

Supplemental Materials

PSID Covariates

One primary adult respondent--typically a male head-of-household--provided child, parent, and household sociodemographic characteristics. Child covariates included child sex (0=male, 1=female); child age at the time of digit span testing measured in years, race (White, Black, Hispanic, Asian or Pacific Islander, American Indian or Alaskan Native, Other); whether the child had ever been diagnosed with a learning disability in 1997 (0=no, 1=yes); reading scores in 1997, 2002, and 2007; and math scores in 1997, 2002, and 2007. Reading scores were measured using the Passage Comprehension (range: 4-43) and Letter-Word (range: 0-57) subscales of the Woodcock-Johnson Psycho-Educational Battery (Woodcock & Johnson, 1989). Math scores were measured using the Applied Problems subscale (range: 0-53) of the Woodcock-Johnson Psycho-Educational Battery (Woodcock & Johnson, 1989). Family covariates included maternal unemployment in 1997 and 2007 (0=no unemployment, 1=received unemployment in the past year), household income in 1997 (range: \$0-70,000), and maternal educational attainment measured in years in 1997. If maternal education scores were missing from 1997 but available in 2007, scores from 2007 were used.

PSID missing data analysis

Using the covariates mentioned above, we conducted missing data analyses, where missing data on the digit span variables were dichotomously coded (0=*non-missing*, 1=*missing*) and t-tests and chi-square tests were conducted. Analyses showed there were differences in forward digit span missingness based on maternal education ($t[7690] = 3.04, p = .0024$), child race ($\chi^2[5] = 19.85, p = .001$), child disability status ($\chi^2[1] = 7.25, p = .007$), children's letter-word scores ($t[6353] = -5.21, p < .001$), children's passage comprehension scores ($t[6784] = -10.34, p < .001$), and children's applied problems scores ($t[6331] = -5.29, p < .001$). Analyses showed there were differences in backward digit span missingness based on maternal education ($t[7690] = 3.03, p = .003$), child race ($\chi^2[5] = 20.30, p = .001$), child disability status ($\chi^2[1] = 8.22, p = .004$), passage comprehension scores ($t[6784] = -10.64, p < .001$), and children's applied problems scores ($t[6331] = -2.17, p = .030$).

ECLS-K:2011 covariates

Children's race and ethnicity was obtained through parent surveys and coded as White, non-Hispanic; Black, non-Hispanic; Hispanic; Asian; American Indian, Hawaiian, Multiracial, or Other. Household income included salary from all sources, interest, assets, and retirement, and was measured in 18 categories, ranging from \$5,000 or less to \$200,001 or more. Guardian education level was coded as the highest grade or year of school completed ranging from 1st grade to doctorate or professional degree, and guardian employment status was coded as an ordered categorical variable ranging from 1 (35 or more hours per week) to 4 (not in the labor force). Children's disability status was reported by parents and indicated whether a child was professionally diagnosed or received therapy for an emotional, psychological, learning, communicative or developmental disorder.

ECLS-K:2011 missing data analysis

Analyses showed there were differences in digit span missingness based on child race ($\chi^2[1] = 479.24, p = .001$), child disability status ($\chi^2[1] = 24.36, p < .001$), children's math scores ($t[107992] = 7.22, p < .001$), and children's reading scores ($t[108091] = 26.07, p < .001$).

Table S1. *Biological Sex Subgroup Analyses of Forward Digit Span in the Full PSID-CDS Sample.*

Functional Form	Forward Digit Span, Females				Forward Digit Span, Males			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Linear	<i>b</i>	0.346	1.196	2.323	0.364	1.228	1.922	
	SE	0.013	0.065	0.233	0.012	0.066	0.259	
	Lower CI	0.320	1.069	1.866	0.340	1.099	1.413	
	Upper CI	0.372	1.323	2.781	0.388	1.357	2.431	
	<i>p</i> -value	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	AIC	253569177			259024696			
	BIC	253569204			259024722			
Quadratic	<i>b</i>		-0.038	-0.149		-0.039	-0.107	
	SE		0.003	0.022		0.003	0.025	
	Lower CI		-0.044	-0.193		-0.044	-0.156	
	Upper CI		-0.032	-0.105		-0.033	2.431	
	<i>p</i> -value		<.001	<.001		<.001	<.001	
	AIC		249222204			254567694		
	BIC		249222237			254567728		
Cubic	<i>b</i>			0.003			0.002	
	SE			0.001			0.001	
	Lower CI			0.002			0.001	
	Upper CI			0.005			0.003	
	<i>p</i> -value			<.001			.005	
	AIC			248640539			254100208	
	BIC			248640579			254100247	
Logarithmic	<i>b</i>				3.667			3.805
	SE				0.124			0.116
	Lower CI				3.421			3.577
	Upper CI				3.909			4.033
	<i>p</i> -value				<.001			<.001
	AIC				250058694			255582623
	BIC				250058720			255582647

Note: Missing data were handled using multiple imputation, and baseline cross-sectional sampling weights were used. PSID-CDS child age range: 3-19 years. Bolded values indicate best fitting models.

Table S2. *Biological Sex Subgroup Analyses of Backward Digit Span in the Full PSID-CDS Sample.*

		Backward Digit Span, Females				Backward Digit Span, Males			
Functional Form		Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Linear	<i>b</i>	0.401	1.161	1.860		0.408	1.168	1.541	
	SE	0.011	0.047	0.174		0.010	0.047	0.167	
	Lower CI	0.380	1.069	1.518		0.387	1.076	1.212	
	Upper CI	0.423	1.253	2.202		0.428	1.260	1.870	
	<i>p</i> -value	<.001	<.001	<.001		<.001	<.001	<.001	
	AIC	233970979				238817864			
	BIC	233971007				238817891			
Quadratic	<i>b</i>		-0.034	-0.103			-0.034	-0.071	
	SE		0.002	0.018			0.002	0.017	
	Lower CI		-0.038	-0.137			-0.038	-0.104	
	Upper CI		-0.030	-0.068			-0.030	-0.038	
	<i>p</i> -value		<.001	<.001			<.001	<.001	
	AIC		229040173				233896857		
	BIC		229040206				233896890		
Cubic	<i>b</i>			0.002				0.001	
	SE			0.001				0.001	
	Lower CI			0.001				0.000	
	Upper CI			0.003				0.002	
	<i>p</i> -value			<.001				.035	
	AIC			228716715				233799591	
	BIC			228716754				233799629	
Logarithmic	<i>b</i>				4.137				4.168
	SE				0.089				0.088
	Lower CI				3.962				3.994
	Upper CI				4.311				4.341
	<i>p</i> -value				<.001				<.001
	AIC				229641460				234718195
	BIC				229641487				234718221

Note: Missing data were handled using multiple imputation, and baseline cross-sectional sampling weights were used. PSID-CDS child age range: 3-19 years. Bolded values indicate best fitting models.

Table S3. *Biological Sex Subgroup Analyses of Backward Digit Span in the Restricted PSID-CDS.*

		Backward Digit Span, Females				Backward Digit Span, Males			
Functional Form		Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Linear	<i>b</i>	0.605	2.600	9.957		0.638	2.141	1.407	
	SE	0.032	0.410	3.491		0.032	0.380	3.634	
	Lower CI	0.543	1.796	3.115		0.575	1.396	-5.716	
	Upper CI	0.668	3.404	16.800		0.702	2.886	8.530	
	<i>p</i> -value	<.001	<.001	.004		<.001	<.001	.699	
	AIC	52345650				52600975			
	BIC	52345670				52600996			
Quadratic	<i>b</i>		-0.116	-1.000			-0.087	0.001	
	SE		0.024	0.419			0.022	0.440	
	Lower CI		-0.164	-1.822			-0.131	-0.861	
	Upper CI		-0.069	-0.178			-0.044	0.863	
	<i>p</i> -value		<.001	.017			<.001	.999	
	AIC		51963865				52392606		
	BIC		51963891				52392632		
Cubic	<i>b</i>			0.035				-0.003	
	SE			0.016				0.017	
	Lower CI			0.002				-0.037	
	Upper CI			0.067				0.031	
	<i>p</i> -value			0.036				0.843	
	AIC			51897847				52391930	
	BIC			51897878				52391961	
Logarithmic	<i>b</i>				5.132				5.402
	SE				0.261				0.265
	Lower CI				4.621				4.882
	Upper CI				5.643				5.922
	<i>p</i> -value				<.001				<.001
	AIC				52133165				52459309
	BIC				52133165				52459329

Note: The age range for the PSID-CDS is restricted to ages 6-11 to mirror the ages in the ECLS-K:2011. Missing data were handled using multiple imputation, and baseline cross-sectional sampling weights were used. Bolded values indicate best fitting models.

Table S4. *Biological Sex Subgroup Analyses of Numbers Reversed in the ECLS-K:2011.*

		Backward Digit Span, Females				Backward Digit Span, Males			
Functional Form		Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Linear	<i>b</i>	7.209	17.778	38.336		7.399	18.287	39.143	
	SE	0.074	0.257	0.780		0.073	0.270	0.733	
	Lower CI	7.064	17.275	36.800		7.256	17.757	37.702	
	Upper CI	7.355	18.282	39.873		7.541	18.817	40.584	
	<i>p</i> -value	<.001	<.001	<.001		<.001	<.001	<.001	
	AIC	169244550				180930462			
	BIC	169244587				180930500			
Quadratic	<i>b</i>		-1.437	-8.181			-1.481	-8.322	
	SE		0.035	0.244			0.036	0.227	
	Lower CI		-1.506	-8.662			-1.552	-8.770	
	Upper CI		-1.368	-7.699			-1.409	-7.875	
	<i>p</i> -value		<.001	<.001			<.001	<.001	
	AIC		168537583				180183106		
	BIC		168537628				180183152		
Cubic	<i>b</i>			0.600				0.609	
	SE			0.021				0.020	
	Lower CI			0.558				0.570	
	Upper CI			0.642				0.648	
	<i>p</i> -value			<.001				<.001	
	AIC			168138011				179773786	
	BIC			168138066				179773841	
Logarithmic	<i>b</i>				20.446				20.959
	SE				0.179				0.177
	Lower CI				20.095				20.612
	Upper CI				20.797				21.307
	<i>p</i> -value				<.001				<.001
	AIC				168082820				179729539
	BIC				168082856				179729576

Note: Missing data were handled using multiple imputation, and baseline cross-sectional sampling weights were used.

Table S5. Sample Means for Forward Digit Span in the PSID-CDS.

Age	Mean	SD	Min	Max
3	2.76	2.19	0	8
4	4.27	2.10	0	9
5	5.44	2.12	0	11
6	6.61	2.29	0	15
7	7.41	2.26	0	15
8	7.94	2.21	2	13
9	8.68	2.40	0	15
10	9.19	2.27	0	15
11	9.14	2.29	2	16
12	9.47	2.45	0	16
13	9.56	2.34	0	16
14	9.67	2.42	4	16
15	9.97	2.30	4	16
16	10.38	2.50	5	16
17	10.33	2.59	4	16
18	10.37	2.59	4	16
19	10.34	2.62	5	16

Note: The PSID-CDS longitudinal weights were used. Means are collapsed across years 1997, 2002, and 2007.

Table S6. Sample Means for Backward Digit Span in the PSID-CDS.

Age	Mean	SD	Min	Max
3	0.57	0.33	0	2
4	0.19	0.63	0	3
5	0.98	1.27	0	4
6	1.88	1.42	0	8
7	3.07	1.44	0	7
8	3.87	1.51	0	10
9	4.31	1.74	0	12
10	4.79	1.92	0	11
11	5.11	1.94	0	12
12	5.45	2.03	0	13
13	5.72	2.14	0	14
14	5.74	2.20	0	13
15	6.12	2.27	0	14
16	6.40	2.39	0	13
17	6.61	2.42	1	14
18	6.70	2.65	2	14
19	6.50	2.23	3	14

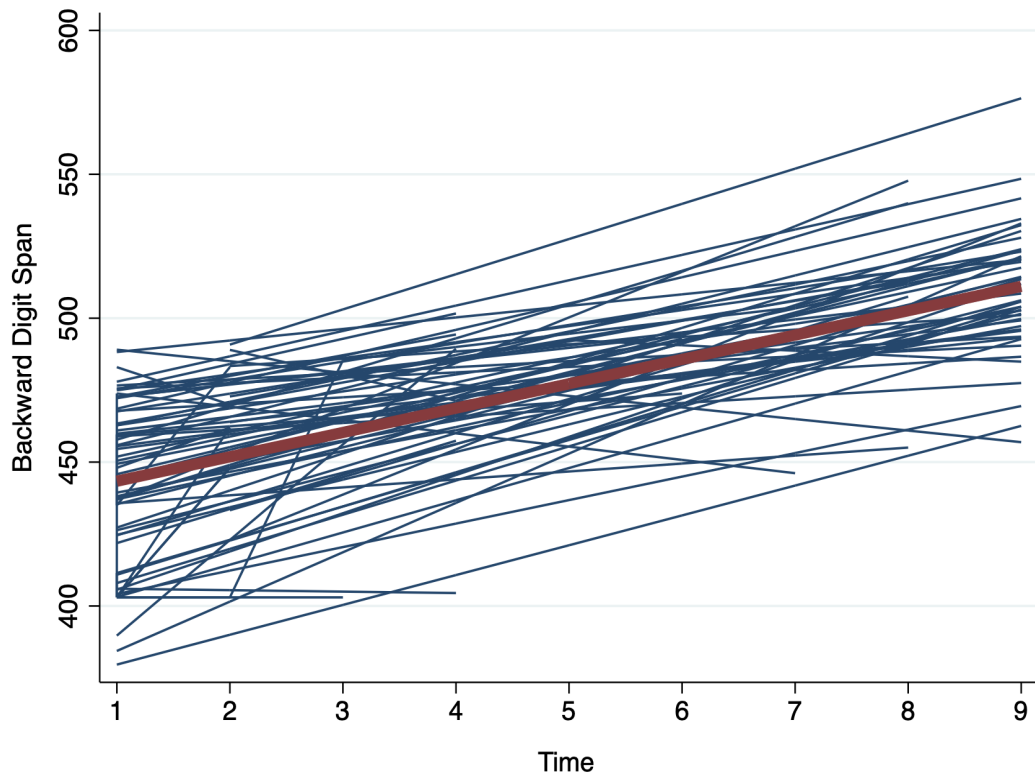
Note: The PSID-CDS longitudinal weights were used. Means are collapsed across years 1997, 2002, and 2007.

Table S7. Sample Means for Numbers Reversed in the ECLS-K:2011.

Time	Mean	SD	Min	Max
1	434.31	30.00	393	563
2	450.93	30.12	393	572
3	458.46	28.09	393	596
4	470.47	24.77	393	596
5	474.84	22.93	403	567
6	481.51	21.81	403	567
7	490.19	21.30	403	603
8	497.42	21.05	403	588
9	503.39	21.80	403	588

Note: The ECLS-K:2011 longitudinal weights were used.

Figure S1. Spaghetti plot of Numbers Reversed performance across time in the ECLSK:2011.



Note: Random subsample of 100 participants.