Supplemental Materials A
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Supplemental Materials B

Results of Model Robustness Checks

Because we had a large number of studies with many participants, we did a check of robustness on our modeling by randomly selecting approximately half of the matrices (107) from the total number of matrices (220). The purpose of this was to test our modeling a subset of the studies as an internal check of validity; however, we experienced a few problems. The first of which was appropriate splitting to ensure enough studies were present in each cell of the matrix. It has been recommended that each cell in the correlation matrix have at least **four** estimates from separate matrices for proper point estimation and confidence interval calculations (Cheung, 2015b). Table B1 includes coverage numbers –values that indicate the number of correlations available in each cell of the composite correlation matrix. As can be seen, there were relatively few studies across the subsample that measured background knowledge, and there were not enough to properly estimate the full composite correlation matrix. Table B2 contains the coverage for all k = 155 studies (220 matrices).

In order to test the robustness of the remaining variables, we ran the models on the two subsets without background knowledge. The results of this model are presented in Table B3 and in Figures B1. Cells with homogeneity estimates (I^2) below 0.1 are highlighted in green.

Table B1.

Coverage matrix for Group 1 (*n* = 107 matrices).

	RC	WRF	TRF	DEC	VOC	LC	RI	WM	BGK
RC	102	31	44	34	65	25	32	30	24
WRF	31	31	13	9	21	12	16	9	11
TRF	44	13	44	13	27	14	5	9	2
DEC	34	9	13	36	25	19	10	13	6
VOC	65	21	27	25	67	22	23	19	17
LC	25	12	14	19	22	27	8	12	2
RI	32	16	5	10	23	8	32	19	13
WM	30	9	9	13	19	12	19	30	8
BGK	24	11	2	6	17	2	13	8	24

For reporting purposes, Table B2 includes the correlation coverage for all 155 studies across 220 matrices.

Table B2.

Coverage matrix for all matrices (*n* = 220).

	RC	WRF	TRF	DEC	VOC	LC	RI	WM	BGK
RC	213	57	88	76	134	54	65	56	44
WRF	57	59	20	19	39	24	29	19	16
TRF	88	20	90	23	54	20	10	16	4
DEC	76	19	23	81	52	32	25	22	15
VOC	134	39	54	52	140	46	47	34	32
LC	54	24	20	32	46	59	19	21	4
RI	65	29	10	25	47	19	68	36	26
WM	56	19	16	22	34	21	36	60	15
BGK	44	16	4	15	32	4	26	15	47

Table B3.

Composite correlation matrix for random subset of matrices (n = 107)

	RC	WRF	TRF	DEC	VOC	LC	RI	WM
RC	--							
WRF	0.475	--						
TRF	0.583	0.717	--					
DEC	0.565	0.559	0.611	--				
VOC	0.56	0.433	0.503	0.488	--			
LC	0.519	0.313	0.396	0.368	0.481	--		
RI	0.432	0.258	0.359	0.366	0.382	0.371	--	
WM	0.346	0.362	0.393	0.359	0.344	0.331	0.346	--

Note. Correlations are below the diagonal; heterogeneity estimates are above the diagonal. Highlighted cells indicate homogenous correlations ($I^2 < 0.1$)

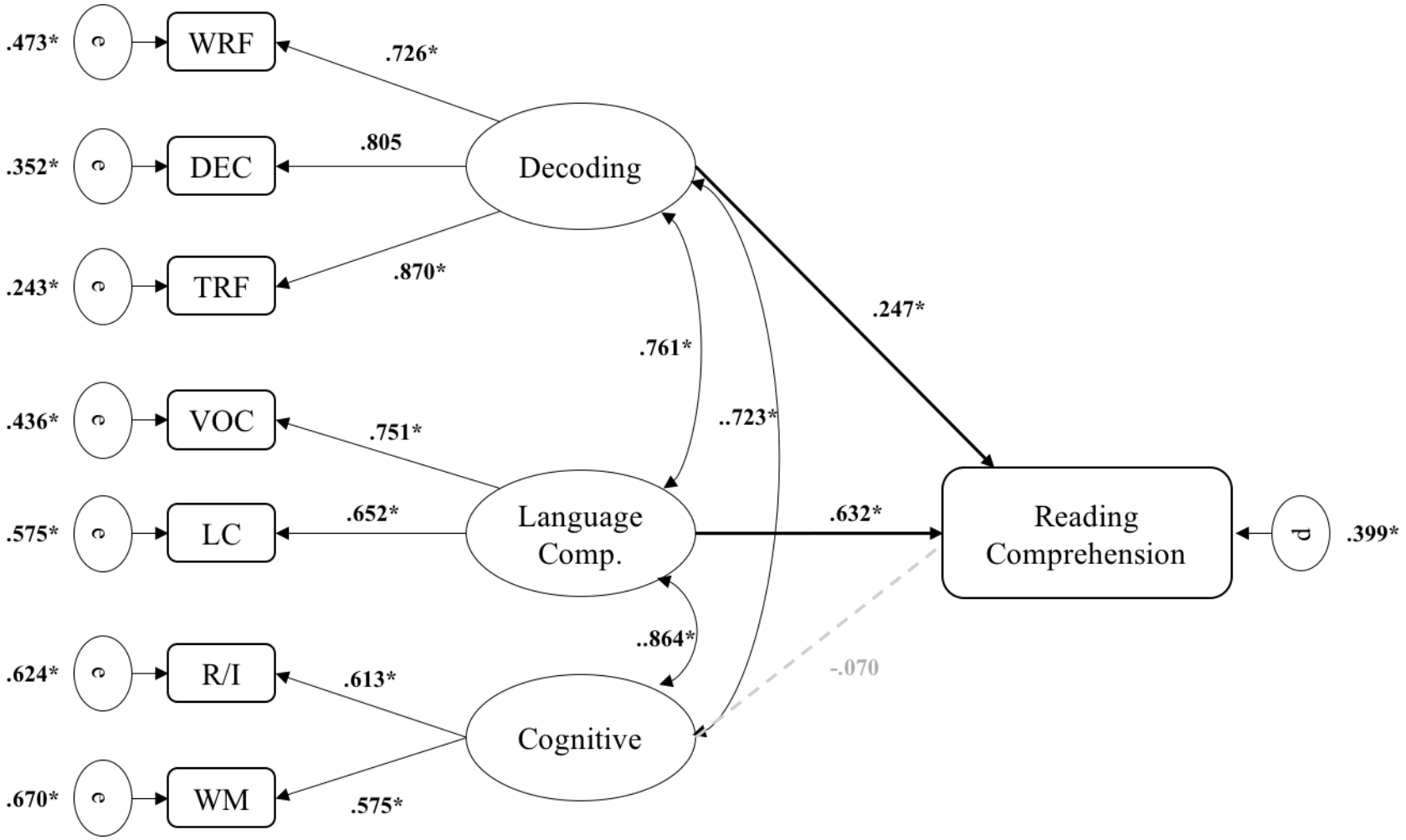

Figure B1. Model results for the random subset (n = 107 matrices) without background knowledge. Model fit: χ^2 [15] = 45.9037, p < .001, CFI = 0.9948, RMSEA = 0.0020 [0.0014 – 0.0027], SRMR = 0.0363.

Supplemental Materials C
Results of the CFA model testing

We tested the factor structure of the components using two CFA models. A two factor model specified that the hypothesized predictors were part of two general factors as specified in the *Simple View of Reading*: Word Decoding and Linguistic Comprehension. The three-factor model introduced a third factor that represented a cognitive factor with reasoning/inference and working memory separate from the linguistic comprehension factor. The three-factor model was the best fitting model for the total sample (See Table C1): working memory and reasoning and inference are part of a component separate from linguistic comprehension (See Figure C1 below).

Table C1

Model fit statistics for the confirmatory factor analyses with the overall sample

	$\chi 2$	df	*p*	CFI	RMSEA	95% CI	SRMR
Two Factor	47.7683	19	0.0003	0.9916	0.0011	(0.0007 - 0.0015)	0.0364
Three Factor	**39.3252**	**17**	**0.0016**	**0.9927**	**0.0010**	**(0.0006 - 0.0015)**	**0.0344**

Note. $\chi 2$ = chi-square test of model fit; df = degrees of freedom for chi-square test. CFI = Confirmatory Fit Index; RMSEA = root mean squared error of approximation; CI = confidence interval; SRMR = standardized root mean square residual. Bolded row = chosen model.

We next fit the two and three factor solutions to the younger and older samples separately. The two factor model was the best fit for the younger sample, as the added complexity and loss of model parsimony with adding the third factor did not result in a better fitting model. The three factor model was the best fit for the older sample (See Table C2).

Cognitive components dissociate from linguistic comprehension for older children and adolescents.

Table C2

Model fit statistics for the confirmatory factor analyses separated by age group

	$\chi 2$	df	*p*	CFI	RMSEA	95% CI	SRMR
Younger Sample							
Two Factor	**31.0531**	**18**	**0.0285**	**0.9985**	**0.0012**	**(0.0004 - 0.0018)**	**0.0347**
Three Factor	29.7194	15	0.0130	0.9983	0.0014	(0.0006 - 0.0021)	0.0339
Older Sample							
Two Factor	65.9586	25	< 0.001	0.9937	0.0016	(0.0011 - 0.0020)	0.0483
Three Factor	**53.8364**	**22**	**0.0002**	**0.9951**	**0.0015**	**(0.0010 - 0.0020)**	**0.0451**

Note. $\chi 2$ = chi-square test of model fit; df = degrees of freedom for chi-square test. CFI = Confirmatory Fit Index; RMSEA = root mean squared error of approximation; CI = confidence interval; SRMR = standardized root mean square residual. Bolded row = chosen model.

Table C3

Correlations and heterogeneity statistics for the older cohort.

Construct	1	2	3	4	5	6	7	8
1. RC	--	.979	.958	.986	.979	.973	.941	.911
2. WRF	.569	--	.984	.988	.984	**.000**	.946	**.000**
3. TRF	.621	.740	--	.982	.991	.939	.984	**.000**
4. DA	.610	.593	.642	--	.968	.972	.986	.881
5. V/M	.542	.450	.533	.470	--	.987	.983	.976
6. LC	.498	**.311**	.405	.376	.483	--	.967	.970
7. R/I	.480	.278	.412	.360	.398	.412	--	.881

8. WM	.360	**.312**	**.318**	.312	.367	.380	.329	--

Note. Correlations are below the diagonal; heterogeneity statistics are above the diagonal. RC = reading comprehension; WRF = word reading fluency; TRF = text reading fluency; V/M = vocabulary and morphological knowledge; LC = listening comprehension; R/I = reasoning and inference. Bolded values indicate homogenous correlations.

Table C4

Correlations and heterogeneity statistics for the older cohort.

Construct	1	2	3	4	5	6	7	8	9
1. RC	--	.963	.990	.992	.987	.981	.984	.971	.981
2. WRF	.394	--	.992	.988	.920	**.000**	**.000**	.939	**.000**
3. TRF	.527	.596	--	.991	.983	.865	.963	.976	.972
4. DA	.438	.589	.522	--	.981	.955	.981	.982	.964
5. V/M	.562	.382	.514	.485	--	.986	.987	.979	.989
6. LC	.494	**.313**	.393	.346	.477	--	.862	.981	**.000**
7. R/I	.434	**.243**	.362	.304	.401	.358	--	.989	.992
8. WM	.324	.272	.363	.336	.316	.292	.352	--	.979
9. BGK	.436	**.302**	.288	.356	.526	**.517**	.376	.323	--

Note. Correlations are below the diagonal; heterogeneity statistics are above the diagonal. RC = reading comprehension; WRF = word reading fluency; TRF = text reading fluency; V/M = vocabulary and morphological knowledge; LC = listening comprehension; R/I = reasoning and inference; BGK = background knowledge. Bolded values indicate homogenous correlations.

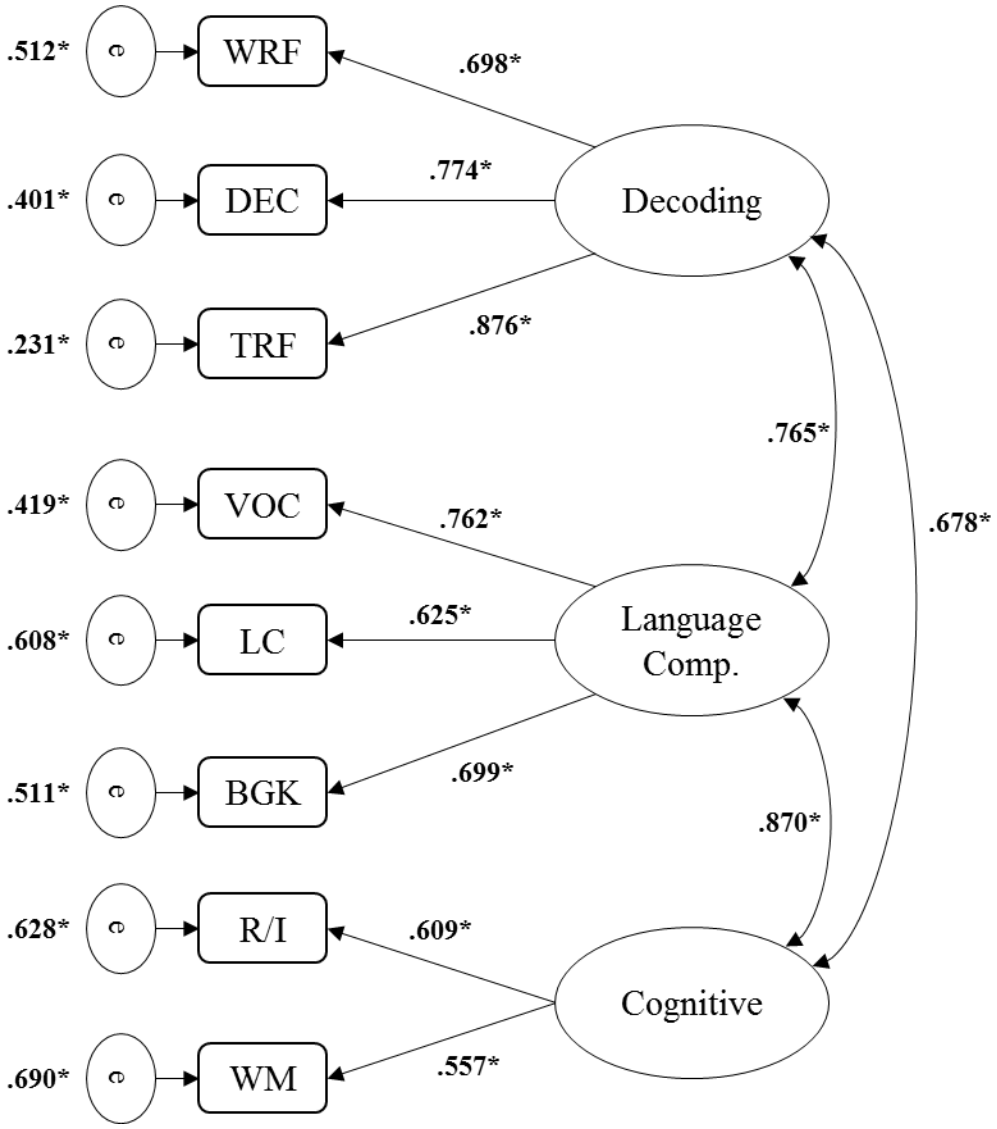

Figure C1. Three factor CFA model for the full sample. WRF = word reading fluency; DEC = decoding accuracy; TRF = text reading fluency; VOC = vocabulary knowledge; LC = listening comprehension; BGK = background knowledge; R/I = reasoning and inference; WM = working memory. e = residual error terms. * = $p < .01$.