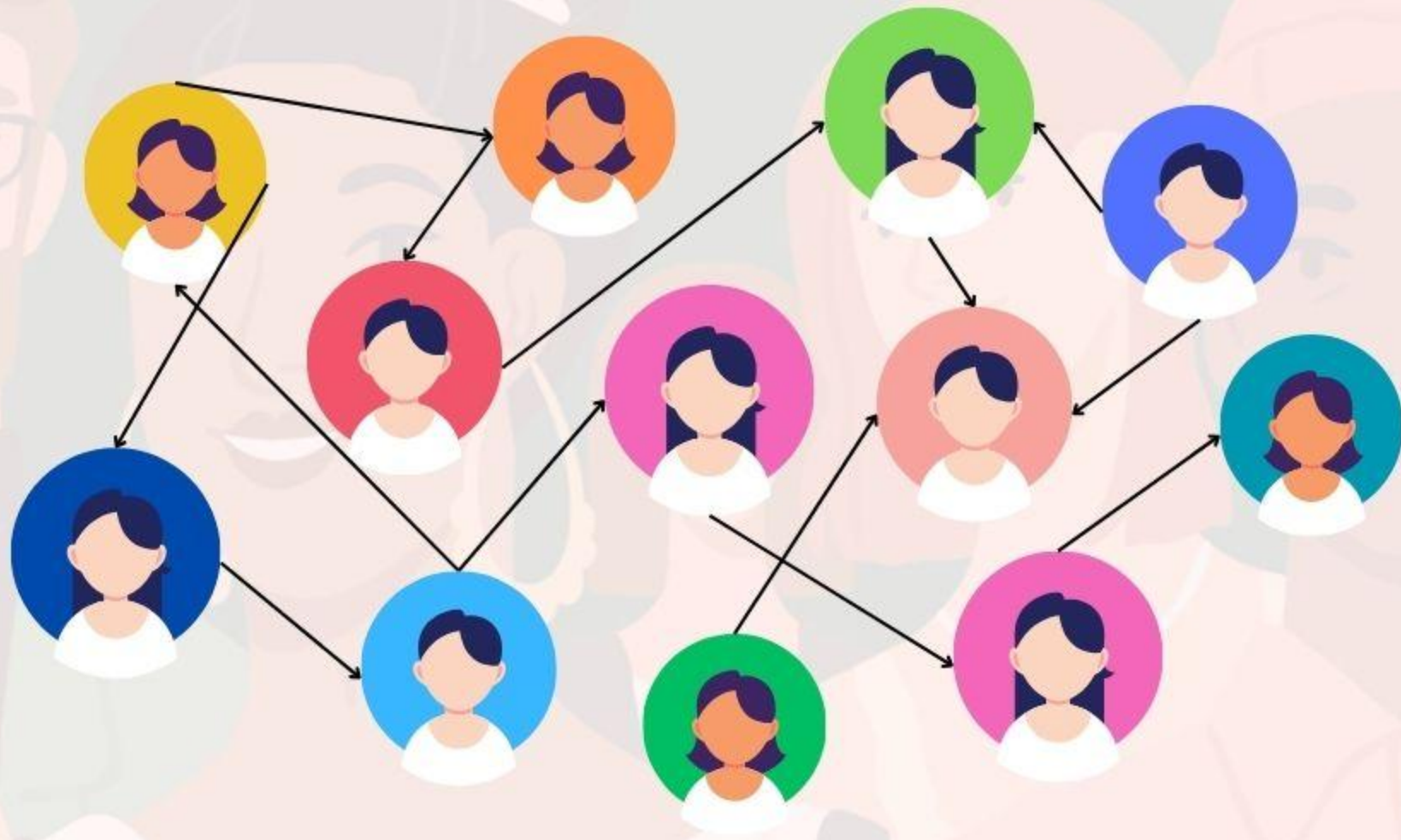


मैंने एक बिल्ली  
देखी !

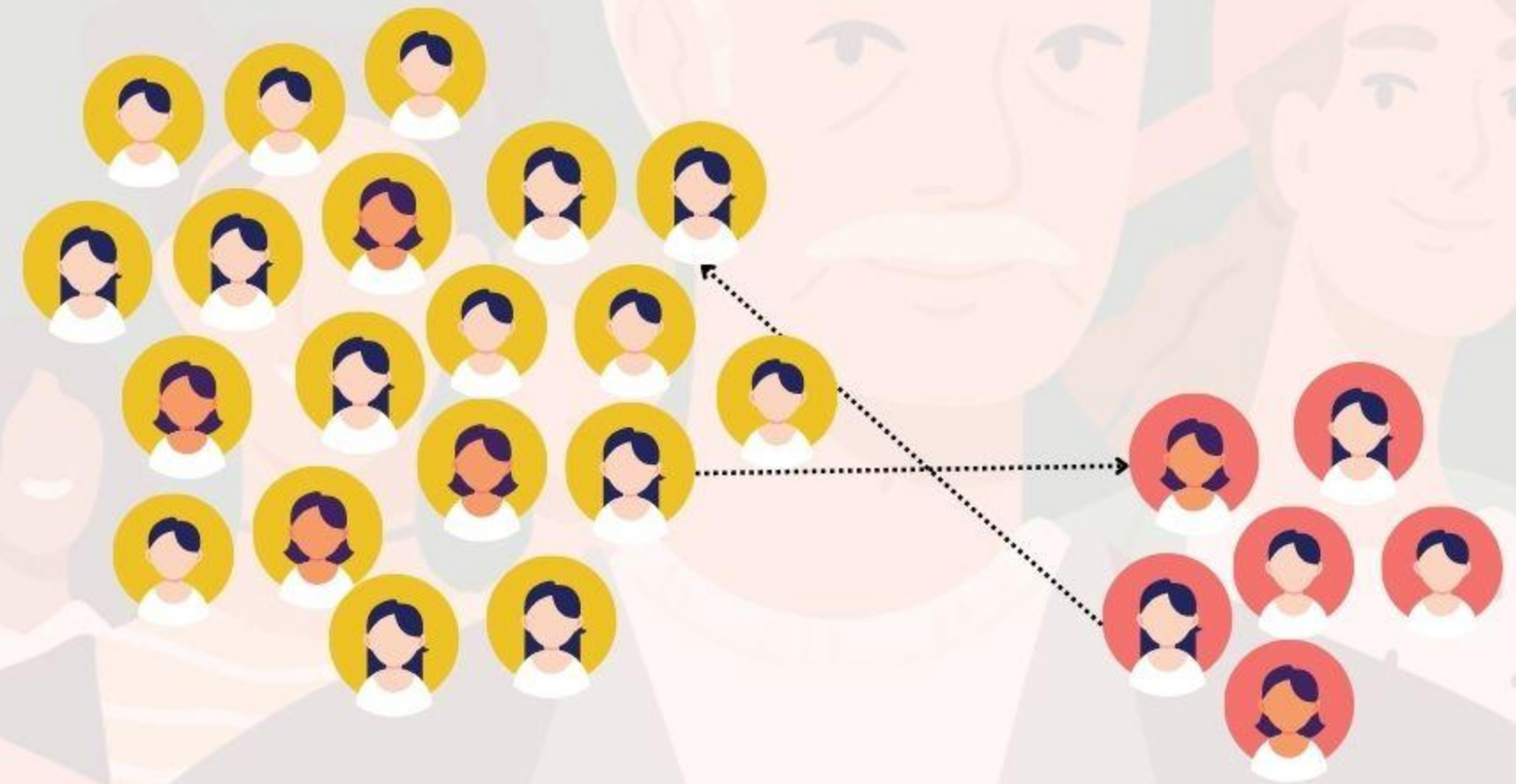


# Two Types of Diversity

Broadly Diverse Context (BDC)

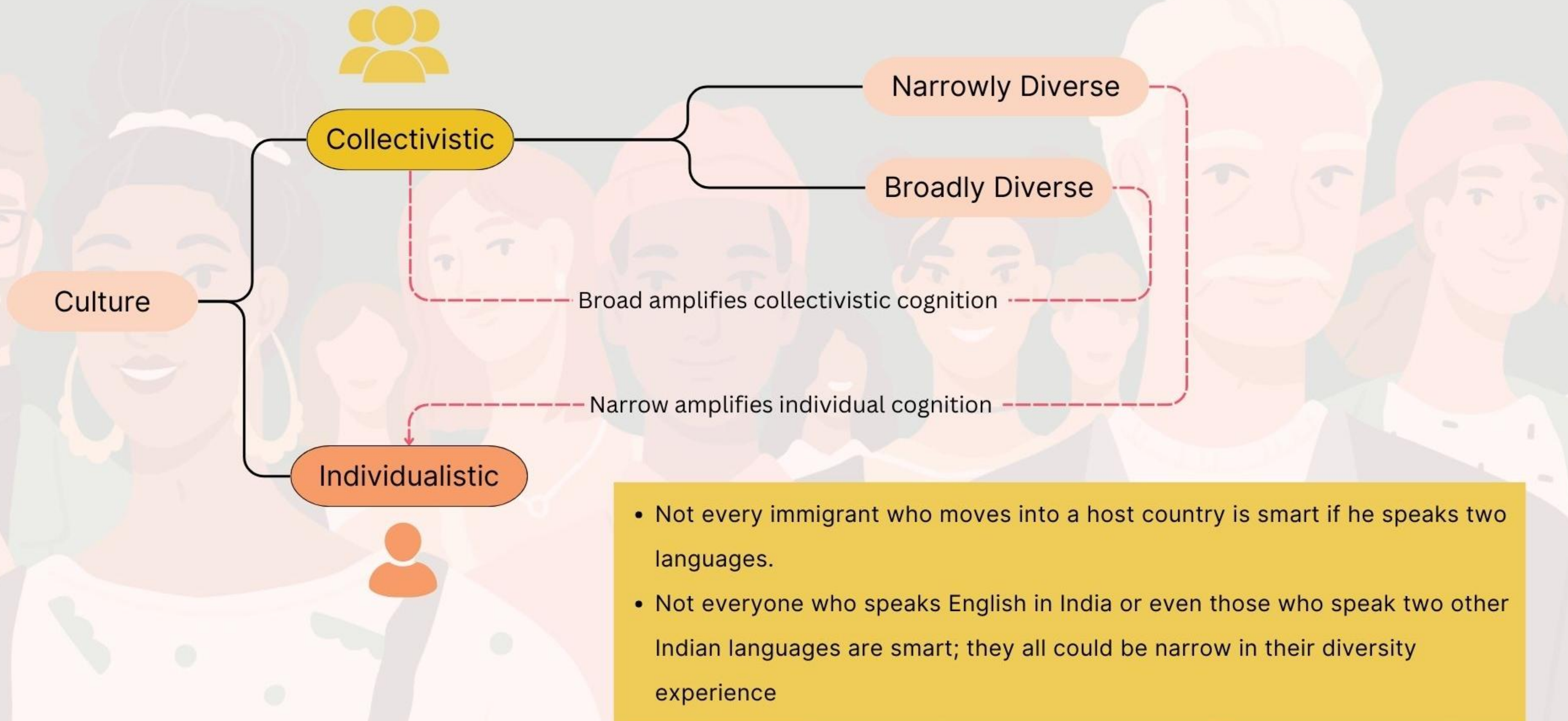


Narrowly Diverse Context (NDC)





# Types of Cultures and Diversities





# The Diversity Continuum

Narrow

Broad

## Cognitive Factors

- Low flexibility
- High Reactive Control
- Traditionally discriminatory of context
- Cognitive strategy: *Computational*

## Linguistic Factors

- Limited dialects
- Limited scope for mother tongue practice.
- Enforced official language.

## Cognitive Factors

- High flexibility
- Lesser inhibitory control
- Evolutionary need to accomodate
- Cognitive Strategy: *Affective*

## Linguistic Factors

- Multiple languages and communicative habits.
- Different ages of L2 acquisitions

Going from Narrow to Broad

Going from Broad to Narrow



# English Language Creates Broad and Narrow Diversity in India

- Social dominance of one language - English
- Social stratification of speaking habits, choice of interlocutors
- Cultural eliticism and alienation



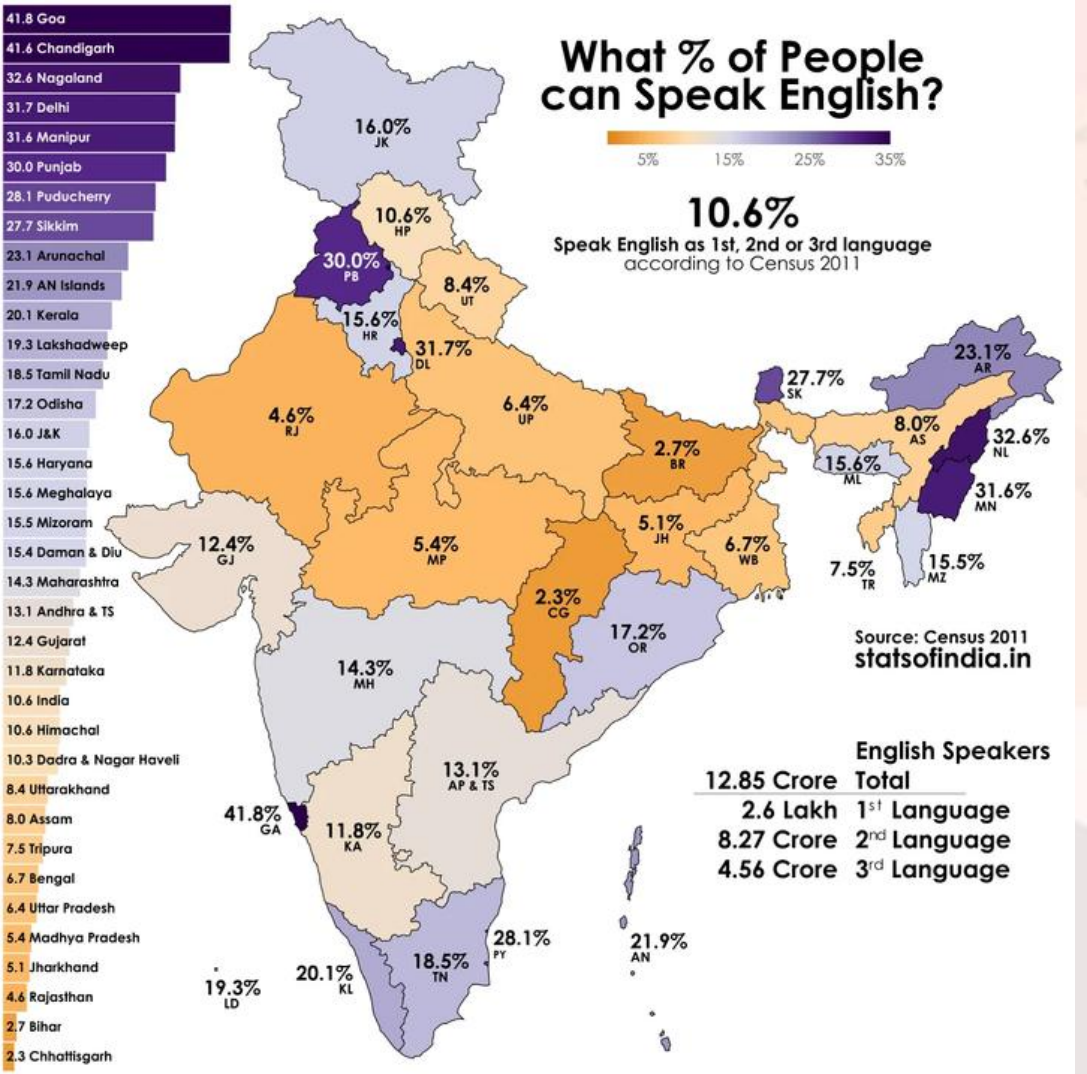
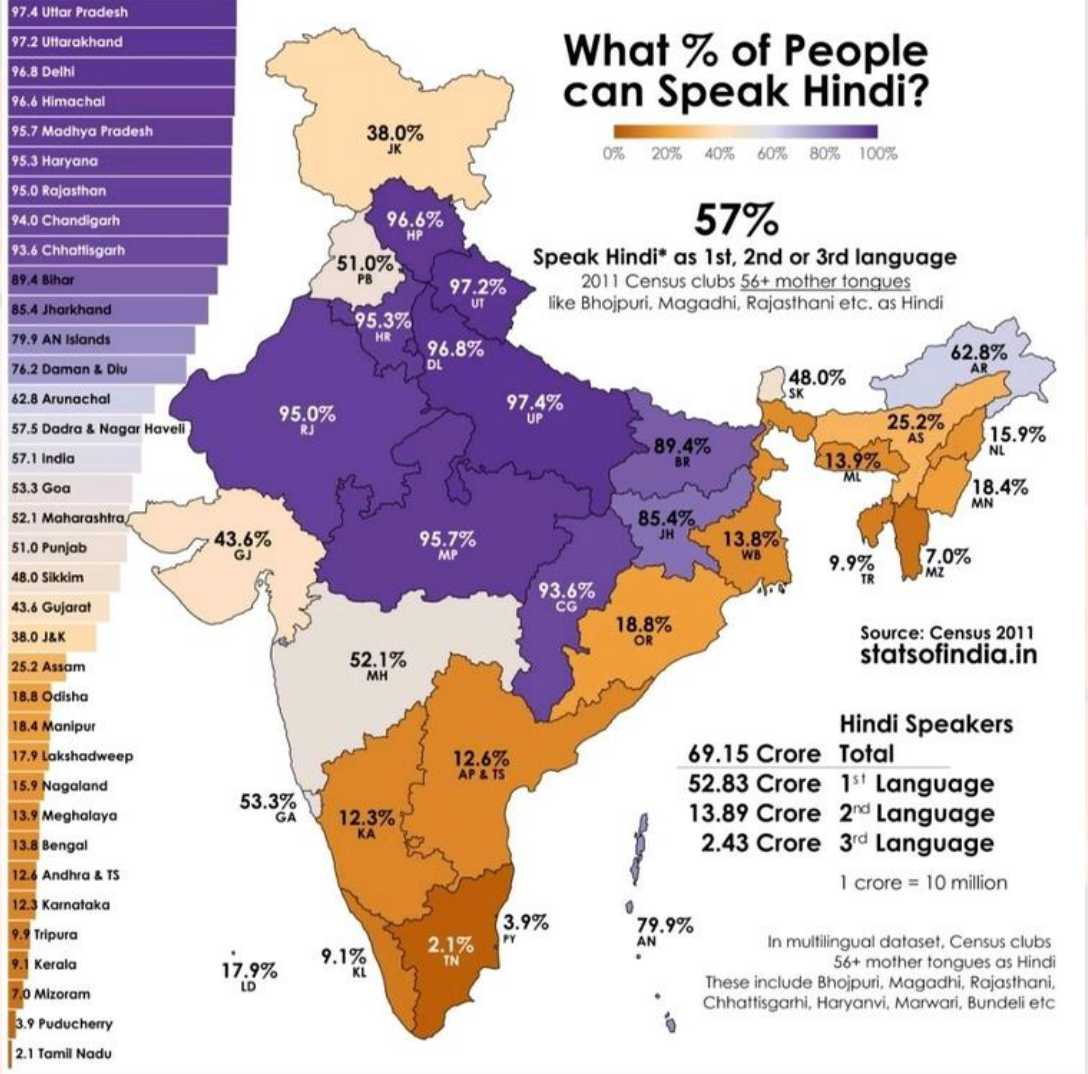
An international School in India



A Central Govt. School in India



# Hindi vs English in India





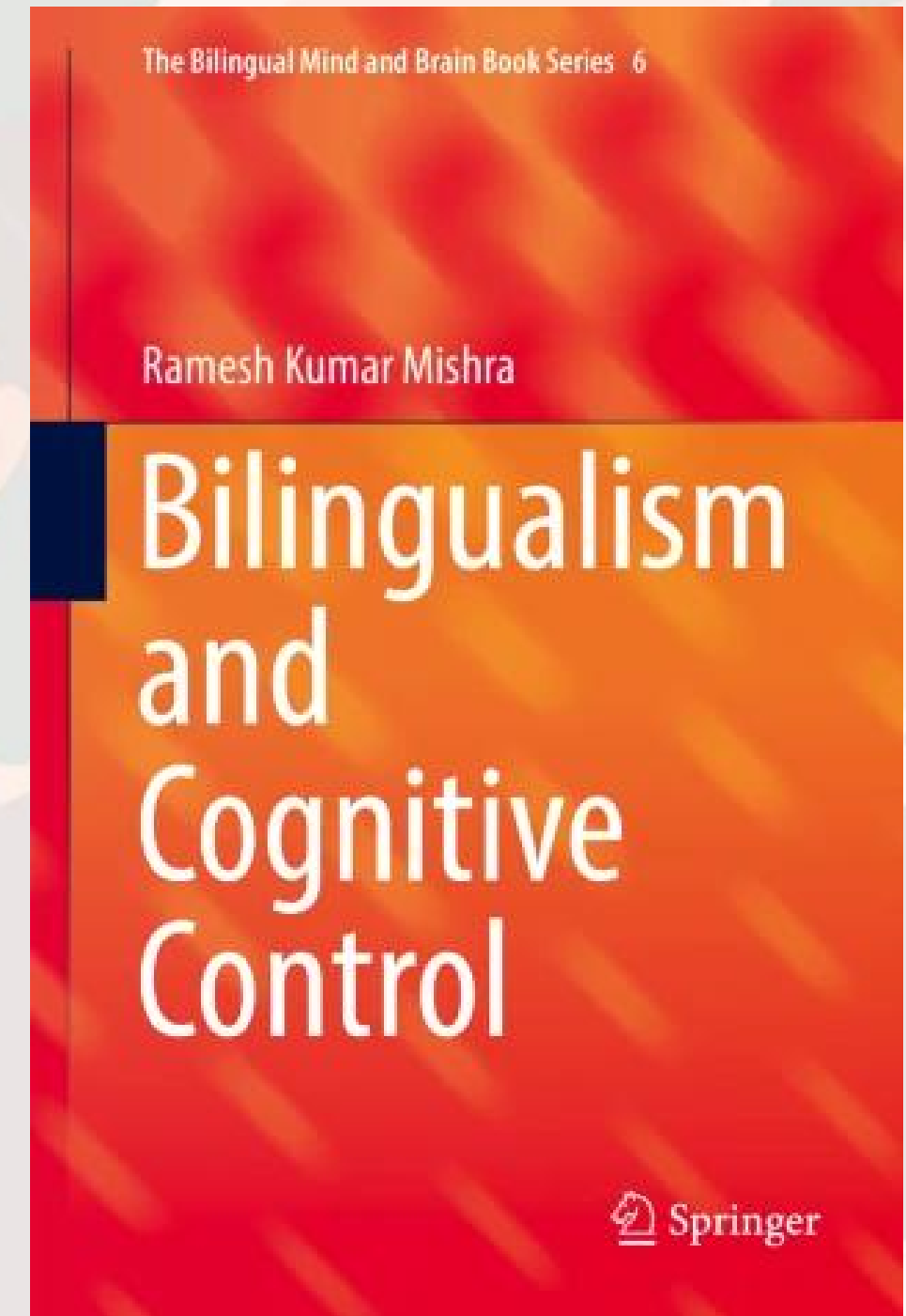
A stylized illustration of a diverse group of people of various ages and ethnicities. In the foreground, a woman with dark skin and hair in a bun with a white headband and large gold hoop earrings is on the left, wearing a white top with green polka dots. Next to her is a woman with light skin and reddish hair. In the center is a man with dark skin wearing a pink shirt. To his right is a woman with dark skin and hair in buns. On the far right is an older man with white hair and a mustache, wearing a grey suit jacket over a white shirt. Behind him is a man with light skin wearing a pink baseball cap. The background is a solid light green color.

# Bilingualism, Cognition and Diversity



# The Evolution of Bilingualism is Because of Human Cognitive Diversity

Bilingualism evolved as an evolutionary adaptation to know other minds and nuances of cultures via languages (Mishra 2018).





# The Bilingual's Mind

A faint, stylized illustration of a diverse group of people of various ages and ethnicities serves as the background for the slide.

Language Non-Selective  
Activation

Enhanced Cognitive  
Reserve

Domain General  
Cognitive Advantage



# Problems with Current Approaches/Models

- Bilingual mind is viewed as a computational system managing two languages.
- Insulated from historical, social and cultural influences

## Why accommodate everyday bilingual experience ?

Everyday bilingual experience influences cognition

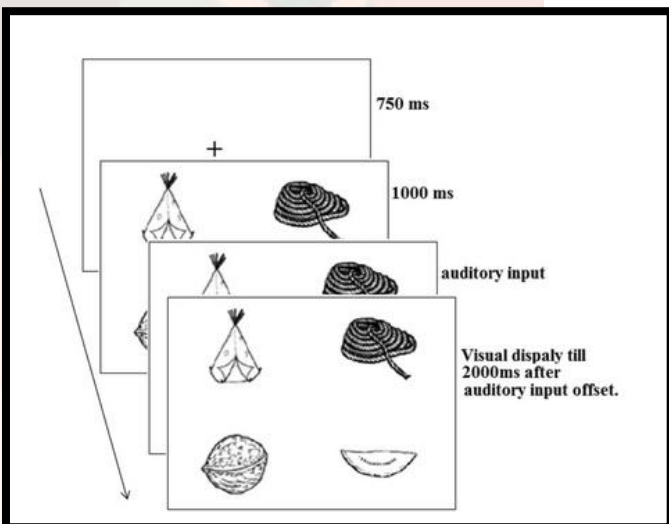
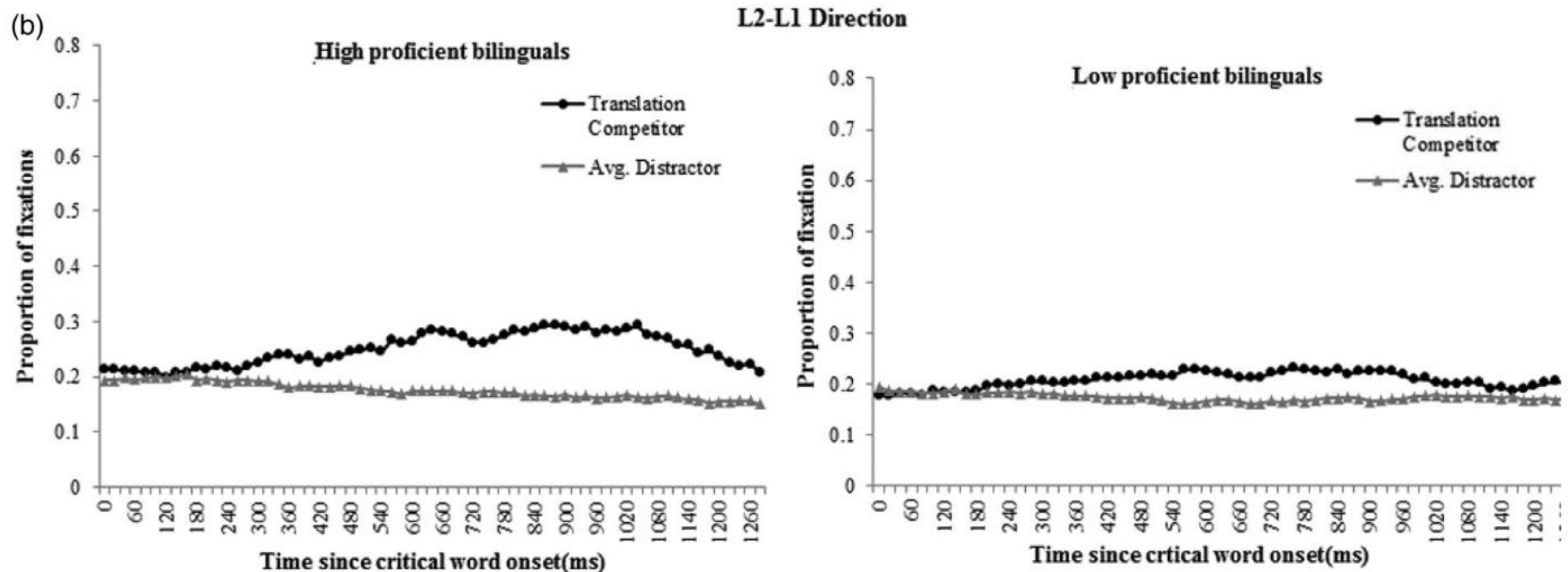
- Entropy Measures
- Social Networks
- Culture-Specific Effects

# Empirical Predictions of Narrow and Broad Diversity in the Context of Bilingualism

- Diversity type will influence cross-linguistic activation
- Diversity type will influence cognitive control strategies
- Diversity type will influence interlocutor adaptation and cognitive adaptations

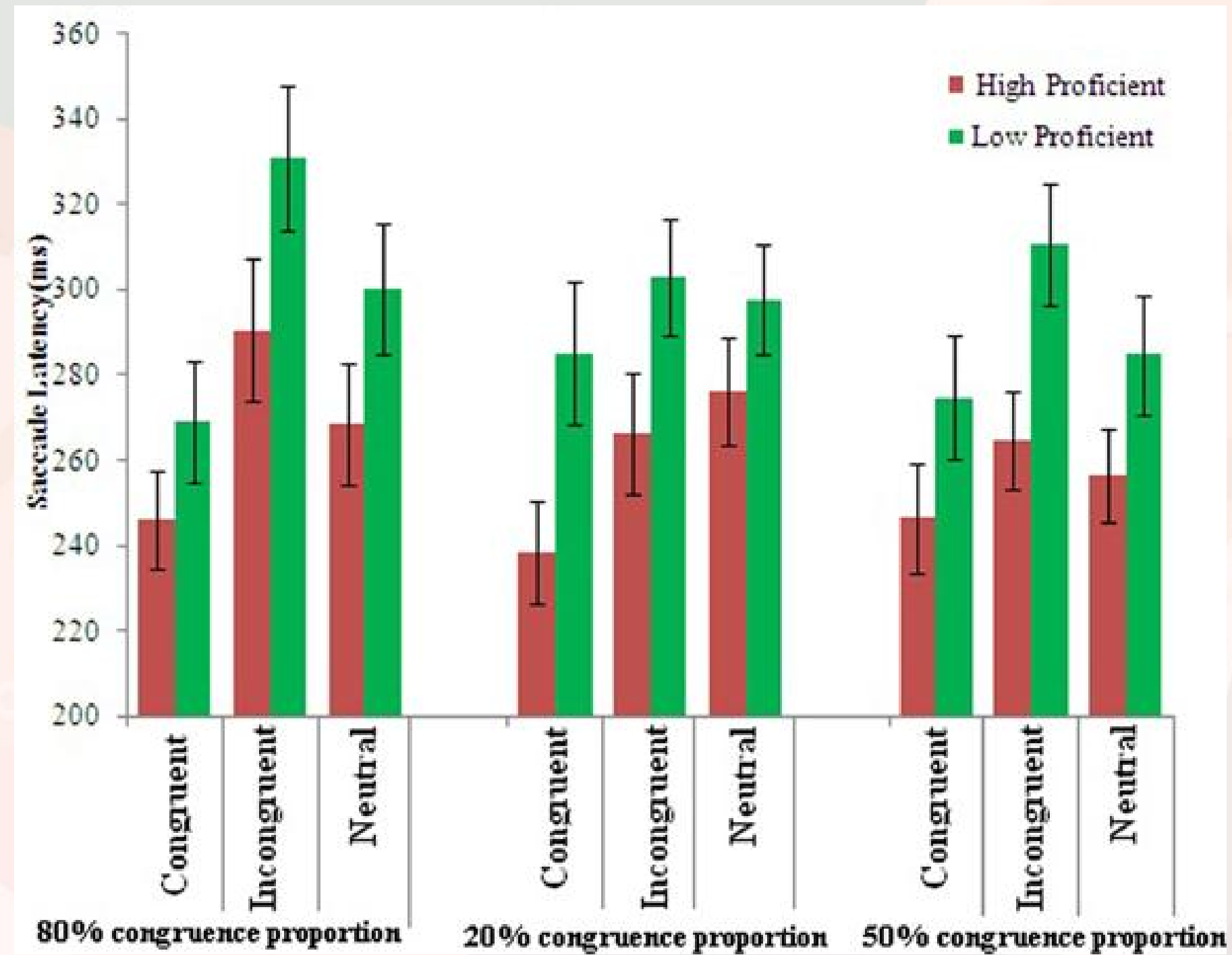
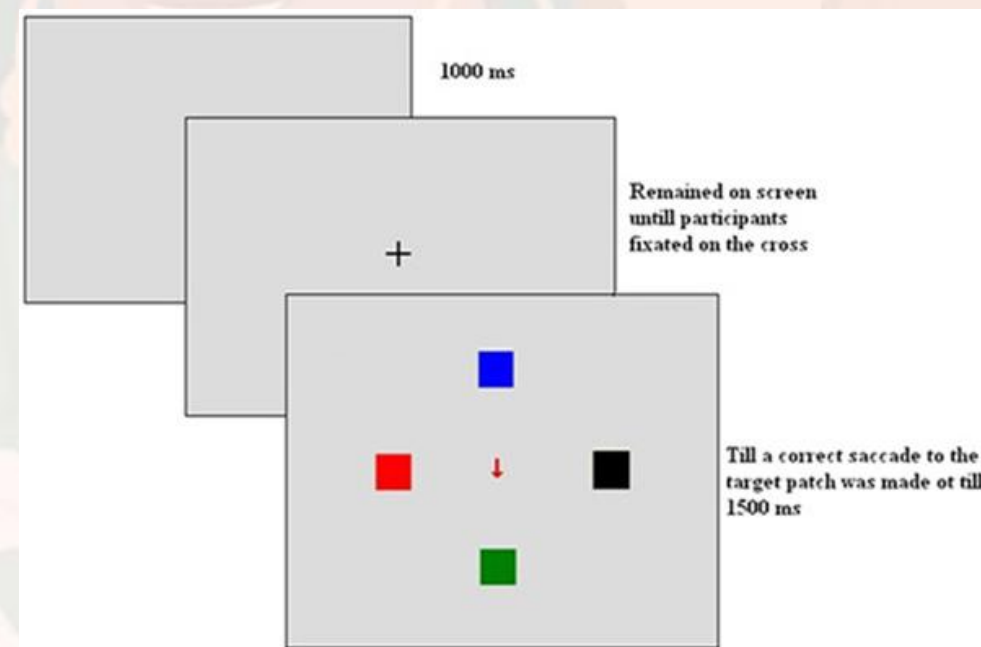


Both high and low proficient Hindi-English bilinguals activated translation equivalents spontaneously. Activations were higher in L2-L1 than in L1-L2 directions.



Mishra, R. K., & Singh, N. (2016). The influence of second language proficiency on bilingual parallel language activation in Hindi-English bilinguals. *Journal of Cognitive Psychology*, 28(4), 396-411.

High-proficient bilinguals were overall faster on all types of trials in all monitoring blocks in general and there was a specific conflict advantage in the high monitoring condition.

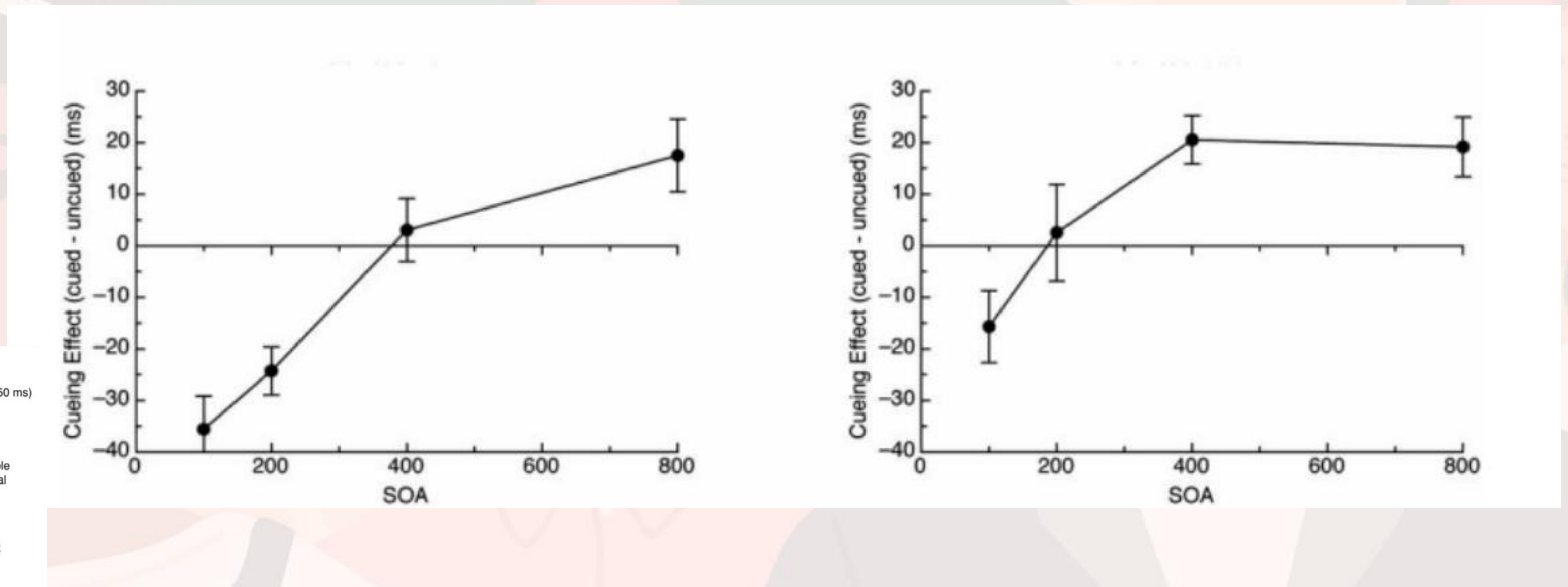


Singh, N., & Mishra, R. K. (2013). Second language proficiency modulates conflict-monitoring in an oculomotor Stroop task: Evidence from Hindi-English bilinguals. *Frontiers in psychology*, 4, 322.



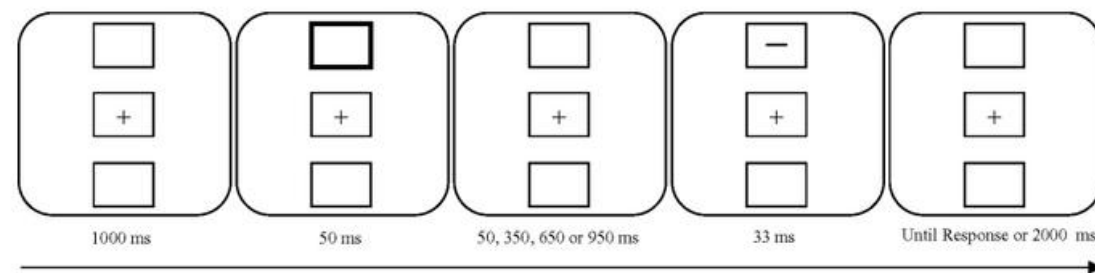
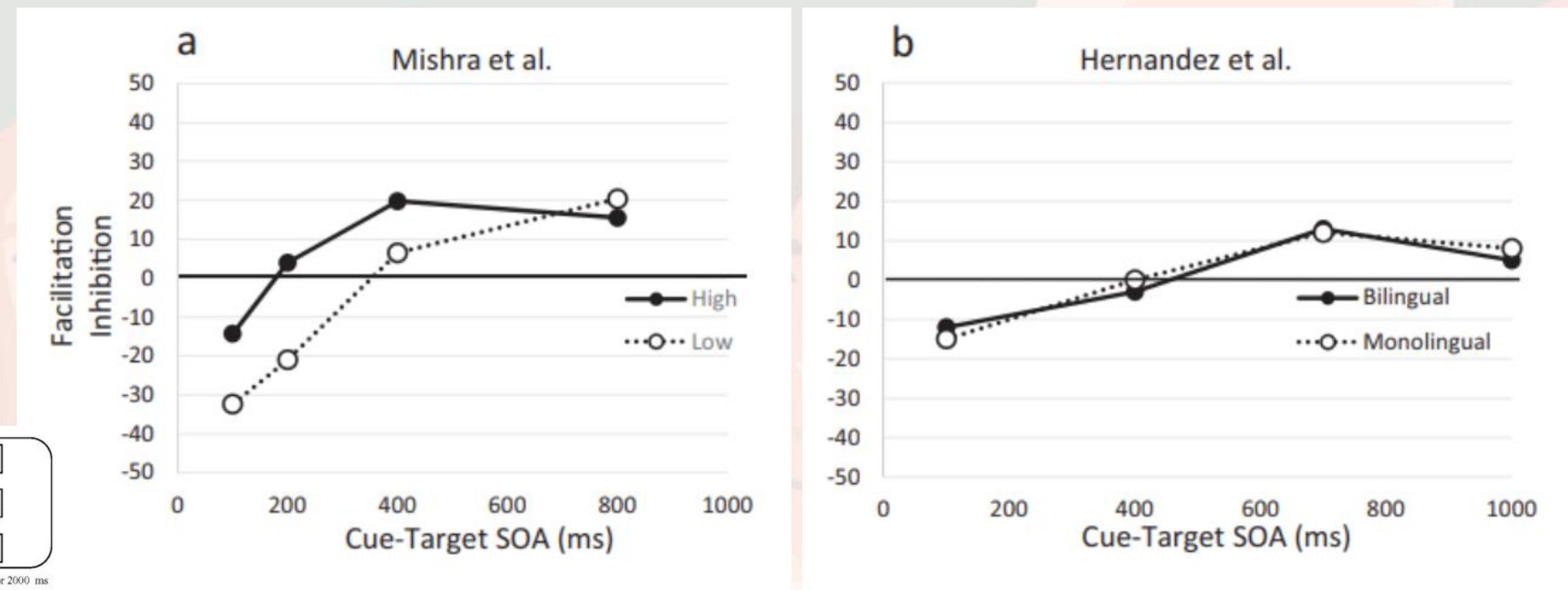
# High L2 proficient Hindi-English bilinguals of Allahabad, India (Mishra et al., 2012) were quick to disengage their attention.

High-proficient bilinguals demonstrate enhanced attention to task goals as compared to low-proficient bilinguals



Mishra, R. K., Hilchey, M. D., Singh, N., & Klein, R. M. (2012). On the time course of exogenous cueing effects in bilinguals: Higher proficiency in a second language is associated with more rapid endogenous disengagement. *Quarterly Journal of Experimental Psychology*, 65(8), 1502-1510.

Spanish-Catalan bilinguals did not show such a difference in pattern of exogenous cueing effect on an IOR task

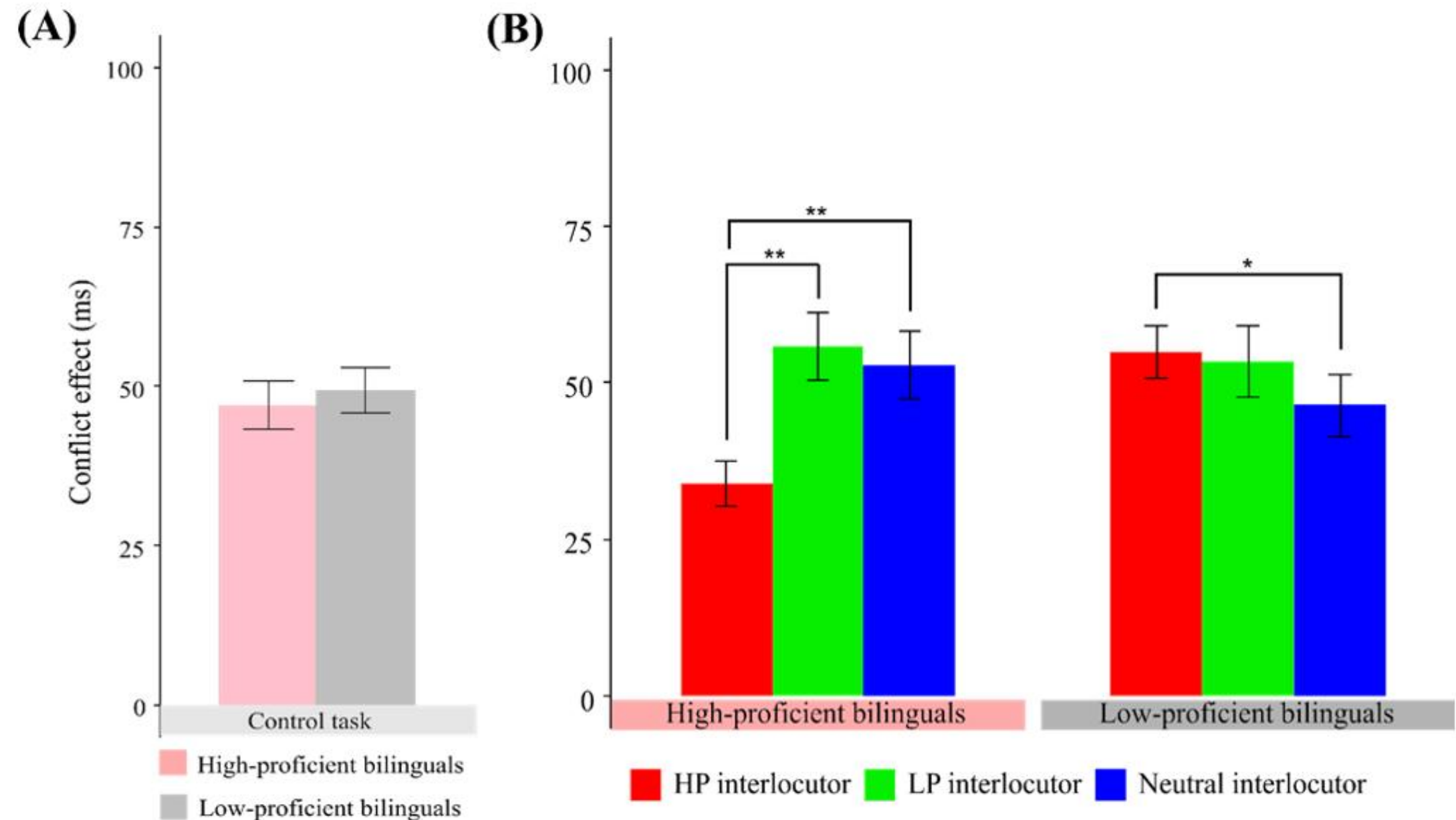
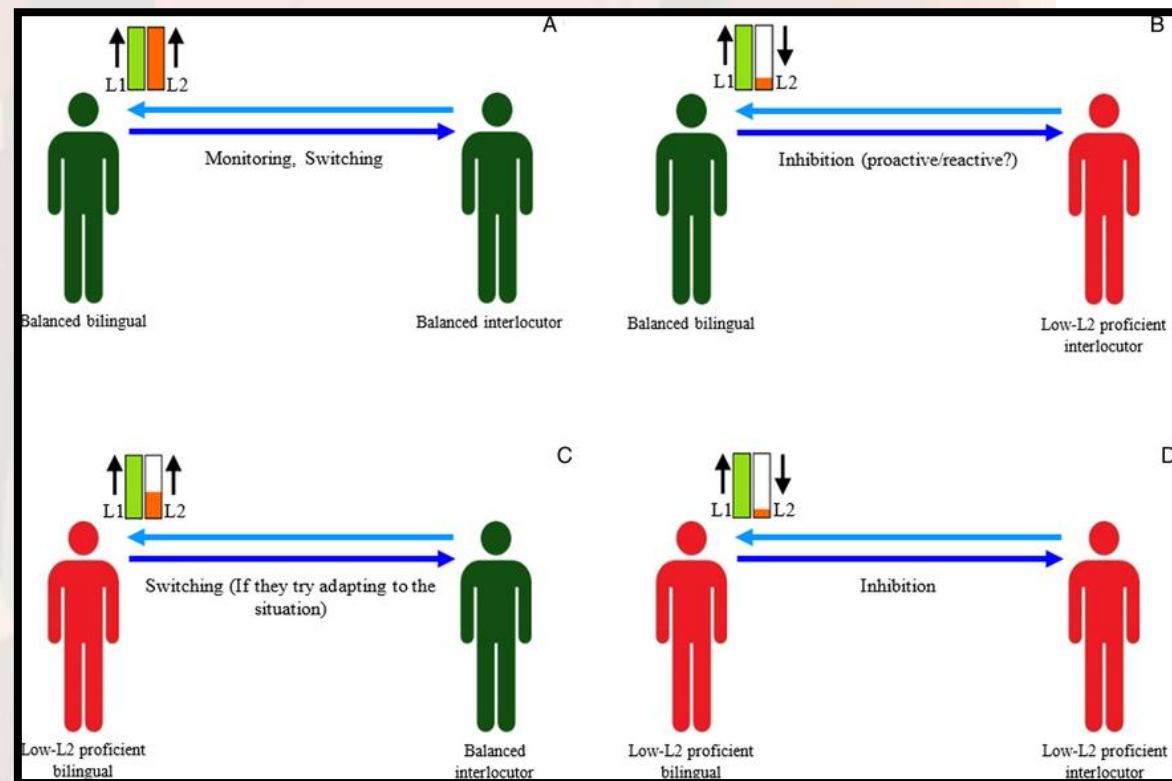


a. High L2 proficient Hindi-English bilinguals of Allahabad, India (Mishra et al., 2012) were quick to disengage their attention. b. No difference between (Spanish - Catalan) bilinguals and monolinguals (Spanish) of Spain (Hernandez et.al.,(2010).

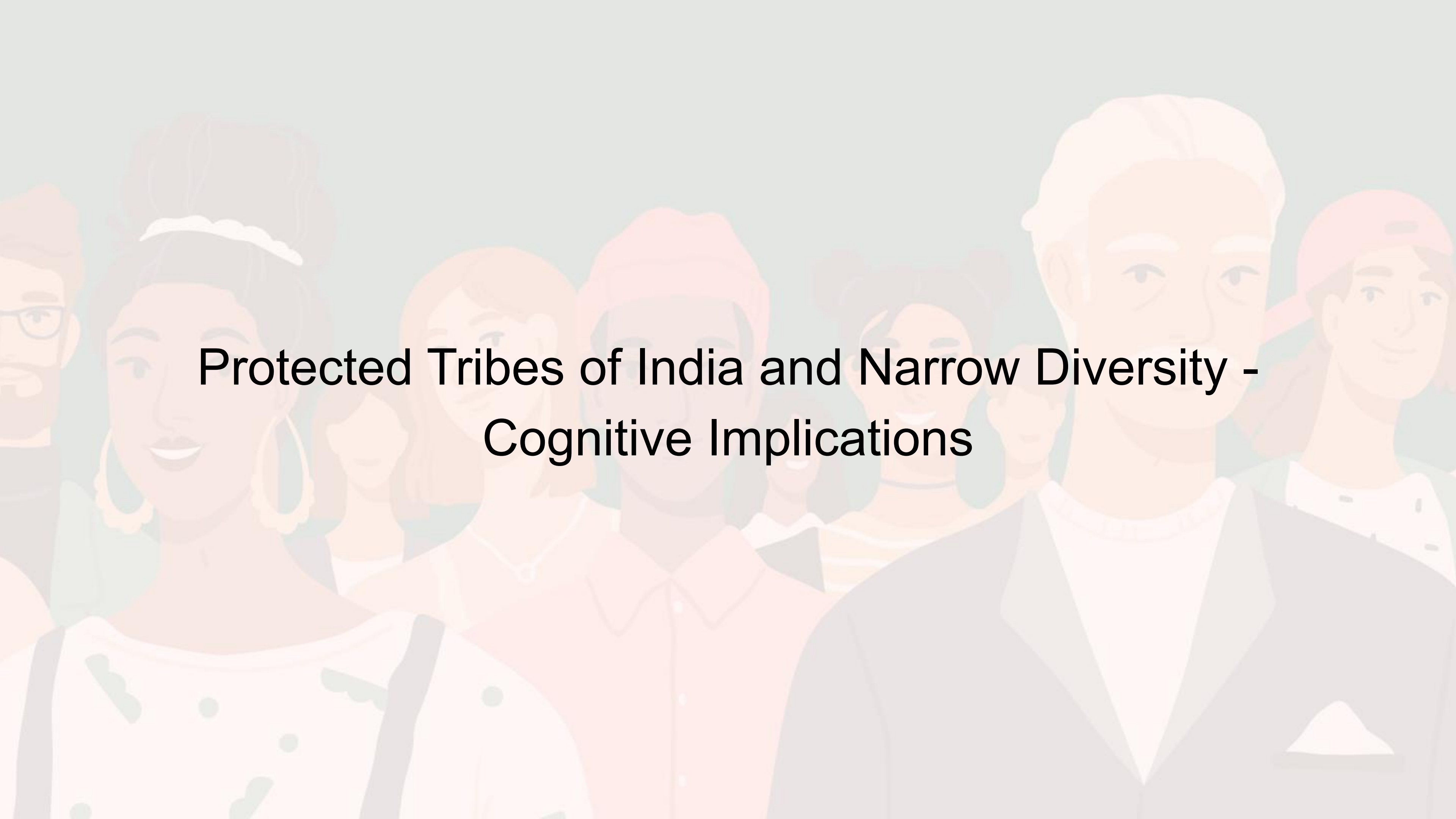
Hernández, M., Costa, A., Fuentes, L. J., Vivas, A. B., & Sebastián-Gallés, N. (2010). The impact of bilingualism on the executive control and orienting networks of attention. *Bilingualism: Language and Cognition*, 13(3), 315-325.



High-L2 proficient and Low-L2 proficient bilinguals activated different control mechanisms in the presence of different interlocutors. High-L2 proficient bilinguals had faster RTs and smaller conflict effect in the presence of High-L2 proficient interlocutors.



Rafeekh, R., & Mishra, R. K. (2020). The sensitivity to context modulates executive control: Evidence from Malayalam–English bilinguals. *Bilingualism: Language and cognition*, 24(2), 358-373.

A stylized illustration of a diverse group of people, including men and women of various ethnicities and ages, smiling and looking forward. The illustration is rendered in a soft, painterly style with muted colors. The text is overlaid on the center of the image.

# Protected Tribes of India and Narrow Diversity - Cognitive Implications



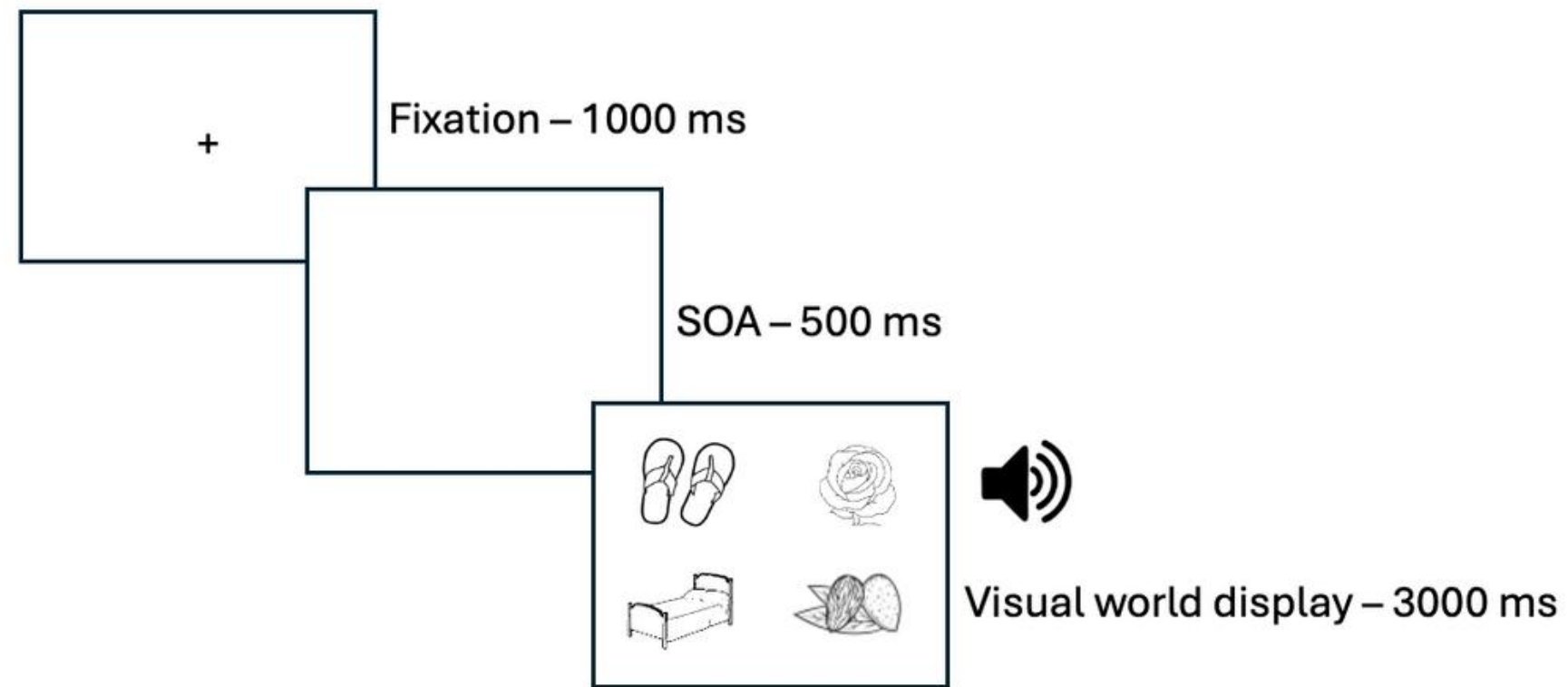
# The Kota Tribe

- A minority community apprx 1,500-2,000 people in the Nilgiri hills of Tamil Nadu.
- Languages spoken "Kota", a 'critically endangered' language due to the greater social status of neighbouring languages.
- Other languages spoken in the region: Toda, Irula, Kurumba and Badaga.





# Visual World Experiment: Cross-linguistic activation between Tamil and Kota

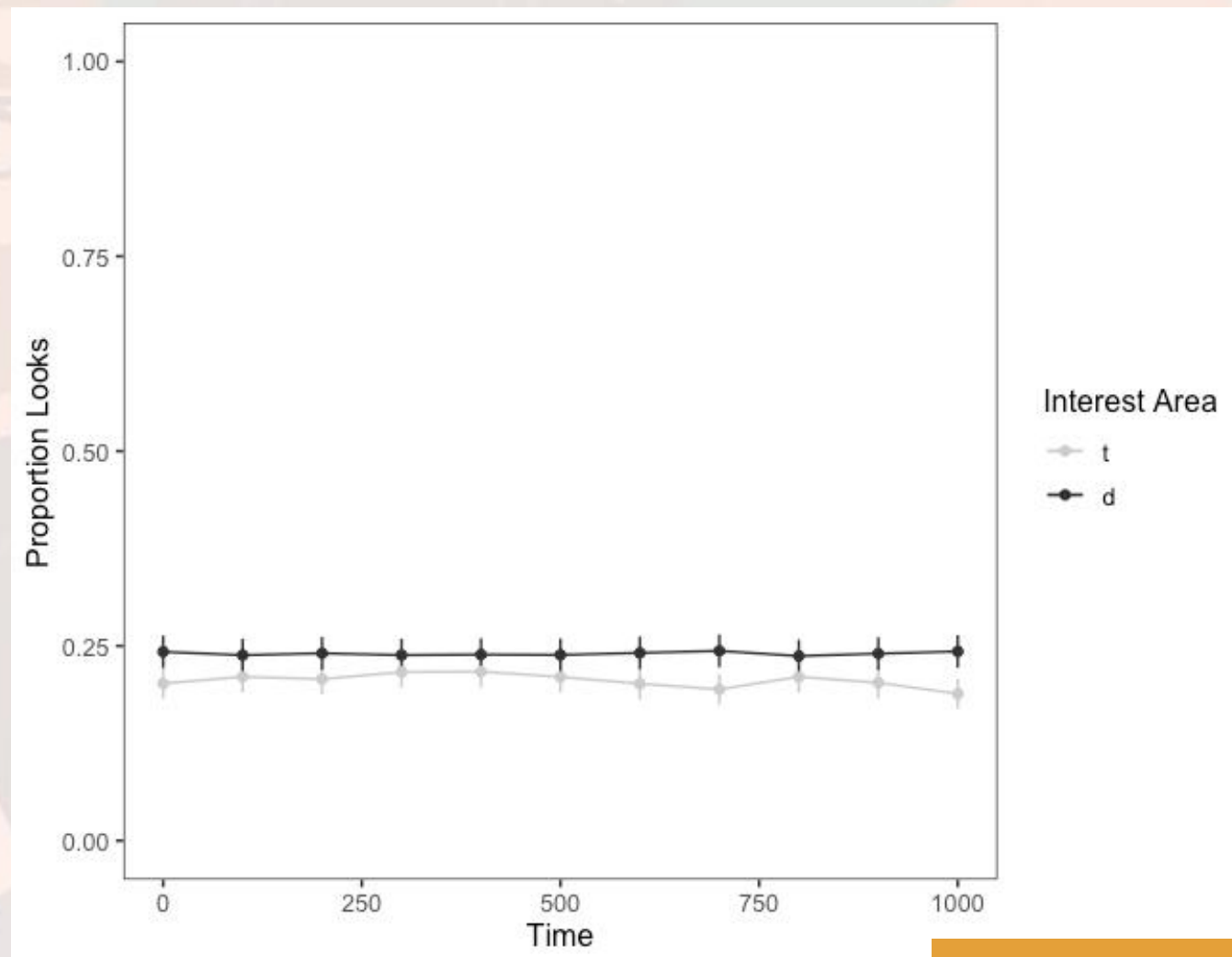


Example Trial: (L2 - L1 language direction) Spoken word in Tamil (L2) Minnal (lightening); Phonological cohort (cross linguistic) in Kota (L1) Mittai (sweet)

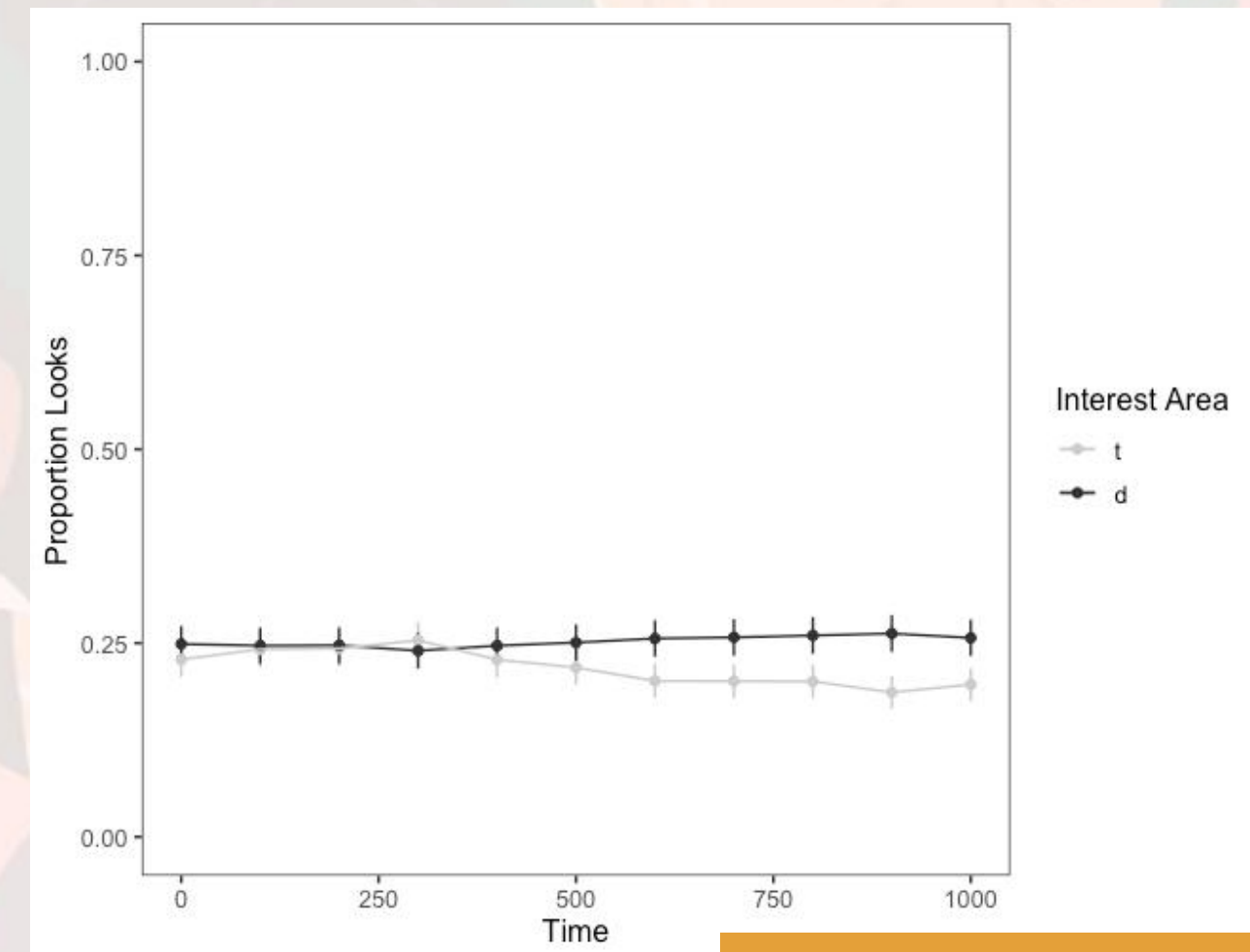


# No activation of phonological cohort in both Kota (L1) and Tamil (L2) language directions in the Kota tribes of TamilNadu

N=20 women of the Kota tribe in the Nilgiri Hills of Ooty, India



Spoken word Kota (L1- L2)

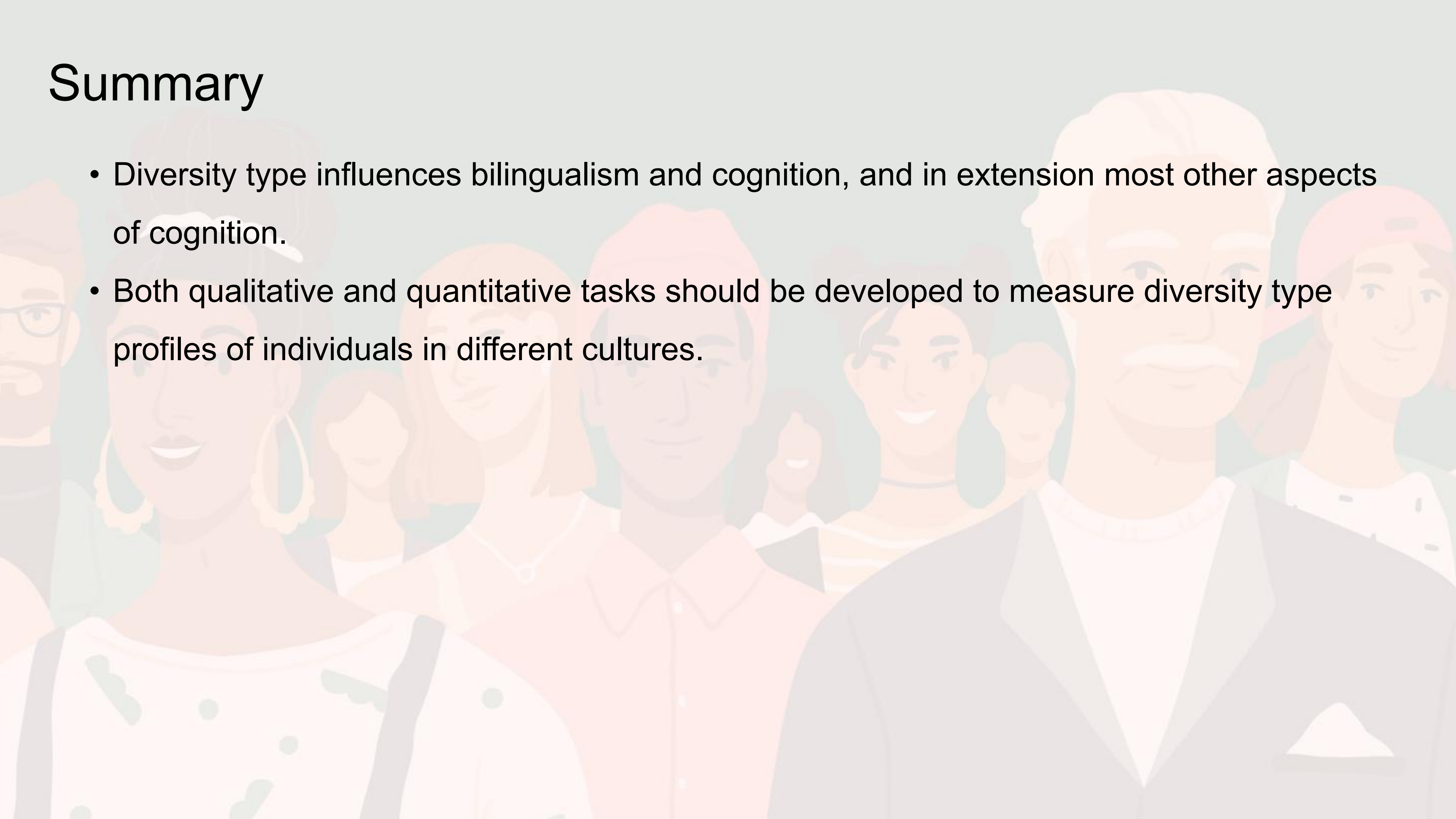


Spoken word Tamil (L2 - L1)

Activation of phonological cohort was absent in both the language directions

# Summary

- Diversity type influences bilingualism and cognition, and in extension most other aspects of cognition.
- Both qualitative and quantitative tasks should be developed to measure diversity type profiles of individuals in different cultures.





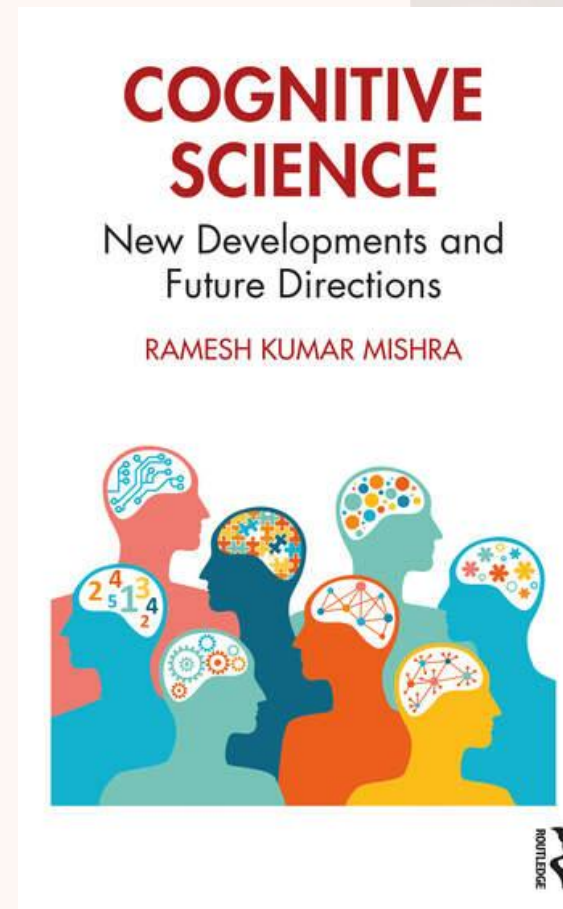
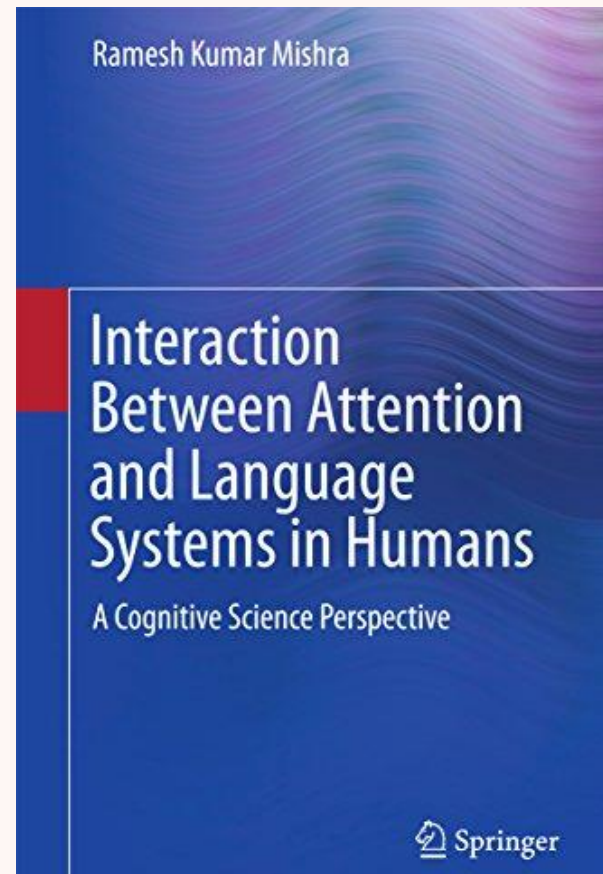
# Thank You!

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