

Developmental trajectories of executive and verbal processes in children with phenylketonuria, *Developmental Neuropsychology*

Online Resource 1. Coefficient (standard error), *p* of HLM models evaluating associations among age, group, age x group, and words generated.

	Semantic			Phonemic		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	45.42 (1.0), <i>p</i> < .001***	45.54 (1.2), <i>p</i> < .001***	46.34 (1.3), <i>p</i> < .001***	0.02 (0.1), <i>p</i> = .81	0.11 (0.1), <i>p</i> = .36	0.15 (0.1), <i>p</i> = .20
Age	2.49 (0.3), <i>p</i> < .001***	2.50 (0.3), <i>p</i> < .001***	3.06 (0.4), <i>p</i> < .001***	0.18 (0.3) <i>p</i> < .001***	0.17 (0.02), <i>p</i> < .001***	0.20 (0.03), <i>p</i> < .001***
Group		-0.40 (2.0), <i>p</i> = .84	-2.46 (2.2) <i>p</i> = .27		-0.26 (0.2), <i>p</i> = .19	-0.38 (0.2), <i>p</i> = .06
Age x Group			-1.45 (0.6), <i>p</i> = .02*			-0.10 (0.1), <i>p</i> = .06
Obs.	200	200	200	200	200	200
Outliers (obs.)	1	1	1	1	1	1
Akaike Inf. Crit.	1434.4	1436.3	1432.8	459.4	459.8	458.3
Bayesian Inf. Crit.	1454.2	1459.4	1459.1	479.2	482.9	484.6
Likelihood ratio test (χ^2)	-711.2	-711.2, <i>p</i> = .83	-708.4, <i>p</i> = .02*	-223.7	-222.9, <i>p</i> = .20	-221.1, <i>p</i> = .06

Notes: **p* < .05, ***p* < .01, ****p* < 0.001; significant effects of group (beyond age) and age x group (beyond age and group), assessed using the likelihood ratio test, appear in bold

Online Resource 2. Coefficient (standard error), p of HLM models evaluating associations among age, group, age x group, and phonemic words clustered.

	# Words Clustered			% Words Clustered		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	0.04 (.10), $p = .68$	0.09 (.12), $p = .48$	0.11 (.12), $p = .34$	-0.94 (.06), $p < .001^{***}$	-0.93 (.07), $p < .001^{***}$	-0.93 (.07), $p < .001^{***}$
Age	0.12 (.03), $p < .001^{***}$	0.12 (.03), $p < .001^{***}$	0.15 (.03), $p < .001^{***}$	0.01 (.02), $p = .54$	0.01 (.02), $p < .55$	0.02 (.02), $p = .33$
Group		-0.13 (.20), $p = .50$	-0.24 (.20), $p = .25$		-0.03 (.11), $p = .77$	-0.03 (.11), $p = .76$
Age x Group			-0.10 (.06), $p = .08$			-0.03 (.03), $p = .40$
Obs.	199	199	199	199	199	199
Outliers (obs.)	2	2	2	2	2	2
Akaike Inf. Crit.	520.6	522.2	521.1	999.5	1001.4	1002.7
Bayesian Inf. Crit.	540.4	545.3	547.5	1016.0	1021.2	1002.7
Likelihood ratio test (χ^2)	-254.3	-254.1, $p = .52$	-252.6, $p = .08$	-494.8	-494.7, $p = .77$	-494.4, $p = .40$

Notes: * $p < .05$, ** $p < .01$, *** $p < 0.001$; significant effects of group (beyond age) and age x group (beyond age and group), assessed using the likelihood ratio test, appear in bold

Online Resource 3. Coefficient (standard error), p of HLM models evaluating associations among age, group, age x group, and phonemic singletons.

	# Singletons			% Singletons		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	0.00 (.09), $p = .96$	0.11 (.10), $p = .28$	0.12 (.10), $p = .25$	0.05 (.06), $p = .48$	0.03 (.08), $p = .72$	0.02 (.08), $p = .78$
Age	0.11 (.03), $p < .001^{***}$	0.12 (.02), $p < .001^{***}$	0.14 (.03), $p < .001^{***}$	-0.02 (.02), $p = .40$	-0.02 (.02), $p = .40$	-0.03 (.03), $p = .25$
Group		-0.32 (.18), $p = .07^*$	-0.32 (.18), $p = .07$		0.05 (.13), $p = .71$	0.07 (.13), $p = .60$
Age x Group			-0.06 (.05), $p = .22$			0.04 (.04), $p = .42$
Obs.	199	199	199	199	199	199
Outliers (obs.)	2	2	2	2	2	2
Akaike Inf. Crit.	528.0	526.8	527.2	1199.5	1201.3	1202.7
Bayesian Inf. Crit.	547.7	549.8	553.5	1216.0	1221.1	1225.8
Likelihood ratio test (χ^2)	-258.0	-256.4, $p = .07$	-255.6, $p = .21$	-594.7	-594.7, $p = .71$	-594.4, $p = .43$

Notes: * $p < .05$, ** $p < .01$, *** $p < 0.001$; significant effects of group (beyond age) and age x group (beyond age and group), assessed using the likelihood ratio test, appear in bold

Online Resource 4. Coefficient (standard error), p of HLM models evaluating associations among age, group, age x group, and phonemic clusters.

	# Clusters			% Clusters		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	0.04 (.09), $p = .66$	0.08 (.11), $p = .46$	0.13 (.11), $p = .26$	-1.43 (.04), $p < .001^{***}$	-1.43 (.04), $p < .001^{***}$	-1.43 (.04), $p < .001^{***}$
Age	0.12 (.03), $p < .001^{***}$	0.12 (.03), $p < .001^{***}$	0.16 (.03), $p < .001^{***}$	0.00 (.01), $p = .83$	0.00 (.01), $p = .83$	0.01 (.02), $p = .71$
Group		-0.12 (.18), $p = .49$	-0.26 (.19), $p = .17$		0.01 (.08), $p = .92$	0.01 (.08), $p = .91$
Age x Group			-0.12 (.06), $p = .04^*$			-0.02 (.03), $p = .38$
Obs.	199	199	199	199	199	199
Outliers (obs.)	2	2	2	2	2	2
Akaike Inf. Crit.	533.9	535.5	533.0	789.5	791.5	792.7
Bayesian Inf. Crit.	553.6	558.5	559.3	806.0	811.3	815.8
Likelihood ratio test (χ^2)	-260.9	-260.7, $p = .52$	-258.5, $p = .03^*$	-389.8	-389.8, $p = .92$	-389.4, $p = .36$

Notes: * $p < .05$, ** $p < .01$, *** $p < 0.001$; significant effects of group (beyond age) and age x group (beyond age and group), assessed using the likelihood ratio test, appear in bold

Online Resource 5. Coefficient (standard error), p of HLM models evaluating associations among age, group, age x group, and semantic words clustered.

	# Words Clustered			% Words Clustered		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	22.6 (0.7), $p < .001^{***}$	22.36 (0.9), $p < .001^{***}$	22.55 (0.9), $p < .001^{***}$	-0.01 (0.03), $p = .87$	-0.05 (0.04), $p = .26$	-0.05 (0.04), $p = .28$
Age	1.38 (0.2), $p < .001^{***}$	1.38 (0.2), $p < .001^{***}$	1.5 (0.3), $p < .001^{***}$	0.02 (0.01), $p = .08$	0.02 (0.01), $p = .07$	0.02 (0.01), $p = .17$
Group		0.78 (1.5), $p = .60$	0.35 (1.6), $p = .82$		0.14 (0.07), $p = .07$	0.13 (0.08), $p = .09$
Age x Group			-0.48 (0.5), $p = .33$			0.00 (0.02), $p = .89$
Obs.	198	198	198	198	198	198
Outliers (obs.)	3	3	3	3	3	3
Akaike Inf. Crit.	1339.4	1341.1	1342.3	1156.6	1155.4	1157.4
Bayesian Inf. Crit.	1359.1	1364.1	1368.6	1173.0	1175.1	1180.4
Likelihood ratio test (χ^2)	-663.7	-663.1, $p = .60$	-663.1, $p = .36$	-573.3	-571.7, $p = .07$	-571.7, $p = .89$

Notes: * $p < .05$, ** $p < .01$, *** $p < 0.001$; significant effects of group (beyond age) and age x group (beyond age and group), assessed using the likelihood ratio test, appear in bold

Online Resource 6. Coefficient (standard error), p of HLM models evaluating associations among age, group, age x group, and semantic singletons.

	# Singletons			% Singletons		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	11.31 (0.5), $p < .001^{***}$	12.18 (0.6), $p < .001^{***}$	12.18 (0.6), $p < .001^{***}$	-1.11 (0.06), $p < .001^{***}$	-1.02 (0.07), $p < .001^{***}$	-1.02 (0.07), $p < .001^{***}$
Age	0.31 (0.1), $p = .04^*$	0.29 (0.1), $p = .04^*$	0.51 (0.2), $p = .005^{**}$	-0.02 (0.02), $p = .48$	-0.02 (0.02), $p = .38$	-0.01 (0.02), $p = .71$
Group		-2.64 (1.0), $p = .01^*$	-2.47 (1.0), $p = .02^*$		-0.29 (0.12), $p = .01^*$	-0.27 (0.12), $p = .02^*$
Age x Group			-0.54 (0.3), $p = .07$			-0.03 (0.04), $p = .53$
Obs.	198	198	198	198	198	198
Outliers (obs.)	3	3	3	3	3	3
Akaike Inf. Crit.	1225.1	1220.9	1219.5	1233.8	1230.2	1231.9
Bayesian Inf. Crit.	1244.8	1243.9	1245.8	1250.2	1250.0	1254.9
Likelihood ratio test (χ^2)	-606.53	-603.44, $p = .01^*$	-601.8, $p .07$	-611.9	-609.1, $p = .02^*$	-608.9, $p = .53$

Notes: * $p < .05$, ** $p < .01$, *** $p < 0.001$; significant effects of group (beyond age) and age x group (beyond age and group), assessed using the likelihood ratio test, appear in bold

Online Resource 7. Coefficient (standard error), p of HLM models evaluating associations among age, group, age x group, and semantic clusters.

	# Clusters			% Clusters		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	11.01 (0.3), $p < .001^{***}$	10.96 (0.3), $p < .001^{***}$	11.00 (0.3), $p < .001^{***}$	-1.12 (0.02), $p < .001^{***}$	-1.14 (0.03), $p < .001^{***}$	-1.14 (0.03), $p < .001^{***}$
Age	0.46 (0.1), $p < .001^{***}$	0.46 (0.8), $p < .001^{***}$	0.50 (0.1), $p < .001^{***}$	-0.00 (0.01), $p = .63$	-0.00 (0.01), $p = .57$	-0.01 (0.01), $p = .45$
Group		0.16 (0.5), $p = .76$	0.09 (0.5), $p = .87$		-0.07 (0.05), $p = .19$	0.06 (0.05), $p = .22$
Age x Group			-0.09 (0.2), $p = .60$			0.01 (0.02), $p = .62$
Obs.	198	198	198	198	198	198
Outliers (obs.)	3	3	3	3	3	3
Akaike Inf. Crit.	964.4	966.3	968.0	885.7	886.0	887.8
Bayesian Inf. Crit.	984.1	989.3	994.4	902.2	905.7	910.8
Likelihood ratio test (χ^2)	-476.2	-476.2, $p = .77$	-476.0, $p = .60$	-437.9	-437.0, $p = .19$	-436.9, $p = .62$

Notes: * $p < .05$, ** $p < .01$, *** $p < 0.001$; significant effects of group (beyond age) and age x group (beyond age and group), assessed using the likelihood ratio test, appear in bold

Online Resource 8. Coefficient (standard error), p of HLM models evaluating associations among age, Phe control, and executive or verbal processes in children with PKU.

	Executive Composite				Verbal Composite			
	Mean Phe		SD Phe		Mean Phe		SD Phe	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Intercept	0.02 (0.08), $p = .80$	0.03 (.08), $p = .75$	0.02 (0.08), $p = .80$	0.02 (.08), $p = .78$	0.08 (.12), $p = .53$	0.07 (.12), $p = .60$	0.08 (.12), $p = .53$	0.07 (.12), $p = .55$
Age	0.07 (.02), $p = .006^{**}$	0.10 (.03), $p = .002^{**}$	0.07 (.02), $p = .006^{**}$	0.07 (.02), $p = .005^{**}$	0.10 (.04), $p = .03^*$	0.08 (.04), $p = .07$	0.10 (.04), $p = .03^*$	0.10 (.04), $p = .03^*$
Phe control		-0.001 (.00), $p = .02^*$		-0.001 (.00), $p = .13$		<.001 (.00), $p = .40$		<.001 (.00), $p = .68$
Obs.	68	68	68	68	68	68	68	68
Outliers (obs.)	1	1	1	1	1	1	1	1
Akaike Inf. Crit.	89.4	86.5	89.4	89.1	131.6	132.9	131.6	133.4
Bayesian Inf. Crit.	102.7	102.0	102.7	104.6	144.9	148.4	144.9	149.0
VIF		1.3		1.0		1.2		1.0
Likelihood ratio test (χ^2)	-38.7	-36.2, $p = .03^*$	-38.7	-37.6, $p = .13$	-59.8	-59.4, $p = .39$	-59.8	-59.7, $p = .67$

Notes: * $p < .05$, ** $p < .01$, *** $p < 0.001$; significant effects of Phe control (beyond age), assessed using the likelihood ratio test, appear in bold