

Supplemental Material S5. Effect sizes for the untrained language.

Study	PT	TX phase	Outcome measure	Effect size for untrained language					
				CLG-Tx		CLG-Related		CLG-Unrelated	
				Cohen's <i>d</i>	%MPC	Cohen's <i>d</i>	%MPC	Cohen's <i>d</i>	%MPC
Edmonds and Kiran (2006)	P1	1	Custom picture naming (N)	6.36	—	5.66 ^a	—	1.41 ^a	—
	P2	1		0 ^a	—	0 ^a	—	0 ^a	—
		2		2.12	—	1.41 ^a	—	-0.71	—
	P3	1		3.54	—	3.54	—	4.95	—
Ansaldo et al. (2010)	EL	1	WAB - object naming (N)	—	—	—	—	—	56.67
Kiran and Roberts (2010)	P1	1	Custom picture naming (N)	3.54	—	4.24 ^a	—	3.54	—
	P2	1		0 ^a	—	0 ^a	—	0 ^a	—
		2		3.54	—	-3.54	—	-0.71	—
	P3	1		0 ^a	—	2.12 ^a	—	1.06 ^a	—
		2		2.12	—	-1.06 ^a	—	1.06 ^a	—
	P4	1		6.79 ^a	—	7.78	—	1.41	—
Croft et al. (2011) ^b	Saleha	1 (Sem)	Custom picture naming (N)	0 ^a	—	—	—	—	—
		1 (Pho)		0 ^a	—	—	—	—	—
		1 (Mixed)		—	—	—	—	1.41 ^a	—
		2 (Sem)		3.54	—	—	—	—	—
		2 (Pho)		3.54	—	—	—	—	—
		2 (Mixed)		—	—	—	—	0 ^a	—
	Salma	1 (Sem)	Custom picture naming (N)	0.35	—	—	—	—	—
		1 (Pho)		3.54	—	—	—	—	—
		1 (Mixed)		—	—	—	—	0	—
		2 (Sem)		-0.71	—	—	—	—	—
		2 (Pho)		-0.79 ^a	—	—	—	—	—
		2 (Mixed)		—	—	—	—	3.54	—
	Tarik	1 (Sem)	Custom picture naming (N)	7.07	—	—	—	—	—
		1 (Pho)		0.71	—	—	—	—	—

		1 (Mixed)		—	—	—	—	0.71	—
		2 (Sem)		0.42	—	—	—	—	—
		2 (Pho)		0	—	—	—	—	—
		2 (Mixed)		—	—	—	—	0	—
	Azad	1 (Sem)		3.06	—	—	—	—	—
		1 (Pho)		0.71	—	—	—	—	—
		1 (Mixed)	Custom picture naming (N)	—	—	—	—	0.40 ^a	—
		2 (Sem)		2.02 ^a	—	—	—	—	—
		2 (Pho)		1.77	—	—	—	—	—
		2 (Mixed)		—	—	—	—	2.12	—
Kiran and Iakupova (2011)	P1	1	Custom picture naming (N)	3.54	—	2.83	—	3.54 ^a	—
Goral et al. (2012)	JM	1	OANB – object naming (N) German	—	—	—	—	—	-9.52
		1	OANB – object naming (N) French	—	—	—	—	—	0
		1	OANB – object naming (N) English	—	—	—	—	—	-11.54
		1	OANB – action naming (V) German	—	—	—	—	—	20.69
		1	OANB – action naming (V) French	—	—	—	—	—	-10.35
		1	OANB – action naming (V) English	—	—	—	—	—	-19.36
		2	OANB – object naming (N) Spanish	—	—	—	—	—	6.67
		2	OANB – object naming (N) German	—	—	—	—	—	0
		2	OANB – object naming (N) French	—	—	—	—	—	-4.88
		2	OANB – action naming (V) Spanish	—	—	—	—	—	42.86

		2	OANB – action naming (V) German	—	—	—	—	—	-39.13
		2	OANB – action naming (V) French	—	—	—	—	—	9.38
Kiran et al. (2013)	BU07 UT19 UT16 UT18 BU01 UT17 UT20 UT21	1	Custom picture naming (N)	3.54	—	3.54	—	—	—
		1		0.71	—	3.77 ^a	—	0 ^a	—
		1		0 ^a	—	0 ^a	—	0.71	—
		1		1.41 ^a	—	1.41 ^a	—	2.12	—
		1		0.71 ^a	—	1.65	—	2.12	—
		1		0 ^a	—	-2.12	—	-0.71	—
		1		—	0	—	0	—	0
		1		0 ^a	—	0 ^a	—	—	0
Knoph et al. (2017)	DT	1	BAT – naming (N)	—	—	—	—	—	-300.00
Lerman et al. (2019)	PT	1	VST – naming (V)	—	—	—	—	—	38.46
		1	MNT – naming (N)	—	—	—	—	—	50.00
Li et al. (2020)	P1	1	BNT (N)	—	—	—	—	—	11.54
		1	NAVS – action naming (V)	—	—	—	—	—	42.11
	P2	1	BNT (N)	—	—	—	—	—	0
		1	NAVS – action naming (V)	—	—	—	—	—	0
Lerman et al. (2022)	EH03	1	REHAB – action naming (V)	—	—	—	—	0.71	—
		1	REHAB – object naming (N)	—	—	—	—	-6.36	—
		2	REHAB – action naming (V)	—	—	—	—	0 ^a	—
		2	REHAB – object naming (N)	—	—	—	—	-0.71 ^a	—
	EH04	1	REHAB – action naming (V)	—	—	—	—	-0.71	—
		1	REHAB – object naming (N)	—	—	—	—	0.42	—
		2	REHAB – action naming (V)	—	—	—	—	0.71	—
		2	REHAB – object naming (N)	—	—	—	—	-0.71	—
Lopez et al. (2022)	P1	1	Custom picture naming set 1 (N)	6.17 ^a	—	-0.71	—	6.36	—
		1	Custom picture naming set 2 (N)	-1.41	—	0.71	—	1.18	—
		1 & 2 ^c	OANB – object naming (N)	—	—	—	—	—	25.00
		1 & 2 ^c	BNT (N)	—	—	—	—	—	-5.00
		1 & 2 ^c	OANB – action naming (V)	—	—	—	—	—	-50.00

		1 & 2 ^c	NAVS – action naming (V)	—	—	—	—	—	50.00
	P2	1	Custom picture naming set 1 (N)	0.71	—	-1.52 ^a	—	0.76 ^a	—
		1	Custom picture naming set 2 (N)	-0.71	—	0	—	0 ^a	—
		1 & 2 ^c	OANB – object naming (N)	—	—	—	—	—	25.00
		1 & 2 ^c	BNT (N)	—	—	—	—	—	14.29
		1 & 2 ^c	OANB – action naming (V)	—	—	—	—	—	12.50
		1 & 2 ^c	NAVS – action naming (V)	—	—	—	—	—	14.29
Lerman et al. (2023)	EH02	1	REHAB – object naming (N)	—	—	—	—	0.61 ^a	—
		1	REHAB – action naming (V)	—	—	—	—	0.24	—
		2	REHAB – object naming (N)	—	—	—	—	-2.12	—
		2	REHAB – action naming (V)	—	—	—	—	-0.71	—

Note. BAT = Bilingual Aphasia Test (Paradis & Libben, 2014). BNT = Boston Naming Test (Kaplan et al., 2001). CLG-Tx = Cross-language generalization of trained words. CLG-Related = Cross-language generalization of untrained related words. CLG-Unrelated = Cross-language generalization of untrained unrelated words. Mixed = Mixed treatment. MNT = Multilingual Naming Test (Gollan et al., 2012). N = Noun. NAVS = Northwestern Assessment of Verbs and Sentences (Thompson, 2012). OANB = Object and Action Naming Battery (Druks & Masterson, 2000). Pho = Phonological treatment. PT = Participant. REHAB = Revised English-Hebrew Aphasia Battery (Lerman & Goral, n.d.). Sem = Semantic treatment. TX = Treatment. V = Verb. VST = Verb and Sentence Test (Bastiaanse et al., 2002). WAB = Western Aphasia Battery - Revised (Kertesz, 2006). %MPC = Percent of maximum possible change.

^a There was no variance in pre-treatment naming scores. Therefore, a mean of non-zero variances of naming scores in the other pre-treatment phases for the same individual was used in calculation of effect sizes. ^b Each treatment phase in Croft et al. (2011) was divided into two sections. For each section, either semantic or phonological anomia therapy was provided. Different lists of words were trained in semantic and phonological treatment. Therefore, effects of the two types of treatment were measured separately for the trained words. On the other hand, one list of untrained words was used to measure treatment effect of untrained words for each treatment phase combining semantic and phonological therapies. ^c Standardized tests were administered before and after two consecutive treatment phases. Thus, these outcome measures reflect treatment effects from the two phases combined.