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Individual differences in heritage language experience: A meta-analysis of influences on sentence repetition

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Background

- A heritage language (HL) is acquired naturalistically, independent of the majority language (ML) spoken predominantly in the country of residence
- Age, age of onset of the ML, and HL exposure can affect language proficiency, widely measured through sentence repetition tasks
- Variation exists between studies in these results, the methods and measures
- Aim: Estimate the size of these effects across the literature

Research questions

- 1. To what extent is sentence repetition affected by HL experience (age, age of onset of the ML, and HL exposure)?
- 2. Is this effect moderated by whether testing is in the **HL or ML**?
- 3. Is the main effect moderated by task design

(the number of sentences and scoring system)?

Methods

1. Identification

of **404** records identified from databases and other sources

2. Screening

of studies on the effect of
HL experience on
sentence repetition in the
HL and/or ML

3. Inclusion

of **30** studies based on eligibility criteria

4. Data extraction

of publication and participant information, language exposure, task design, research quality and statistics

Results

Effect of HL experience on sentence repetition overall

Author(s) and Year	k		Weights (%)	Fisher's z [95% CI]
Abed Ibrahim et al., 2019	2	├	2.8	-0.36 [-1.03, 0.32]
Andreou et al., 2021	2	 ■	2.7	0.17 [-0.51, 0.86]
Antonijevic-Elliott et al., 2020	4		3	-0.23 [-0.88, 0.42]
Armon-Lotem et al., 2021	2		2.9	0.14 [-0.51, 0.79]
Armon-Lotem et al., 2011	8	 	4	0.11 [-0.45, 0.67]
Chiat et al., 2013	2	<u> </u>	2.5	0.39 [-0.33, 1.10]
Cho et al., 2021	8	 ■ 	3.3	0.32 [-0.29, 0.93]
Correia et al., 2024	6		3.6	0.43 [-0.16, 1.02]
De Cat, 2020	6		3.9	0.04 [-0.53, 0.61]
Fleckstein et al., 2018	2	 	2.4	0.40 [-0.32, 1.13]
Franck & Delage, 2022	1	 •	1.9	0.03 [-0.78, 0.84]
Friesen et al., 2022	6	 ■ 	3.8	-0.54 [-1.12, 0.03]
Hamann et al., 2020	20	├──■	4.3	-0.12 [-0.66, 0.42]
Kaltsa et al., 2020	8	<u> </u>	3.8	-0.52 [-1.10, 0.05]
Komeili et al., 2020	3	<u> </u>	2.9	0.37 [-0.29, 1.04]
Kunduz et al., 2024	2	-	2.6	0.44 [-0.25, 1.13]
Makrodimitris & Petra, 2021	4	┊ ■	3.3	0.51 [-0.10, 1.13]
Meir, 2018	20	 	4.3	0.07 [-0.47, 0.61]
Papastefanou et al., 2019	6		3.7	0.46 [-0.12, 1.04]
Quirk, 2021	10	\ -	3.9	0.49 [-0.07, 1.06]
Scheides & Tuller, 2016	16	⊢ ■	3.9	0.61 [0.04, 1.18]
Sheng et al., 2021	6	<u> </u>	3.7	0.12 [-0.46, 0.70]
Simon-Cereijido et al., 2020	4	<u> </u>	3.5	0.28 [-0.32, 0.88]
Sopata & Dlugosz, 2022a	6	├──₽	3.8	0.00 [-0.57, 0.58]
Sopata & Dlugosz, 2022b	3	├	3.1	0.09 [-0.55, 0.73]
Soto-Corominas et al., 2022	12		4.2	0.20 [-0.34, 0.75]
Thordardottir et al., 2013	1	<u> </u>	1.5	0.40 [-0.52, 1.31]
Torregrossa et al., 2024	8	<u> </u>	3.8	0.06 [-0.51, 0.64]
Tuller et al., 2018	46		4.4	0.04 [-0.49, 0.57]
Wood & Hoge, 2019	2		2.5	0.59 [-0.11, 1.30]
Pooled Estimate		♦	Total: 100 %	0.15 [0.04, 0.26]
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	-2	-1 0 1	2	

General findings

- n = 30, k = 229
- Weak positive correlation with sentence repetition accuracy
- Moderated by testing language
 - HL results (r = .36, p < .0001)
 - ML results (r = -.02, p < .0001)

Sentence repetition task design

- No significant effect of number of sentences
- No significant effect of scoring system

No evidence of publication bias

Subgroup analyses

Age

- n = 25, k = 72
- Weak positive correlation with sentence repetition accuracy (r = .28, p < .0001)
- No significant effect of testing language

Age of onset of the majority language

- n = 16, k = 56
- No evidence that it affects sentence repetition overall
- Moderated by testing language
 - HL results (r = .22, p = .012)
 - ML results (r = -.20, p < .0001)

Exposure to the heritage language

- n = 15, k = 85
- No evidence that it affects sentence repetition overall
- Moderated by testing language
 - HL results (r = .35, p < .0001)
 - ML results (r = -.09, p < .0001)

Conclusion

- Age at time of testing positively correlates with language proficiency
- The higher the age of ML onset and HL exposure, the higher the proficiency in the HL
- The higher the age of ML onset and HL exposure, the lower the proficiency in the ML BUT the effect of exposure is small
- Task design does not moderate these effects

Future research:

- → More consistent and comprehensive reporting practices
- → More research on the effect of HL input quality on language proficiency, particularly in adolescents and adults

