Toward a non-linguistic measure of auditory processing deficits in older and younger monolingual and bilingual adults

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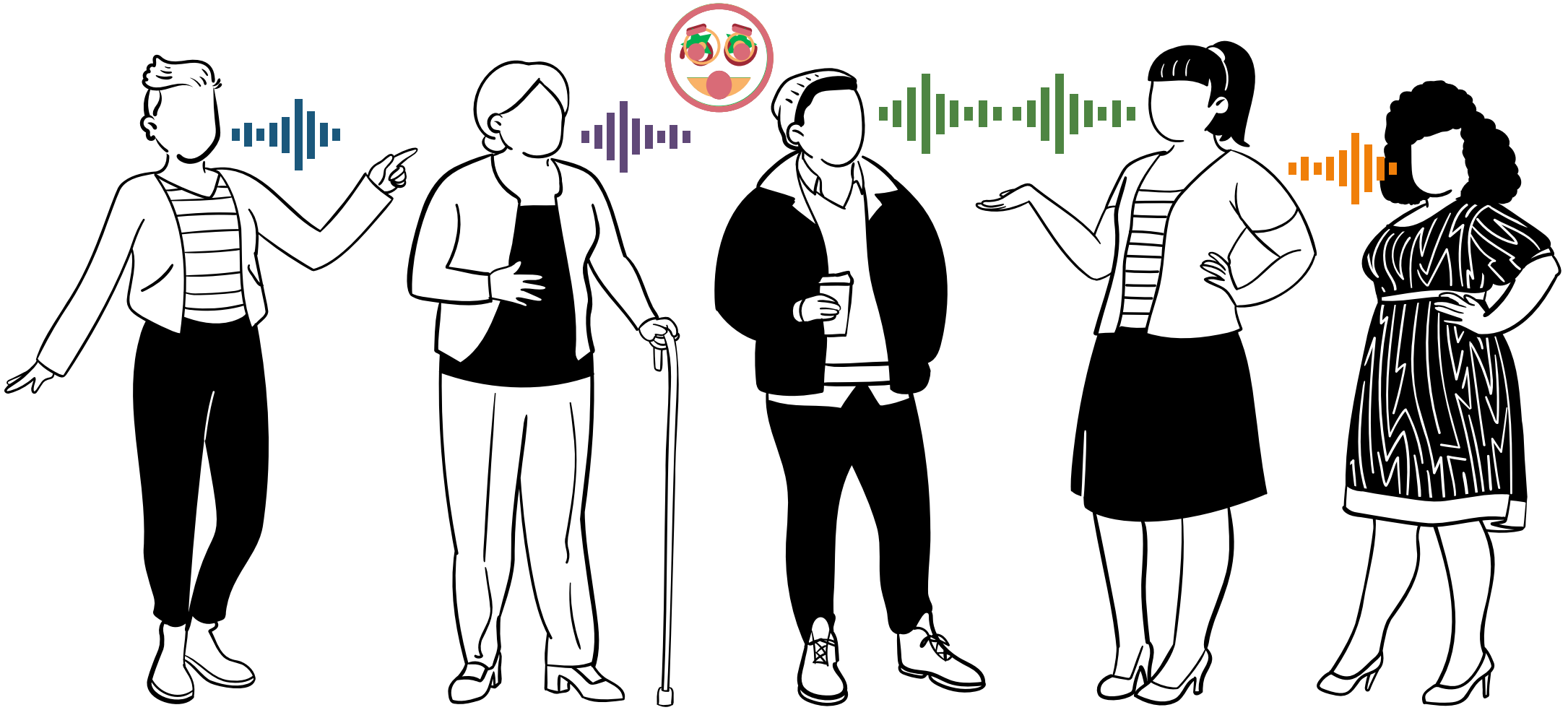
Understanding speech is difficult, especially in noisy contexts.

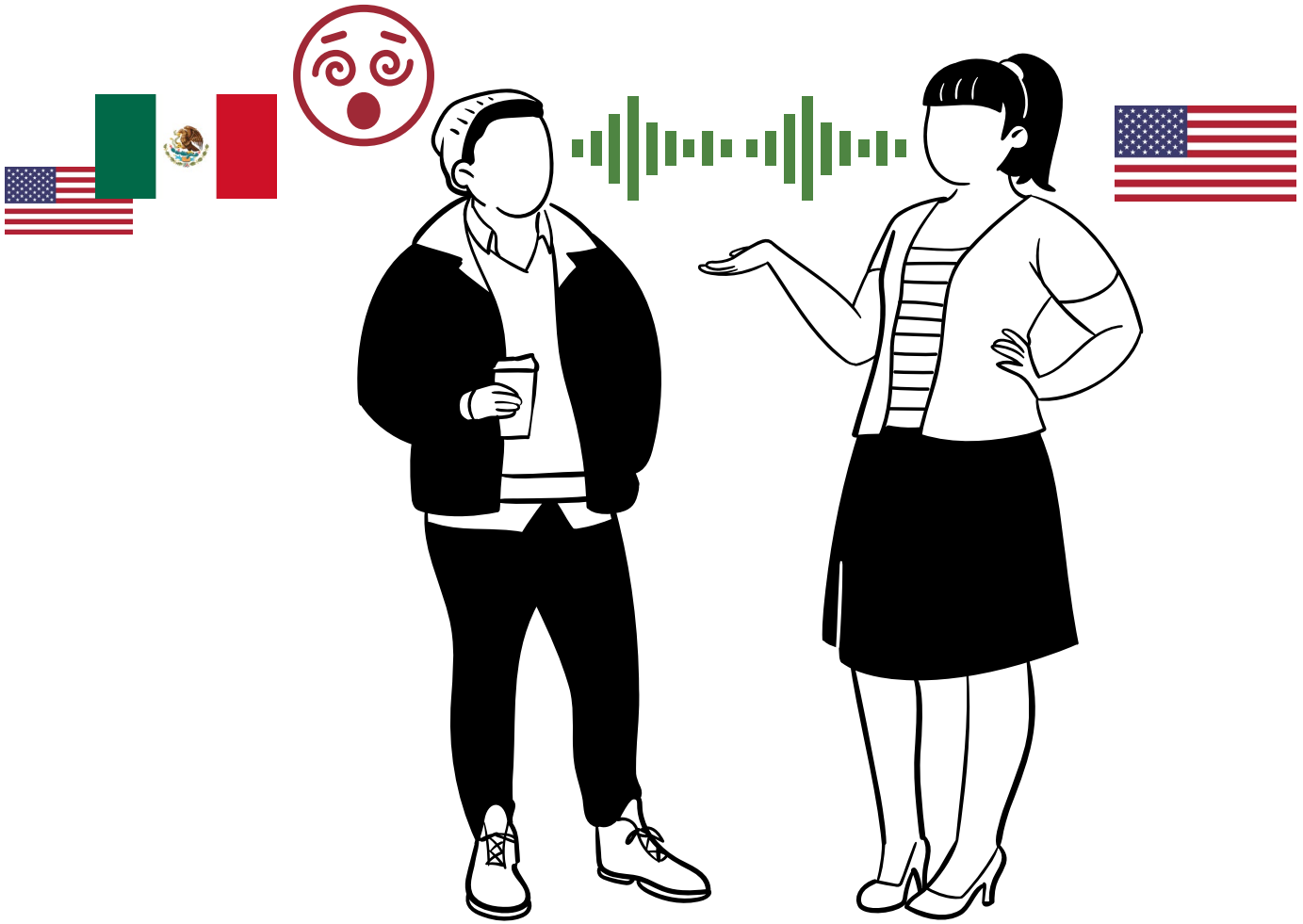


Alain et al., 2018; Killion et al., 2004; Zekveld et al., 2010

Understanding speech is difficult, especially in old age.

Humes & Dubno, 2010; Gosselin & Gagné 2011

Understanding speech is difficult, especially in your second language.



Kroll et al., 2012; Borghini & Hazan, 2018, 2020

Assessing speech-in-noise comprehension relies on language.

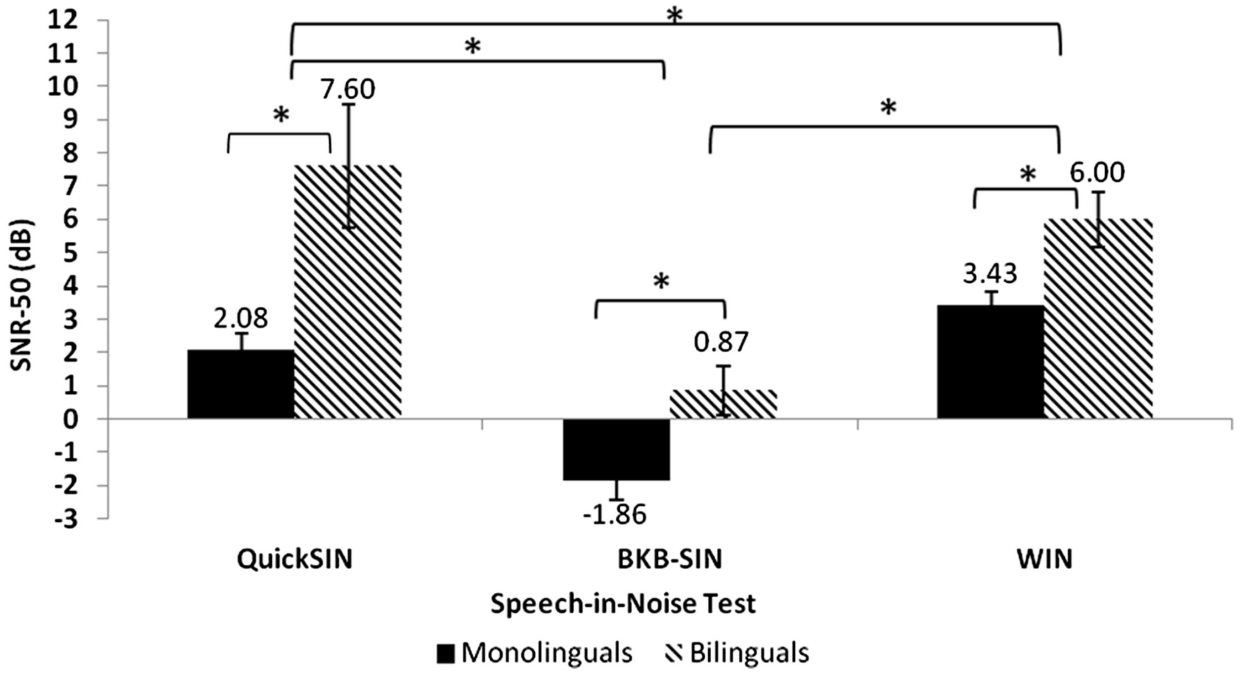
TRACK 21

Practice List A

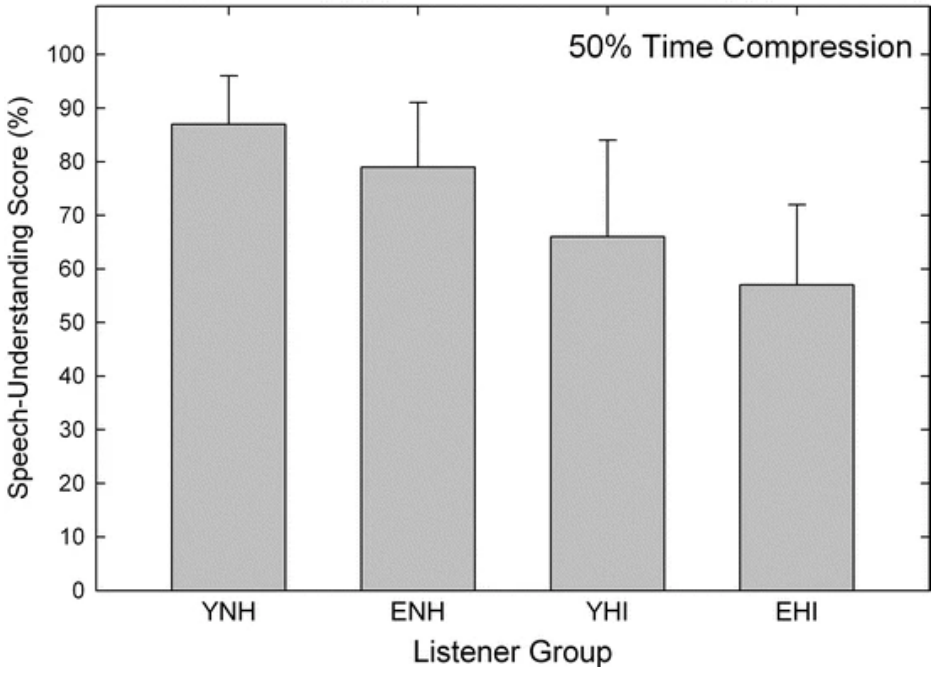
		Score
1. The lake sparkled in the red hot sun.	S/N 25	_____
2. Tend the sheep while the dog wanders.	S/N 20	_____
3. Take two shares as a fair profit.	S/N 15	_____
4. North winds bring colds and fevers.	S/N 10	_____
5. A sash of gold silk will trim her dress.	S/N 5	_____
6. Fake stones shine but cost little.	S/N 0	_____
	TOTAL	_____

Practice sentences used in the Quick Speech-in-Noise (QuickSIN) test.

Assessing speech-in-noise comprehension relies on language.



Mendel & Widner, 2015
(see also Bidelman & Dexter, 2015)



Gordon-Salant & Fitzgibbons, 1993

Bilingual advantages in the brain and in executive function.

Increased gray matter density and white matter integrity.
Li et al., 2014

Improved task-switching and conflict resolution abilities.
Adesope et al. 2010

Better interference inhibition and sustained attention.
Costa et al., 2008

Greater cognitive reserve in older adults.
Woumans et al., 2015

Bialystok, 2017, 2021; Schweizer et al., 2012; Gold, 2015

If bilingualism provides advantages in non-linguistic aspects of executive function, why do bilinguals underperform in assessments of speech-in-noise comprehension?

Reliance on linguistic stimuli, which may be a confounding factor.

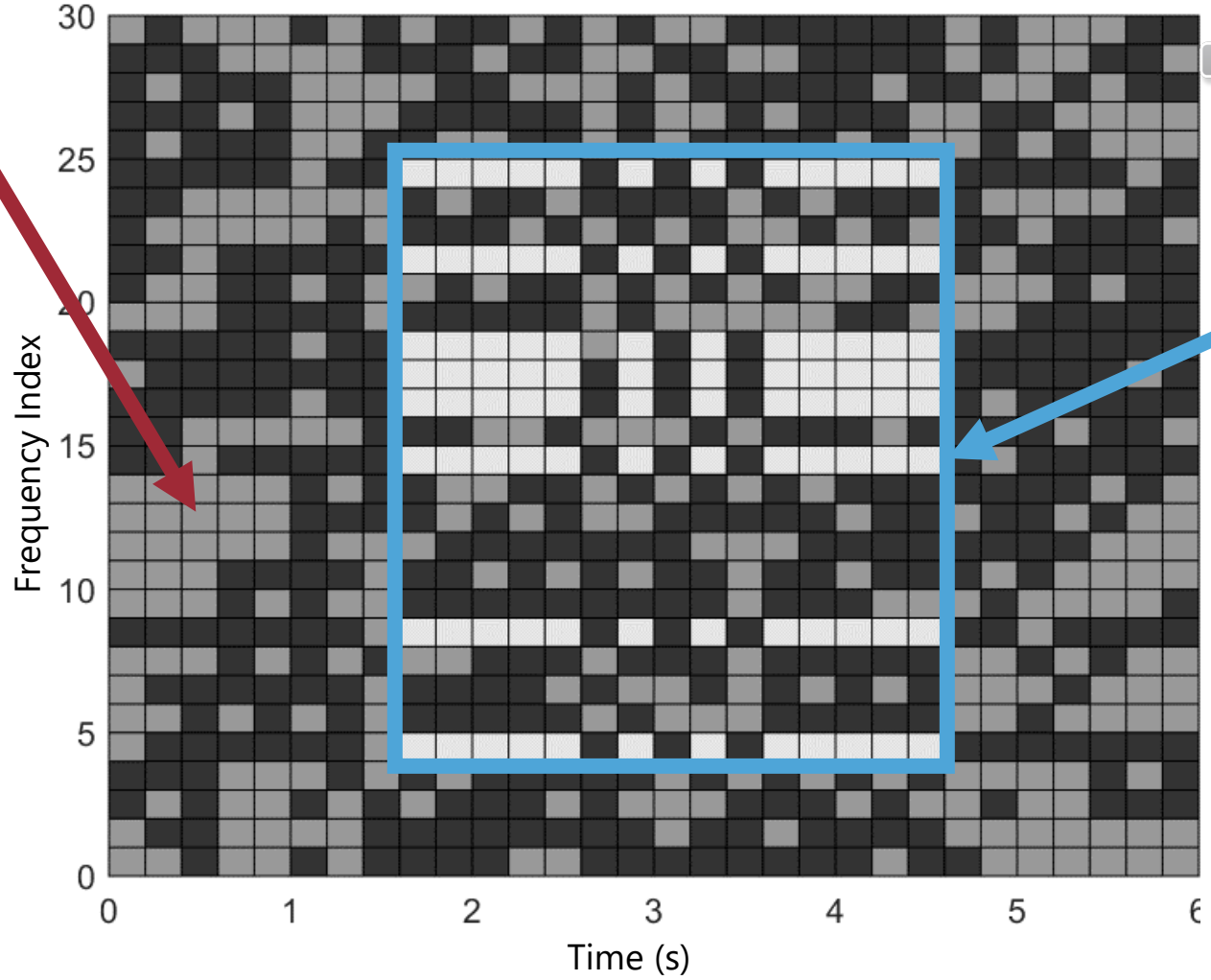
Do bilinguals perform similarly to monolinguals in non-linguistic auditory stream segregation tasks, or even outperform them?

Does performance change with age?

Toward a non-linguistic measure of auditory stream segregation.

Toward a non-linguistic measure of auditory stream segregation.

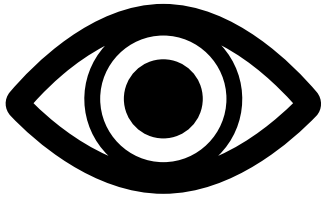
Temporally incoherent random background tones.



Temporally coherent repeating figure chord.

Toward a non-linguistic measure of auditory stream segregation.

Electroencephalography (EEG)



Pupillometry

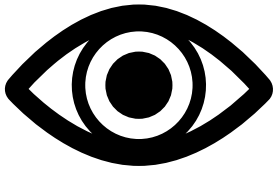
Magnetoencephalography (MEG)

Toward a non-linguistic measure of auditory stream segregation.

Music-in-Noise Task (MINT)

Quick Speech-in-Noise (QuickSIN)

Hearing-in-Noise Task (HINT)



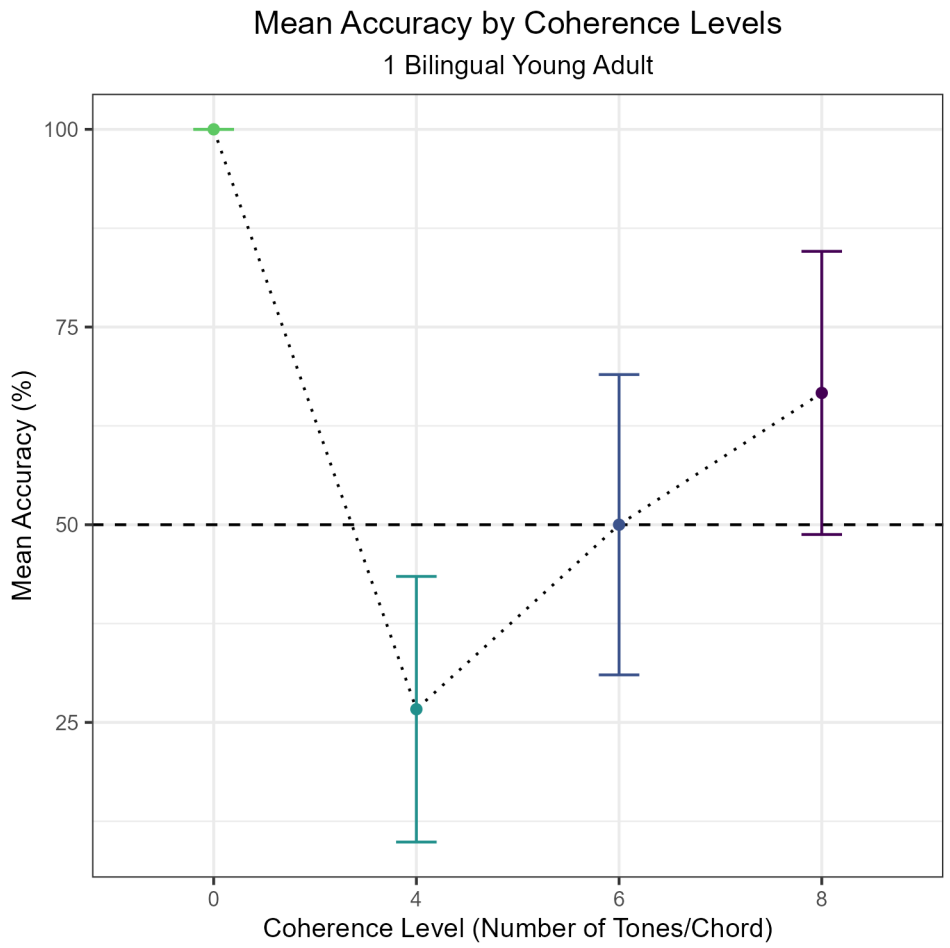
Working Memory

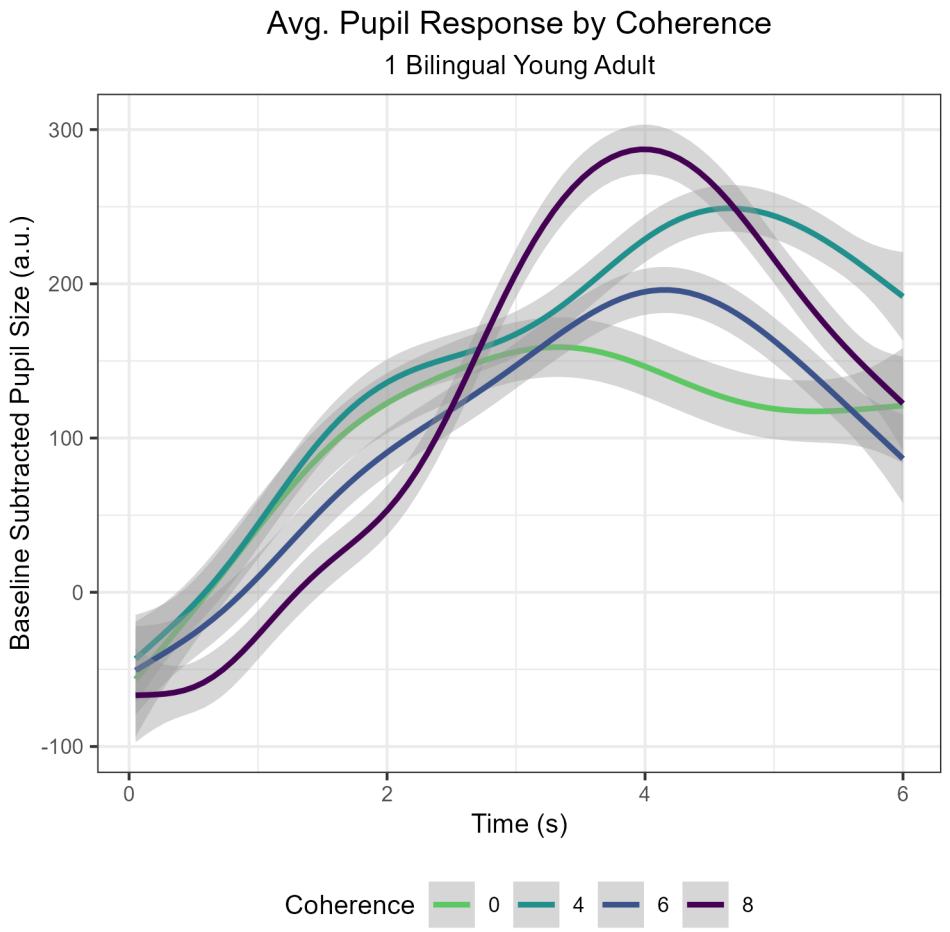
English Fluency

Self-Rated English Proficiency

Musicianship

A sneak peek from one bilingual young adult!





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