Family input is to the heritage language what formal instruction is to the second language: Evidence from Greek-German bilingual children

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Bilingual acquisition studies suggest different effects of family input and formal instruction. Formal instruction seems to boost development in both languages (heritage language (HL): Dosi & Papadopoulou 2019; Rodina et al. 2020; L2: Paradis et al. 2017; Kaltsa et al. 2019). In contrast, family input in the HL is strongly related to children's HL abilities (Papastefanou et al. 2019; Chondrogianni & Schwartz 2020), whereas family L2 input is only weakly linked to children's L2 abilities (Paradis et al. 2017; Papastefanou et al. 2019). Few studies have examined both types of exposure for the HL and the L2 of heritage children (e.g., Bongartz & Torregrossa 2020), leaving open whether these effects co-exist in the same group of language learners.

Our study examines the predictive role of current family input and formal instruction in the HL Greek and the L2 German for Greek-German children's morpho-syntactic abilities, measured via Sentence Repetition Tasks (SRT) (Greek: Chondrogianni et al. 2013; German: Hamann & Abed Ibrahim 2017). Children's Chronological Age (CA), Age of Onset of German (L2-AoO), Length of Exposure to German (L2-LoE), and verbal Short-Term Memory (vSTM), measured via forward digit-span, were assessed, as these factors have been found to influence SRT-performance (Haman et al. 2017; Papastefanou et al. 2019; Armon-Lotem et al. 2020). Fourty-six children (CA: 6;0–12;8 years, $Mean_{CA}$=9;1) were tested. All had regular contact to Greek from birth (L2-AoO: 0;0–5;10 years, $Mean_{L2-AoO}$=1;10). Current exposure to Greek and German in the family was assessed via the PABIQ (Tuller 2015); current amount of formal instruction in the two languages was calculated as the total of hours per week (Table 1). SRT-responses were scored for target structure (1=maintained/0=changed). Forced-entry linear regression analyses were conducted for each language, with the SRT-scores as the dependent variable and the background factors that correlated with the SRT-scores (Tables 2, 3) as the independent variables. In the model for Greek ($F_{(4,45)}$=22.125, p<.001, adj.R^2=.653), current family input (β=.647, p<.001) and L2-AoO (β=.347, p=.006) were significant predictors of performance. In the model for German ($F_{(5,45)}$= 6.772, p<.001, adj.R^2=.391) performance was predicted by current formal instruction (β=.325, p=.020) and vSTM (β=.436, p=.003).

Our results reveal a clear complementary pattern: children's morpho-syntactic abilities in their HL profit from current family input in the HL, while family input in the L2 does not improve their L2 morpho-syntactic abilities. Conversely, L2 exposure at school helps the L2, but HL exposure at school does not help the HL. Chronological age did not prove significant for either language, suggesting that in bilingual acquisition the driving factors of development can vary independent of age. In the presentation, we also address whether parents' L2 German proficiency may be related to the absence of family input effects in the L2.

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Appendix

Table 1: Mean values (and SDs) of SRT-scores and input variables

	Greek	German	Difference
1. SRT-score (in %)	55.9 (27.9)	80.3 (16.8)	t =-4.719, $p<.001$
2. Current family input	7.0 (3.1)	4.1 (2.8)	t =3.439, $p=.001$
3. Current hours of instruction per week	6.5 (7.2)	19.6 (6.4)	t =-6.485, $p<.001$

Notes: Current input in the family is calculated as a total of 12 points, divided between the two languages.

Table 2: Pearson correlations (one-sided) between outcome and background variables in Greek

		2.	3.	4.	5.	6.	7.
1.	SRT-score_Greek	.767***	.329*	.239	-.316*	.657***	.228
2.	Current family input_Greek	1	.265*	-.021	-.501***	.592***	-.007
3.	Current school input_Greek		1	.022	-.334*	.436**	-.062
4.	Chronological age			1	.643***	.335*	.512***
5.	L2-LoE				1	-.506***	.366**
6.	L2-AoO					1	.127
7.	vSTM						1

Notes: sig. correlations in bold, *p<.05, **p<.01, ***p<.001

Table 3: Pearson correlations (one-sided) between outcome and background variables in German

		2.	3.	4.	5.	6.	7.
1.	SRT-score_German	.398**	.494***	.102	.414**	-.395**	.377**
2.	Current family input_German	1	.414**	.035	.525***	-.607***	.062
3.	Current school input_German		1	.187	.446**	-.338*	.123
4.	Chronological age			1	.643***	.335*	.512***
5.	L2-LoE				1	-506***	.366**
6.	L2-AoO					1	.127
7.	vSTM						1

Notes: sig. correlations in bold, *p<.05, **p<.01, ***p<.001