

## Online Appendix

### Supplemental Figures and Tables for Exploratory Factor Analyses and for Alternate WAIS–5 Models in Confirmatory Factor Analyses

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Figure 2A

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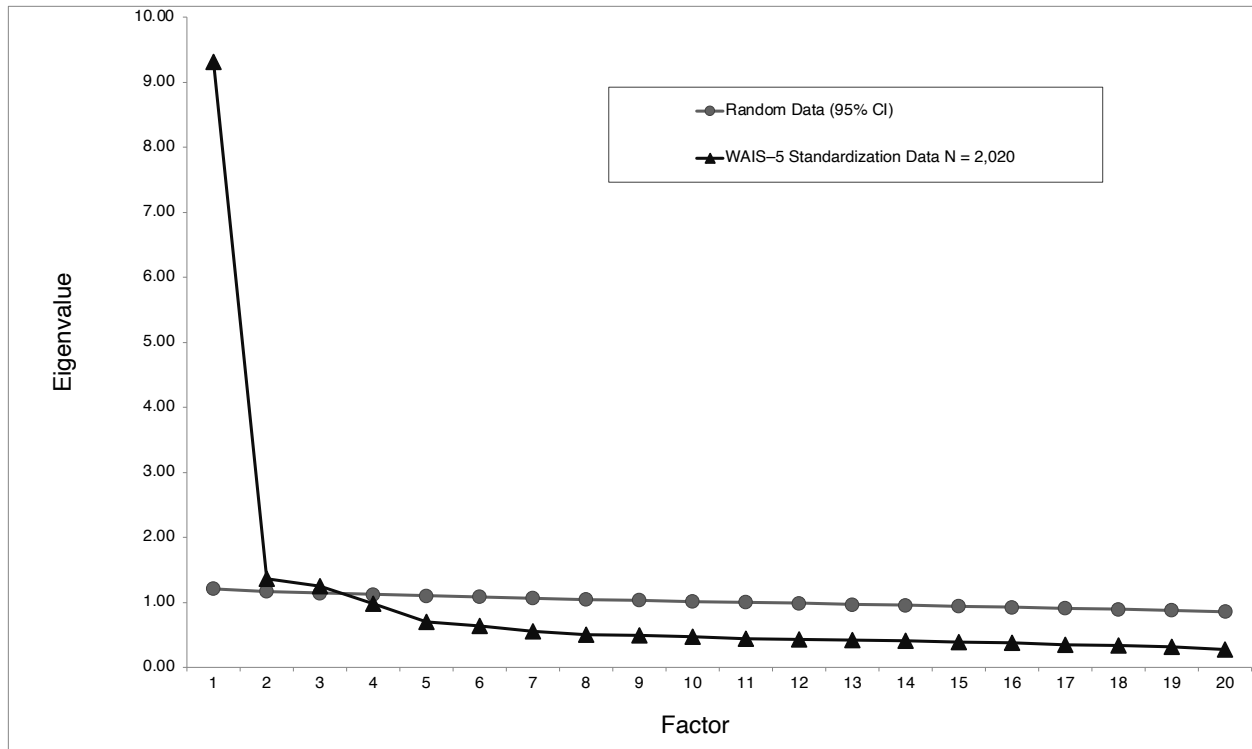
Figure 18A, Table 9A, Figure 19A

##### WAIS–5 Bifactor Model 5b<sub>3</sub>

Figure 20A

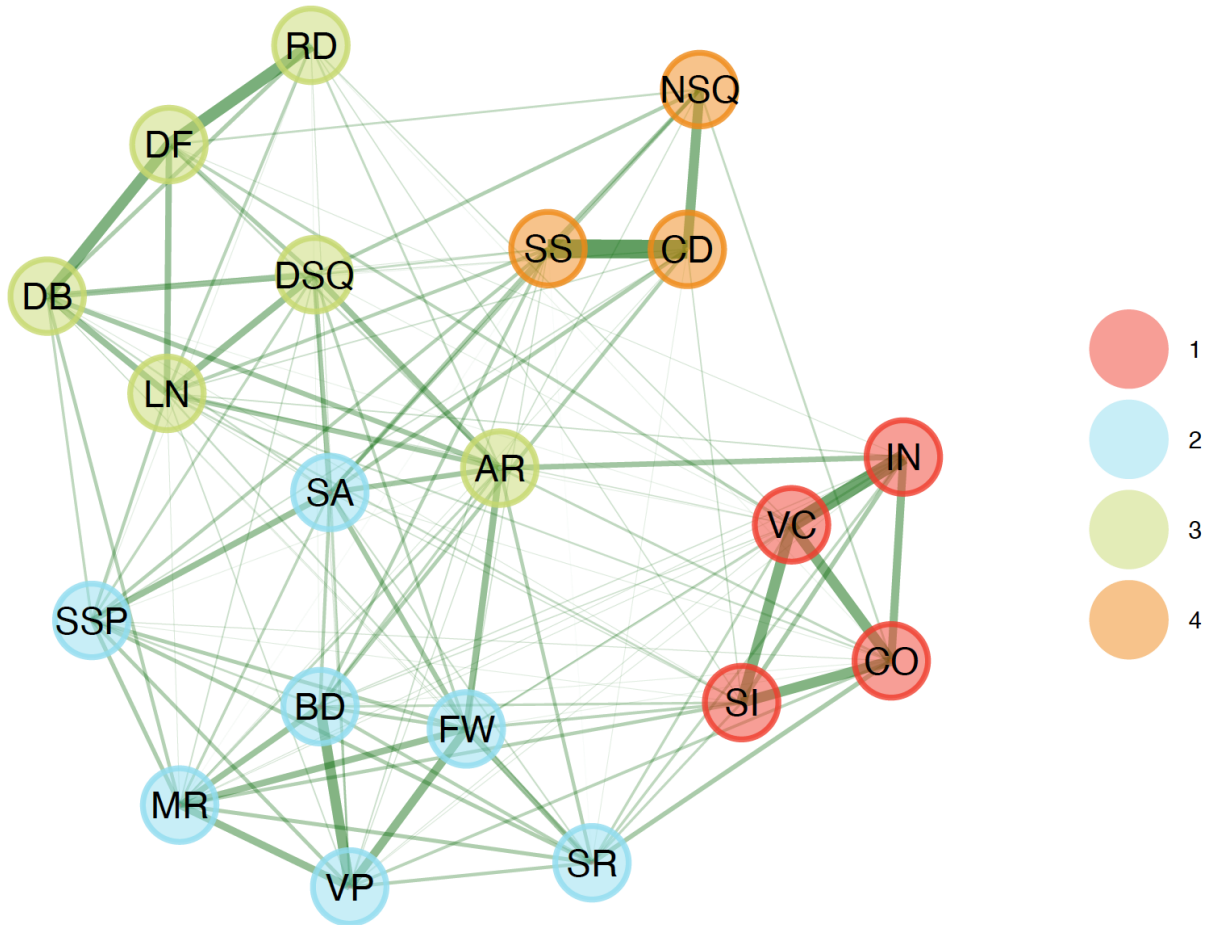
**Figure 1A**

Scree plots for Parallel Analysis for the 20 WAIS-5 Subtests with the Total Standardization Sample (N = 2,020).



**Figure 2A**

Exploratory Graph Analysis (EGA) for the 20 Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) Subtests with the Standardization Sample ( $N = 2,020$ )



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity.

**Table 1A**

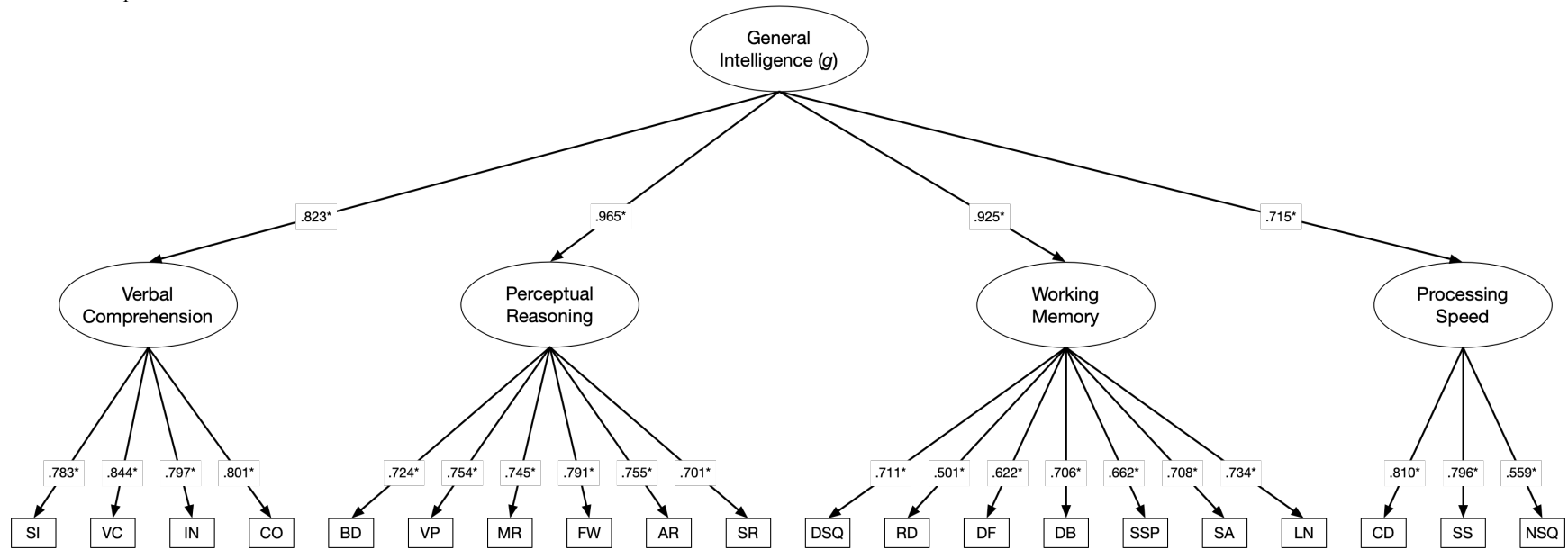
*Wechsler Adult Intelligence Scale-Fifth Edition (WAIS-5) Exploratory Factor Analysis: Two and Three Oblique Factor Solutions for the Total Standardization Sample (N = 2,020)*

WAIS-5 Subtest	Two Oblique Factors				Three Oblique Factors				
	$g^1$	F1	F2	$h^2$	$g^1$	F1	F2	F3	$h^2$
Similarities	.704	<b>.792</b> (.758)	-.046 (.541)	.575	.703	<b>.798</b> (.762)	-.052 (.534)	.002 (.499)	.582
Vocabulary	.726	<b>.945</b> (.813)	-.178 (.522)	.675	.724	<b>.900</b> (.804)	-.219 (.503)	.097 (.554)	.668
Information	.701	<b>.874</b> (.775)	-.134 (.514)	.609	.699	<b>.845</b> (.770)	-.164 (.499)	.069 (.524)	.605
Comprehension	.708	<b>.829</b> (.770)	-.080 (.534)	.595	.706	<b>.829</b> (.772)	-.089 (.526)	.013 (.506)	.599
Block Design	.693	<b>.335</b> (.638)	<b>.408</b> (.657)	.482	.694	<b>.410</b> (.661)	<b>.461</b> (.677)	-.131 (.438)	.526
Visual Puzzles	.711	<b>.408</b> (.670)	<b>.354</b> (.656)	.505	.712	<b>.470</b> (.690)	<b>.383</b> (.668)	-.091 (.467)	.537
Matrix Reasoning	.708	<b>.409</b> (.668)	<b>.350</b> (.653)	.502	.708	<b>.445</b> (.682)	<b>.353</b> (.658)	-.032 (.490)	.519
Figure Weights	.753	<b>.433</b> (.710)	<b>.373</b> (.694)	.566	.753	<b>.474</b> (.724)	<b>.377</b> (.699)	-.038 (.519)	.587
Arithmetic	.752	<b>.426</b> (.708)	<b>.380</b> (.696)	.566	.751	<b>.340</b> (.695)	.245 (.664)	.264 (.647)	.570
Set Relations	.681	<b>.533</b> (.677)	.194 (.589)	.475	.681	<b>.568</b> (.689)	.200 (.591)	-.038 (.467)	.491
Digit Sequencing	.668	.166 (.577)	<b>.555</b> (.678)	.471	.669	.037 (.557)	<b>.380</b> (.641)	<b>.364</b> (.633)	.494
Running Digits	.462	<b>.318</b> (.448)	.175 (.411)	.215	.468	.107 (.413)	-.097 (.346)	<b>.567</b> (.576)	.337
Digits Forward	.568	.279 (.524)	<b>.330</b> (.537)	.323	.588	-.071 (.471)	-.057 (.456)	<b>.879</b> (.795)	.639
Digits Backward	.650	.264 (.586)	<b>.435</b> (.631)	.429	.658	.031 (.549)	.164 (.572)	<b>.600</b> (.726)	.546
Symbol Span	.649	.220 (.574)	<b>.479</b> (.641)	.433	.648	.228 (.581)	<b>.448</b> (.640)	.037 (.477)	.437
Spatial Addition	.704	.143 (.600)	<b>.616</b> (.723)	.532	.703	.152 (.608)	<b>.581</b> (.722)	.047 (.521)	.536
Letter-Number Sequencing	.694	<b>.314</b> (.634)	<b>.432</b> (.665)	.486	.697	.148 (.607)	.221 (.617)	<b>.448</b> (.688)	.535
Coding	.590	-.170 (.432)	<b>.813</b> (.687)	.485	.590	-.146 (.445)	<b>.837</b> (.709)	-.034 (.408)	.515
Symbol Search	.606	-.170 (.446)	<b>.831</b> (.705)	.510	.607	-.148 (.458)	<b>.849</b> (.725)	-.024 (.424)	.538
Naming Speed Quantity	.451	-.097 (.339)	<b>.588</b> (.516)	.270	.450	-.119 (.339)	<b>.538</b> (.513)	.096 (.363)	.270
Eigenvalue		9.31	1.36			9.31	1.36	1.25	
% Variance		44.10	4.42			44.27	4.48	3.90	
Factor Correlations		F1	F2			F1	F2	F3	
	F1	–			F1	–			
	F2	.741	–		F2	.732	–		
					F3	.664	.643	–	

*Note.* <sup>1</sup>General structure coefficients based on first unrotated factor coefficients ( $g$  loadings). Factor pattern coefficients (structure coefficients) based on principal factors extraction with promax rotation ( $k = 4$ ).  $h^2$  = Communality. Salient pattern coefficients presented in bold (pattern coefficient  $\geq .30$ )

Figure 3A  
 WAIS-5 Higher-Order Model 4h<sub>1</sub> with Four Group Factors

Model 4h<sub>1</sub>



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ .

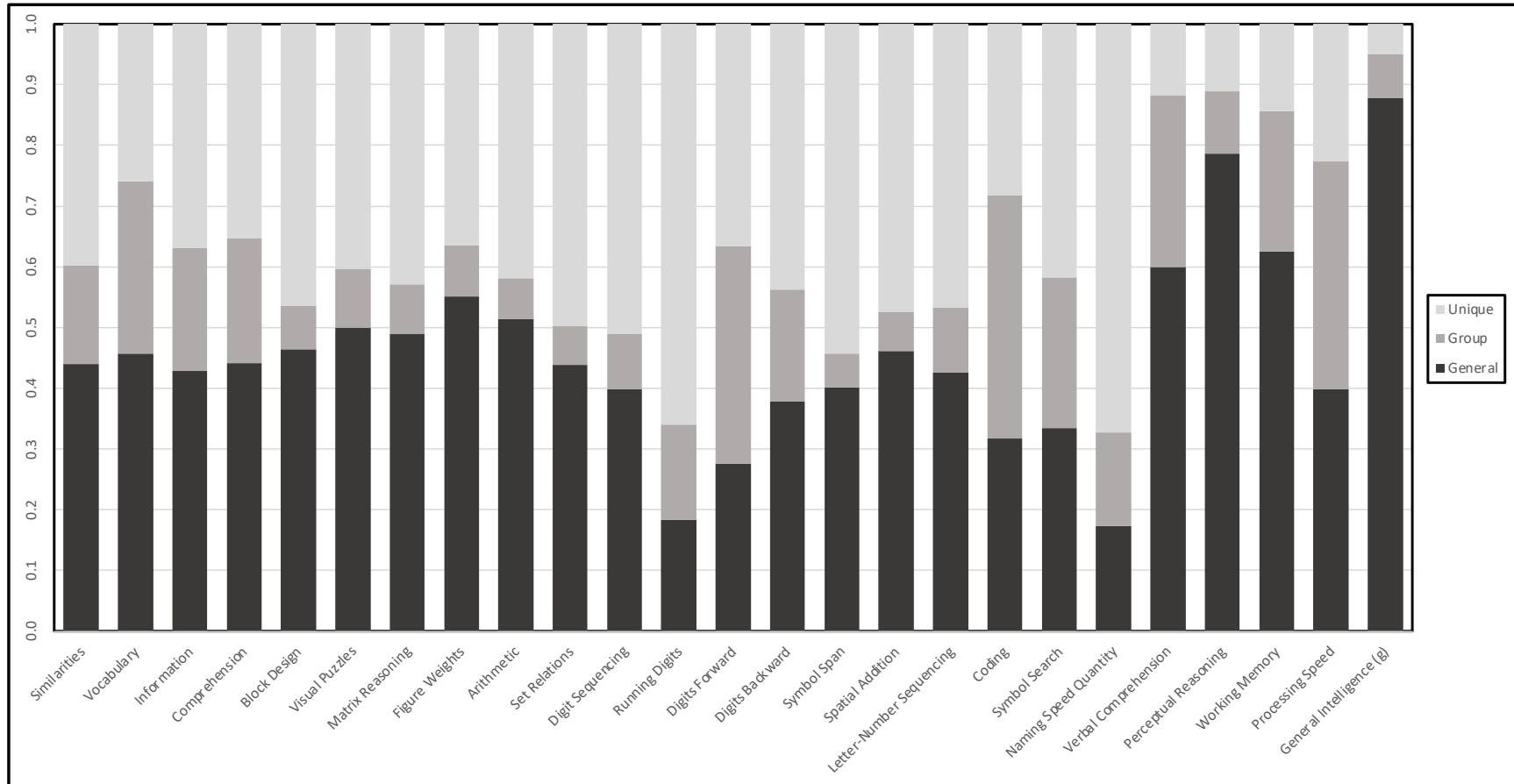
**Table 2A**

Sources of Variance in the Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) 20 Subtests According to a Schmid-Leiman Orthogonalized Higher-Order Factor Model (4h<sub>1</sub>) with Four First-Order (Group) Factors for the Total Standardization Sample (N = 2,020)

WAIS–5 Subtest	General		Verbal Comprehension		Perceptual Reasoning		Working Memory		Processing Speed		<i>h</i> <sup>2</sup>	<i>u</i> <sup>2</sup>	ECV
	<i>b</i>	<i>S</i> <sup>2</sup>	<i>b</i>	<i>S</i> <sup>2</sup>	<i>b</i>	<i>S</i> <sup>2</sup>	<i>b</i>	<i>S</i> <sup>2</sup>	<i>b</i>	<i>S</i> <sup>2</sup>			
Similarities	.644	.415	.445	.198							.613	.387	.677
Vocabulary	.695	.483	.479	.229							.712	.288	.678
Information	.656	.430	.453	.205							.636	.364	.677
Comprehension	.659	.434	.455	.207							.641	.359	.677
Block Design	.699	.489			.190	.036					.525	.475	.931
Visual Puzzles	.728	.530			.198	.039					.569	.431	.931
Matrix Reasoning	.719	.517			.195	.038					.555	.445	.931
Figure Weights	.763	.582			.207	.043					.625	.375	.931
Arithmetic	.729	.531			.198	.039					.571	.429	.931
Set Relations	.676	.457			.184	.034					.491	.509	.931
Digit Sequencing	.658	.433					.270	.073			.506	.494	.856
Running Digits	.463	.214					.190	.036			.250	.750	.856
Digits Forward	.575	.331					.236	.056			.386	.614	.856
Digits Backward	.653	.426					.268	.072			.498	.502	.856
Symbol Span	.612	.375					.252	.064			.438	.562	.855
Spatial Addition	.655	.429					.269	.072			.501	.499	.856
Letter-Number Sequencing	.679	.461					.279	.078			.539	.461	.856
Coding	.579	.335							.566	.320	.656	.344	.511
Symbol Search	.569	.324							.557	.310	.634	.366	.511
Naming Speed Quantity	.400	.160							.391	.153	.313	.687	.511
Total Variance		.418		.042		.011		.023		.039	.561	.439	
ECV		.784		.079		.022		.042		.074			
$\omega$		.949		.882		.882		.847		.770			
$\omega_H/\omega_{HS}$		.894		.284		.061		.122		.377			
Relative $\omega$		.942		.323		.069		.144		.489			
Factor Correlation		.945		.533		.246		.350		.614			
<i>H</i>		.939		.515		.193		.326		.524			
PUC		.763											
FDI		.969		.718		.439		.571		.724			

Note. *b* = standardized loading of subtest on factor, *S*<sup>2</sup> = variance explained, *h*<sup>2</sup> = communality, *u*<sup>2</sup> = uniqueness, ECV = explained common variance,  $\omega$  = Omega,  $\omega_H$  = Omega-hierarchical (general factor),  $\omega_{HS}$  = Omega-hierarchical subscale (group factors), *H* = construct reliability index, PUC = percentage of uncontaminated correlations, FDI = factor determinacy index. Light shaded cells indicate minimum standard met; dark shaded cells indicate preferred/desired standard met.

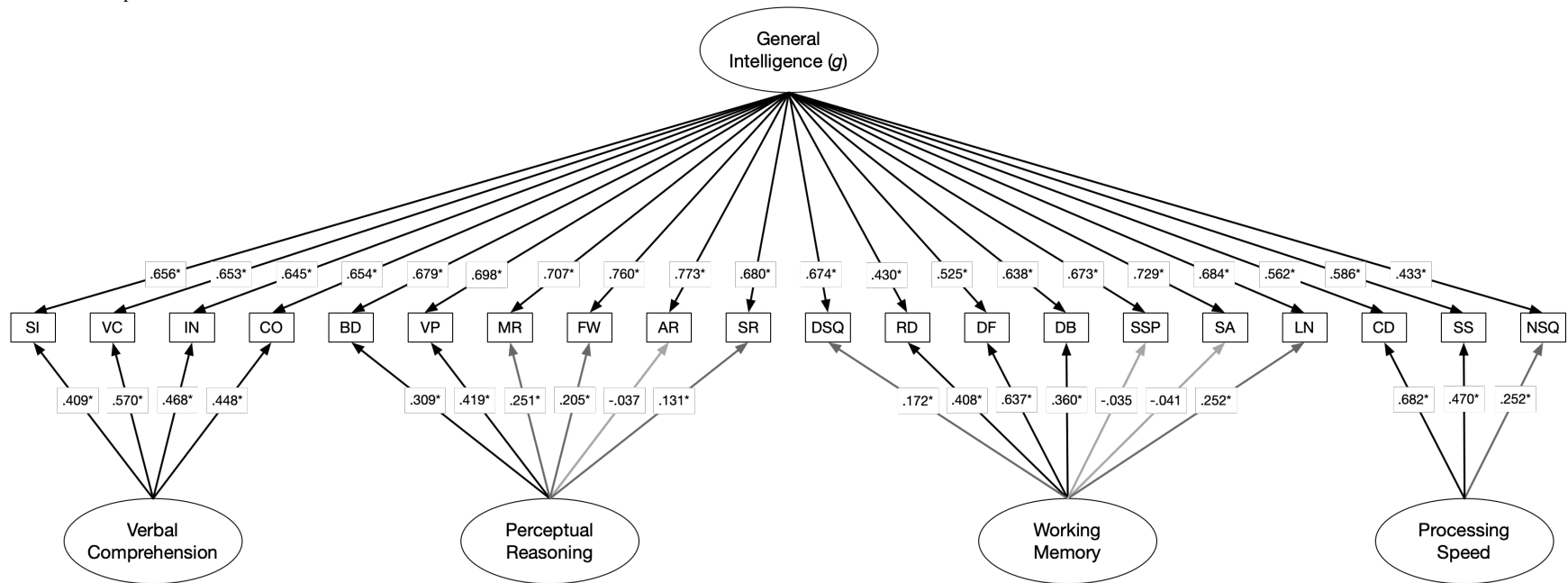
Figure 4A  
 WAIS-5 Subtest and Composite Score Variance Sources for Higher-Order Model 4h<sub>1</sub>



*Note.* The Y-axis displays total variance for subtests and explained common variance for composite scores.

Figure 5A  
 WAIS-5 Bifactor Model 4b<sub>1</sub> with Four Group Factors

Model 4b<sub>1</sub>



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ . Light shaded paths reflect statistically non-significant coefficients.

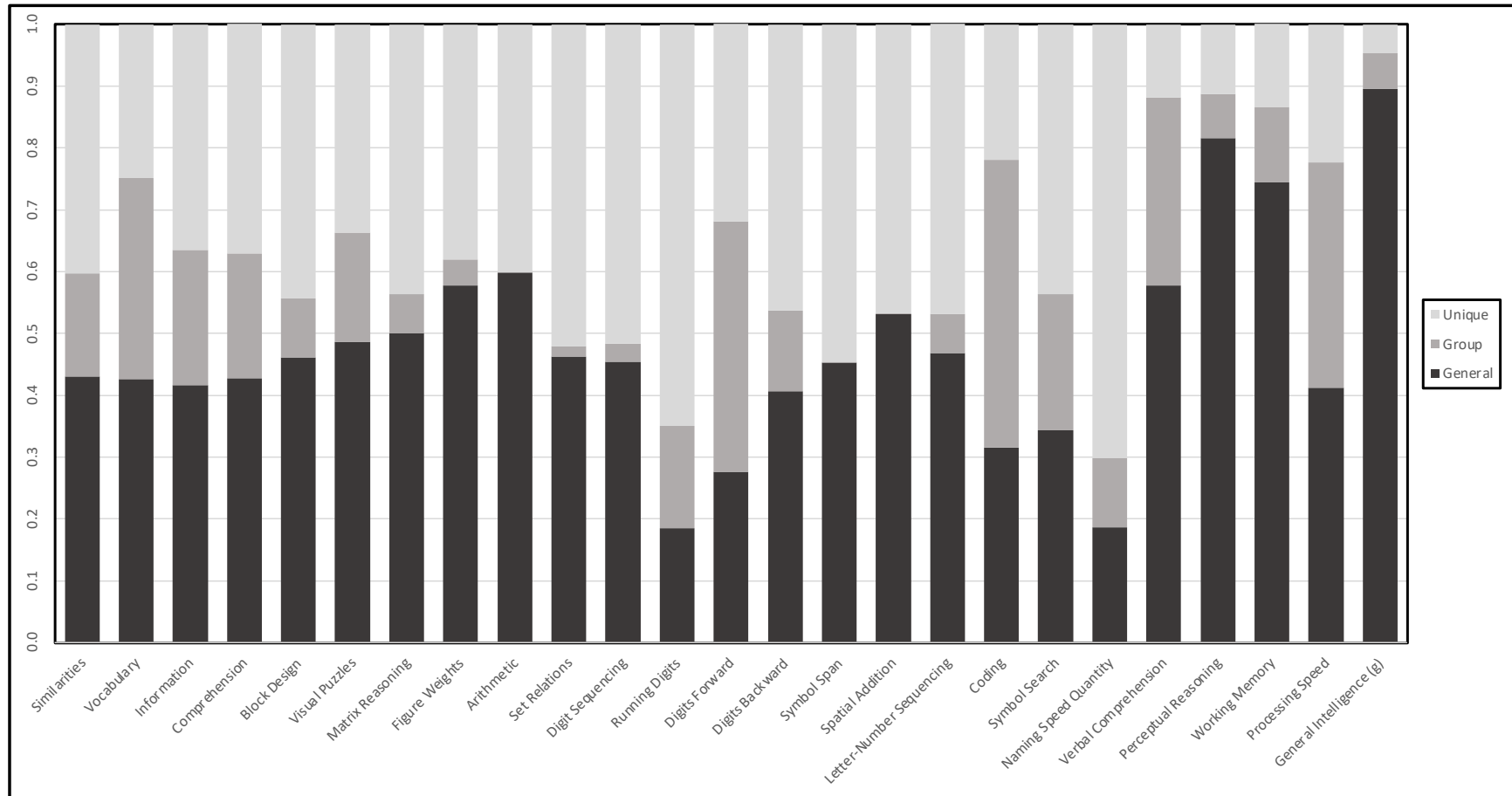
**Table 3A**

Sources of Variance in the Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) 20 Subtests According to a Bifactor Model (4b<sub>1</sub>) with Four First–Order (Group) Factors for the Total Standardization Sample (N = 2,020)

WAIS–5 Subtest	General		Verbal Comprehension		Perceptual Reasoning		Working Memory		Processing Speed		<i>h</i> <sup>2</sup>	<i>u</i> <sup>2</sup>	ECV
	<i>b</i>	<i>S</i> <sup>2</sup>	<i>b</i>	<i>S</i> <sup>2</sup>	<i>b</i>	<i>S</i> <sup>2</sup>	<i>b</i>	<i>S</i> <sup>2</sup>	<i>b</i>	<i>S</i> <sup>2</sup>			
Similarities	.656	.430	.409	.167							.598	.402	.720
Vocabulary	.653	.426	.570	.325							.751	.249	.568
Information	.645	.416	.468	.219							.635	.365	.655
Comprehension	.654	.428	.448	.201							.628	.372	.681
Block Design	.679	.461			.309	.095					.557	.443	.828
Visual Puzzles	.698	.487			.419	.176					.663	.337	.735
Matrix Reasoning	.707	.500			.251	.063					.563	.437	.888
Figure Weights	.760	.578			.205	.042					.620	.380	.932
Arithmetic	.773	.598			-.037	.001					.599	.401	.998
Set Relations	.680	.462			.131	.017					.480	.520	.964
Digit Sequencing	.674	.454					.172	.030			.484	.516	.939
Running Digits	.430	.185					.408	.166			.351	.649	.526
Digits Forward	.525	.276					.637	.406			.681	.319	.405
Digits Backward	.638	.407					.360	.130			.537	.463	.758
Symbol Span	.673	.453					-.035	.001			.454	.546	.997
Spatial Addition	.729	.531					-.041	.002			.533	.467	.997
Letter-Number Sequencing	.684	.468					.252	.064			.531	.469	.880
Coding	.562	.316							.682	.465	.781	.219	.404
Symbol Search	.586	.343							.470	.221	.564	.436	.609
Naming Speed Quantity	.433	.187							.333	.111	.298	.702	.628
Total Variance		.420		.046		.020		.040		.040	.565	.435	
ECV		.743		.081		.035		.071		.070			
$\omega$		.953		.882		.889		.865		.776			
$\omega_H/\omega_{HS}$		.896		.305		.072		.121		.364			
Relative $\omega$		.940		.346		.081		.140		.469			
Factor Correlation		.946		.552		.269		.347		.603			
<i>H</i>		.940		.548		.310		.531		.561			
PUC		.763											
FDI		.970		.740		.556		.729		.749			

Note. *b* = standardized loading of subtest on factor, *S*<sup>2</sup> = variance explained, *h*<sup>2</sup> = communality, *u*<sup>2</sup> = uniqueness, ECV = explained common variance,  $\omega$  = Omega,  $\omega_H$  = Omega-hierarchical (general factor),  $\omega_{HS}$  = Omega-hierarchical subscale (group factors), *H* = construct reliability index, PUC = percentage of uncontaminated correlations, FDI = factor determinacy index. Light shaded cells indicate minimum standard met; dark shaded cells indicate preferred/desired standard met.

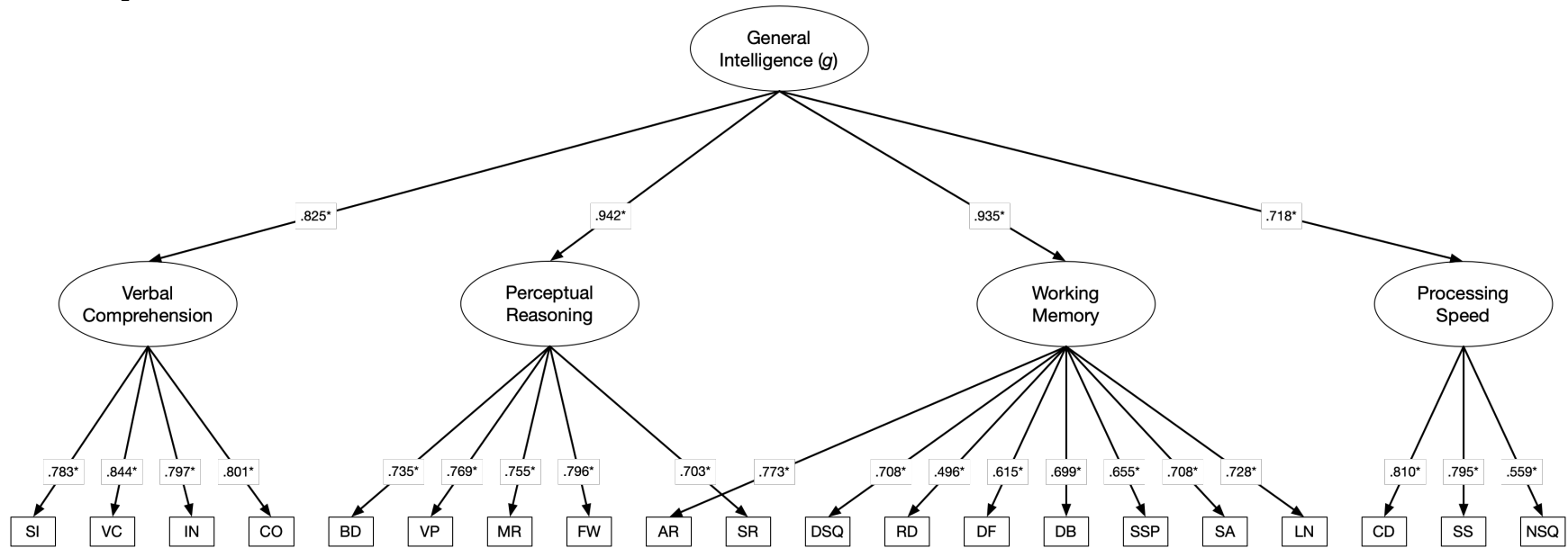
Figure 6A  
 WAIS-5 Subtest and Composite Score Variance Sources for Bifactor Model 4b<sub>1</sub>



Note. The Y-axis displays total variance for subtests and explained common variance for composite scores.

Figure 7A  
 WAIS-5 Higher-Order Model 4h<sub>2</sub> with Four Group Factors

Model 4h<sub>2</sub>



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ .

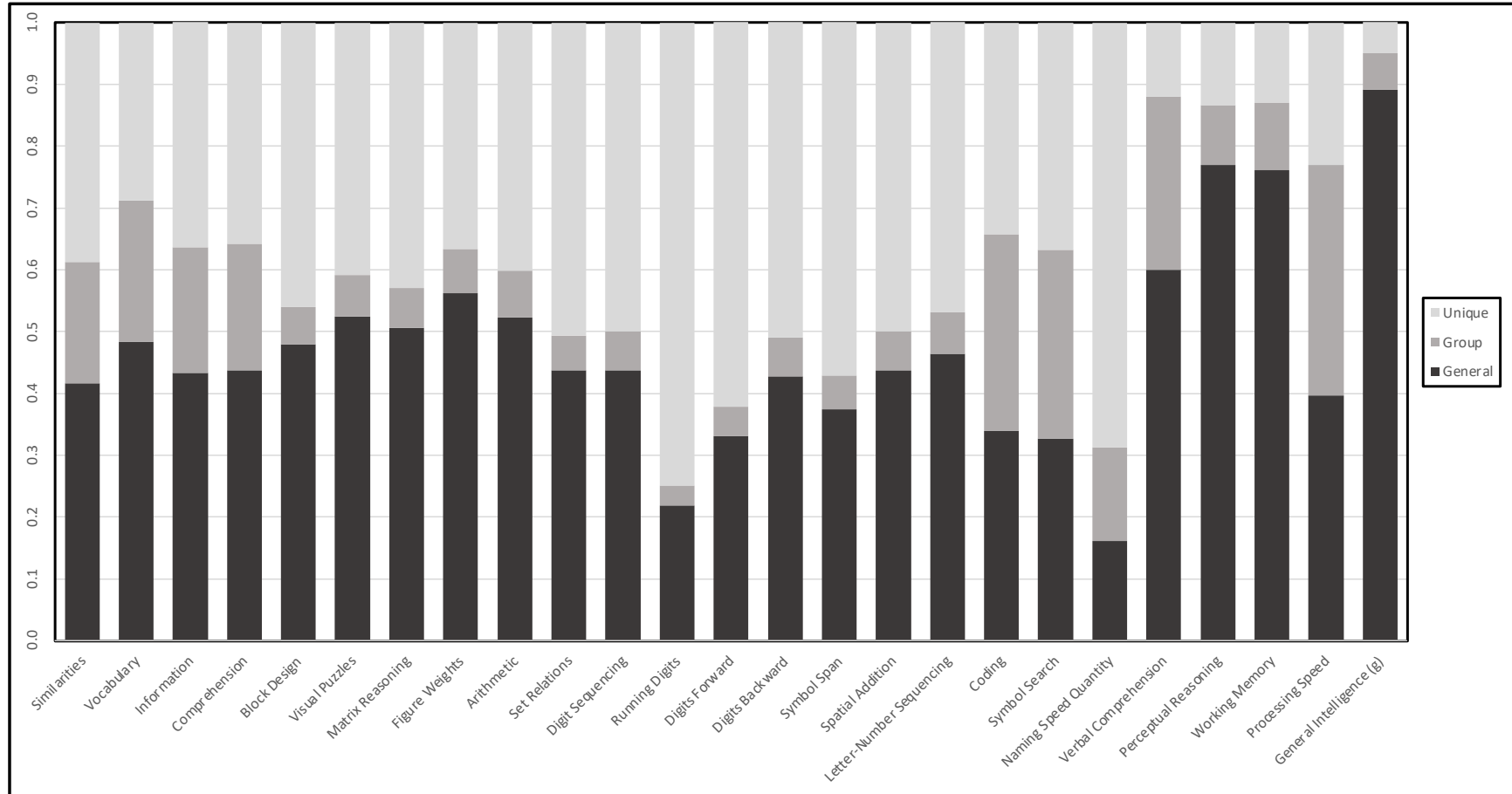
**Table 4A**

Sources of Variance in the Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) 20 Subtests According to a Schmid-Leiman Orthogonalized Higher-Order Factor Model (4 $h_2$ ) with Four First-Order (Group) Factors for the Total Standardization Sample ( $N = 2,020$ )

WAIS–5 Subtest	General		Verbal Comprehension		Perceptual Reasoning		Working Memory		Processing Speed		$h^2$	$u^2$	ECV
	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$			
Similarities	.646	.417	.442	.195							.613	.387	.681
Vocabulary	.696	.484	.477	.228							.712	.288	.680
Information	.658	.433	.450	.203							.635	.365	.681
Comprehension	.661	.437	.453	.205							.642	.358	.680
Block Design	.692	.479			.247	.061					.540	.460	.887
Visual Puzzles	.724	.524			.258	.067					.591	.409	.887
Matrix Reasoning	.711	.506			.253	.064					.570	.430	.888
Figure Weights	.750	.562			.267	.071					.634	.366	.888
Arithmetic	.723	.523					.274	.075			.598	.402	.874
Set Relations	.662	.438			.236	.056					.494	.506	.887
Digit Sequencing	.662	.438					.251	.063			.501	.499	.874
Running Digits	.468	.219					.178	.032			.251	.749	.874
Digits Forward	.575	.331					.218	.048			.378	.622	.874
Digits Backward	.654	.428					.248	.062			.489	.511	.874
Symbol Span	.612	.375					.232	.054			.428	.572	.874
Spatial Addition	.662	.438					.251	.063			.501	.499	.874
Letter-Number Sequencing	.681	.464					.258	.067			.530	.470	.874
Coding	.582	.339							.564	.318	.657	.343	.516
Symbol Search	.571	.326							.553	.306	.632	.368	.516
Naming Speed Quantity	.401	.161							.389	.151	.312	.688	.515
Total Variance		.416		.042		.016		.023		.039	.561	.439	
ECV		.777		.078		.030		.043		.072			
$\omega$		.949		.882		.867		.870		.770			
$\omega_H/\omega_{HS}$		.891		.281		.098		.109		.373			
Relative $\omega$		.938		.319		.113		.126		.484			
Factor Correlation		.944		.530		.312		.331		.611			
$H$		.938		.512		.254		.330		.520			
PUC		.753											
FDI		.969		.716		.504		.574		.721			

Note.  $b$  = standardized loading of subtest on factor,  $S^2$  = variance explained,  $h^2$  = communality,  $u^2$  = uniqueness, ECV = explained common variance,  $\omega$  = Omega,  $\omega_H$  = Omega-hierarchical (general factor),  $\omega_{HS}$  = Omega-hierarchical subscale (group factors),  $H$  = construct reliability index, PUC = percentage of uncontaminated correlations, FDI = factor determinacy index. Light shaded cells indicate minimum standard met; dark shaded cells indicate preferred/desired standard met.

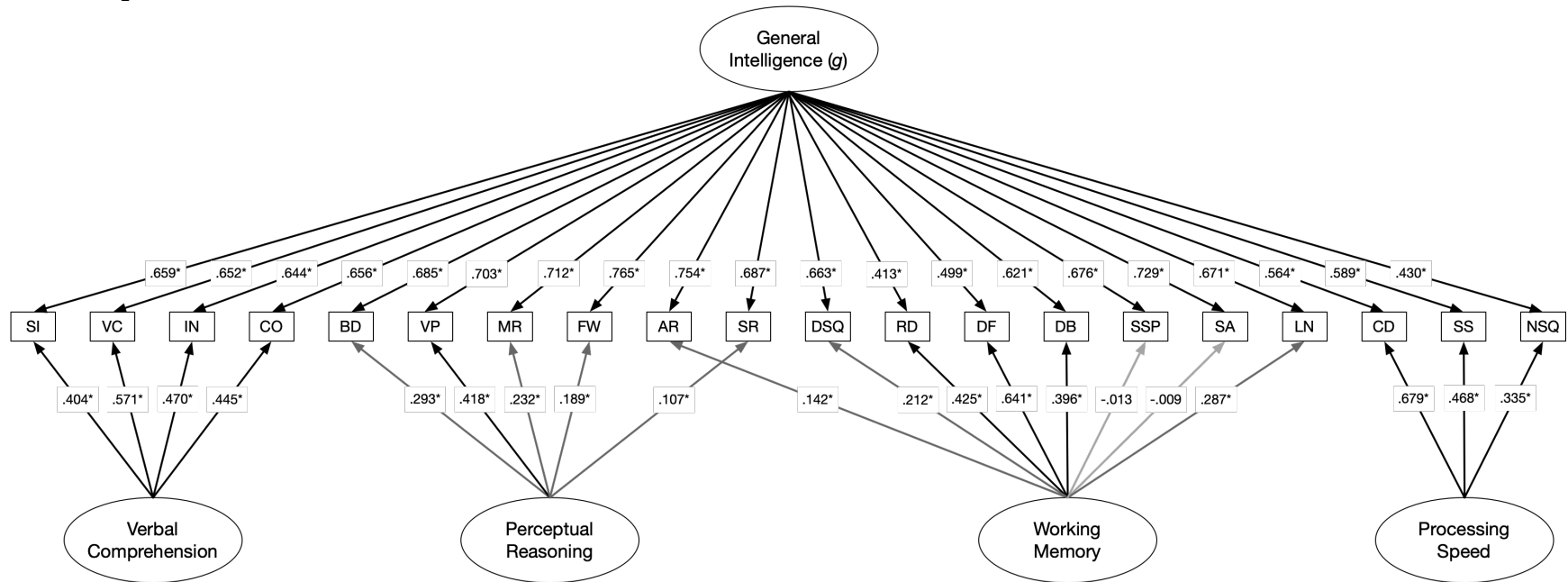
Figure 8A  
 WAIS-5 Subtest and Composite Score Variance Sources for Higher-Order Model 4h<sub>2</sub>



Note. The Y-axis displays total variance for subtests and explained common variance for composite scores.

Figure 9A  
 WAIS-5 Bifactor Model 4b<sub>2</sub> with Four Group Factors

Model 4b<sub>2</sub>



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ . Light shaded paths reflect statistically non-significant coefficients.

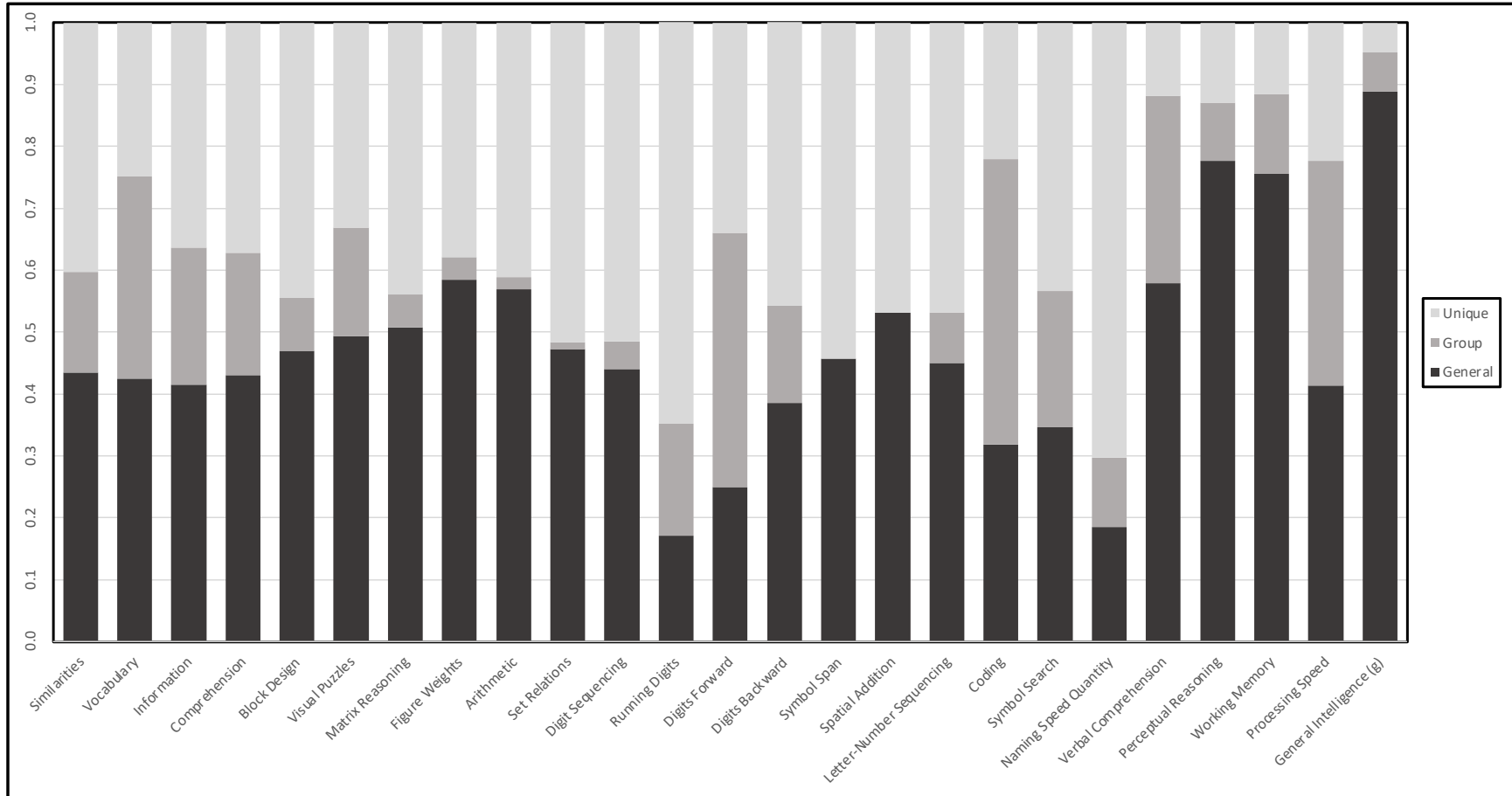
**Table 5A**

Sources of Variance in the Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) 20 Subtests According to a Bifactor Model (4b<sub>2</sub>) with Four First–Order (Group) Factors for the Total Standardization Sample (N = 2,020)

WAIS–5 Subtest	General		Verbal Comprehension		Perceptual Reasoning		Working Memory		Processing Speed		$h^2$	$u^2$	ECV
	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$			
Similarities	.659	.434	.404	.163							.597	.403	.727
Vocabulary	.652	.425	.571	.326							.751	.249	.566
Information	.644	.415	.470	.221							.636	.364	.652
Comprehension	.656	.430	.445	.198							.628	.372	.685
Block Design	.685	.469			.293	.086					.555	.445	.845
Visual Puzzles	.703	.494			.418	.175					.669	.331	.739
Matrix Reasoning	.712	.507			.232	.054					.561	.439	.904
Figure Weights	.765	.585			.189	.036					.621	.379	.942
Arithmetic	.754	.569					.142	.020			.589	.411	.966
Set Relations	.687	.472			.107	.011					.483	.517	.976
Digit Sequencing	.663	.440					.212	.045			.485	.515	.907
Running Digits	.413	.171					.425	.181			.351	.649	.486
Digits Forward	.499	.249					.641	.411			.660	.340	.377
Digits Backward	.621	.386					.396	.157			.542	.458	.711
Symbol Span	.676	.457					-.013	.000			.457	.543	.999
Spatial Addition	.729	.531					-.009	.000			.532	.468	.999
Letter-Number Sequencing	.671	.450					.287	.082			.533	.467	.845
Coding	.564	.318							.679	.461	.779	.221	.408
Symbol Search	.589	.347							.468	.219	.566	.434	.613
Naming Speed Quantity	.430	.185							.335	.112	.297	.703	.622
Total Variance		.417		.045		.018		.045		.040	.565	.435	
ECV		.738		.080		.032		.079		.070			
$\omega$		.953		.882		.870		.885		.776			
$\omega_H/\omega_{HS}$		.889		.303		.094		.129		.362			
Relative $\omega$		.933		.344		.108		.146		.467			
Factor Correlation		.943		.551		.307		.360		.602			
$H$		.939		.547		.291		.558		.558			
PUC		.753											
FDI		.969		.740		.540		.747		.747			

Note.  $b$  = standardized loading of subtest on factor,  $S^2$  = variance explained,  $h^2$  = communality,  $u^2$  = uniqueness, ECV = explained common variance,  $\omega$  = Omega,  $\omega_H$  = Omega-hierarchical (general factor),  $\omega_{HS}$  = Omega-hierarchical subscale (group factors),  $H$  = construct reliability index, PUC = percentage of uncontaminated correlations, FDI = factor determinacy index. Light shaded cells indicate minimum standard met; dark shaded cells indicate preferred/desired standard met.

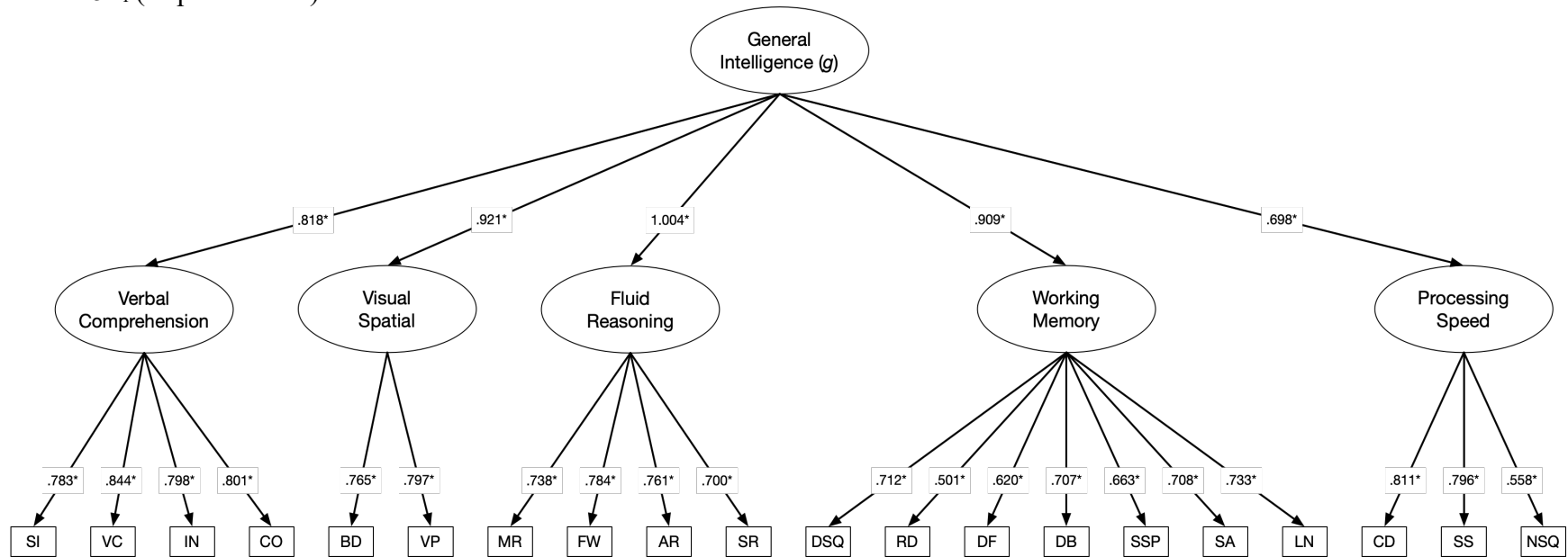
Figure 10A  
 WAIS-5 Subtest and Composite Score Variance Sources for Bifactor Model 4b<sub>2</sub>



Note. The Y-axis displays total variance for subtests and explained common variance for composite scores.

Figure 11A  
 WAIS-5 Higher-Order Model 5h<sub>1</sub> with Five Group Factors (Impermissible)

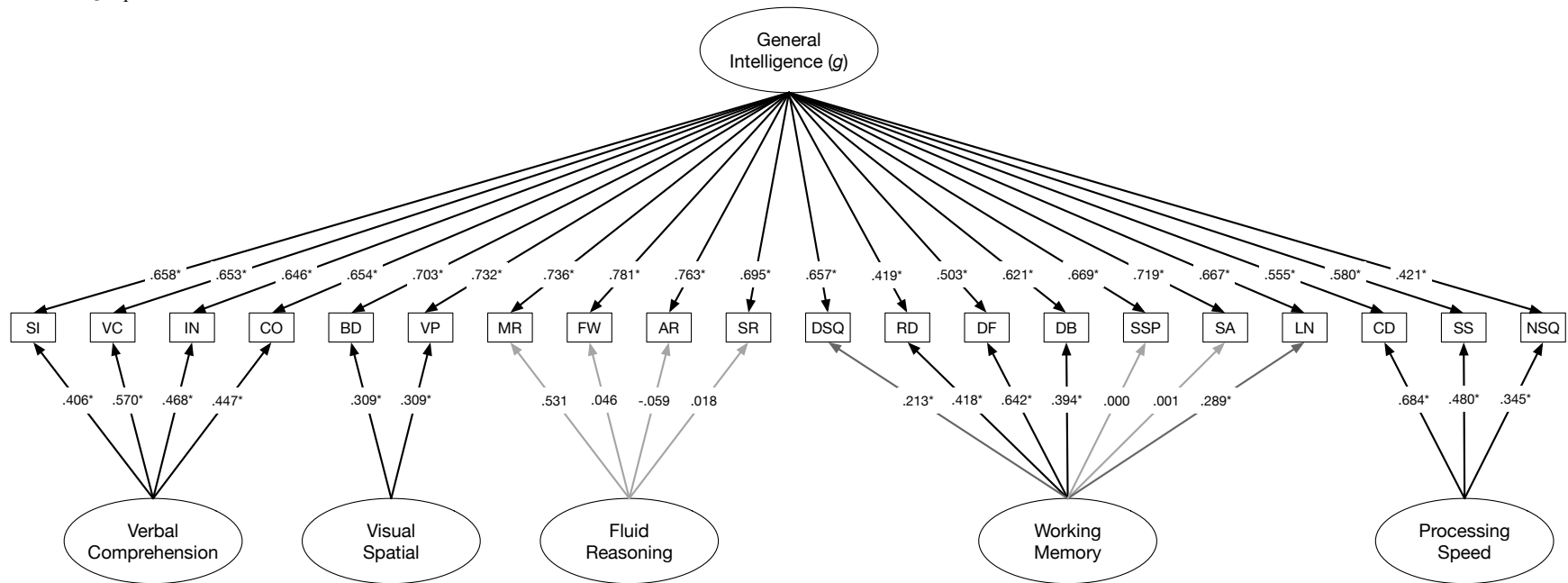
Model 5h<sub>1</sub> (Impermissible)



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ .

Figure 12A  
 WAIS-5 Bifactor Model 5b<sub>1</sub> with Five Group Factors

Model 5b<sub>1</sub>



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ . Light shaded paths reflect statistically non-significant coefficients.

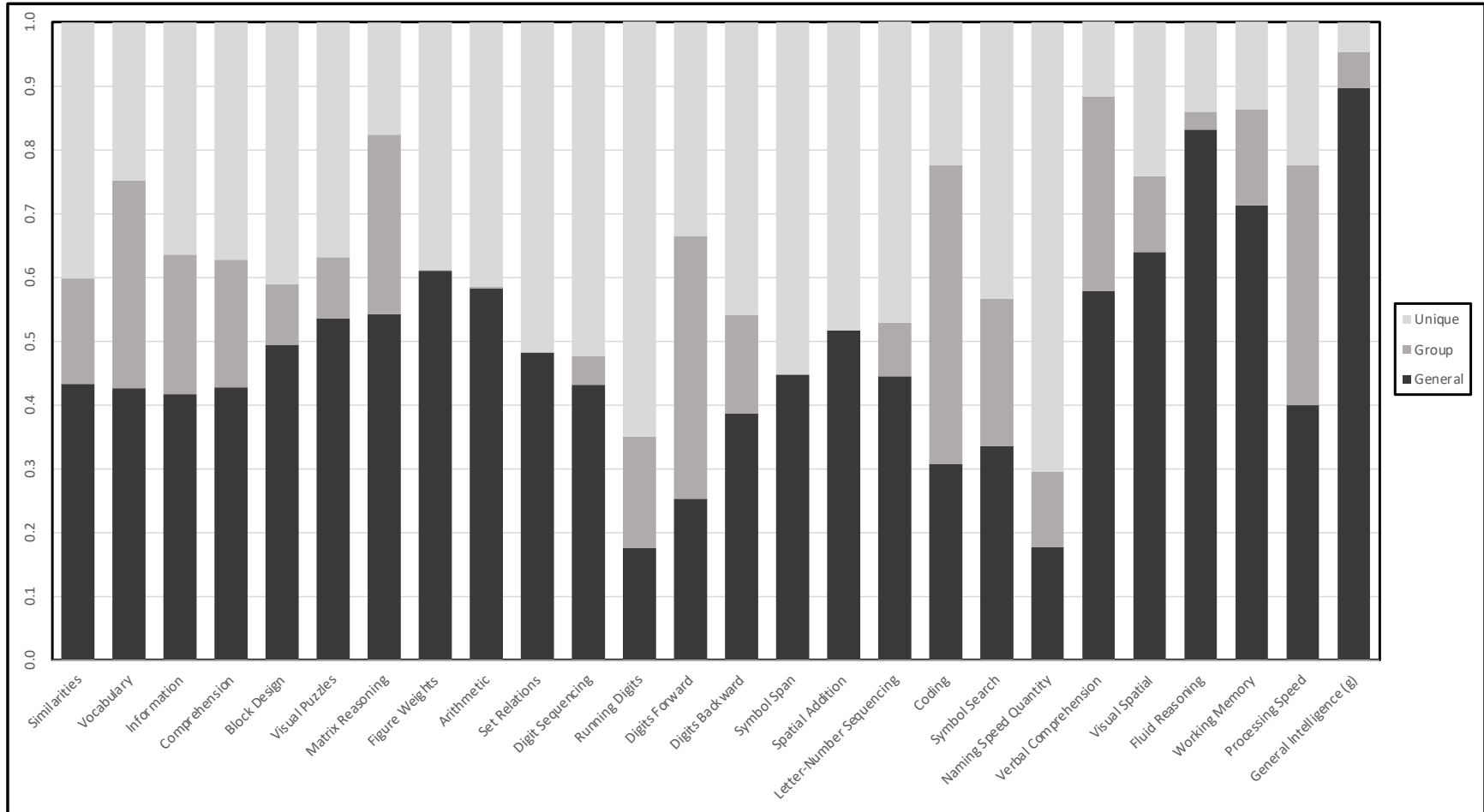
Table 6A

Sources of Variance in the Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) 20 Subtests According to a Bifactor Model ( $5b_1$ ) with Five First–Order (Group) Factors for the Total Standardization Sample ( $N = 2,020$ )

WAIS–5 Subtest	General		VC		VS		FR		WM		PS		$h^2$	$u^2$	ECV
	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$			
Similarities	.658	.433	.406	.165									.598	.402	.724
Vocabulary	.653	.426	.570	.325									.751	.249	.568
Information	.646	.417	.468	.219									.636	.364	.656
Comprehension	.654	.428	.447	.200									.628	.372	.682
Block Design	.703	.494			.309	.095							.590	.410	.838
Visual Puzzles	.732	.536			.309	.095							.631	.369	.849
Matrix Reasoning	.736	.542					.531	.282					.824	.176	.658
Figure Weights	.781	.610					.046	.002					.612	.388	.997
Arithmetic	.763	.582					-.059	.003					.586	.414	.994
Set Relations	.695	.483					.018	.000					.483	.517	.999
Digit Sequencing	.657	.432							.213	.045			.477	.523	.905
Running Digits	.419	.176							.418	.175			.350	.650	.501
Digits Forward	.503	.253							.642	.412			.665	.335	.380
Digits Backward	.621	.386							.394	.155			.541	.459	.713
Symbol Span	.669	.448							.000	.000			.448	.552	.999
Spatial Addition	.719	.517							.001	.000			.517	.483	.999
Letter-Number Seq.	.667	.445							.289	.084			.528	.472	.842
Coding	.555	.308									.684	.468	.776	.224	.397
Symbol Search	.580	.336									.480	.230	.567	.433	.594
Naming Speed Quant.	.421	.177									.345	.119	.296	.704	.598
Total Variance		.421		.045		.010		.014		.044		.041	.575	.425	
ECV		.733		.079		.017		.025		.076		.071			
$\omega$		.954		.882		.758		.859		.863		.775			
$\omega_H/\omega_{HS}$		.897		.304		.119		.027		.151		.376			
Relative $\omega$		.941		.344		.156		.031		.175		.485			
Factor Correlation		.947		.551		.344		.164		.388		.613			
$H$		.941		.547		.174		.285		.553		.568			
PUC		.805													
FDI		.970		.740		.418		.534		.743		.754			

Note. VC = Verbal Comprehension, VS = Visual Spatial, FR = Fluid Reasoning, WM = Working Memory, PS = Processing Speed, Seq. = Sequencing, Quant. = Quantity,  $b$  = standardized loading of subtest on factor,  $S^2$  = variance explained,  $h^2$  = communality,  $u^2$  = uniqueness, ECV = explained common variance,  $\omega$  = Omega,  $\omega_H$  = Omega-hierarchical (general factor),  $\omega_{HS}$  = Omega-hierarchical subscale (group factors),  $H$  = construct reliability index, PUC = percentage of uncontaminated correlations, FDI = factor determinacy index. Light shaded cells indicate minimum standard met; dark shaded cells indicate preferred/desired standard met.

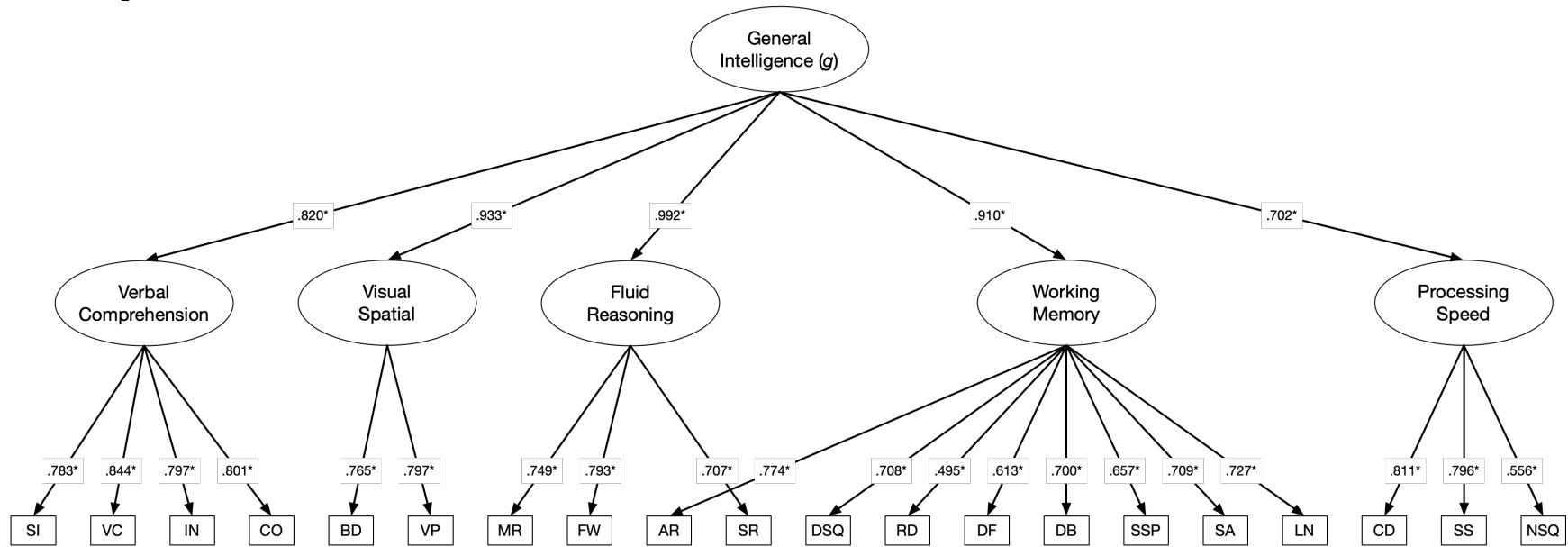
Figure 13A  
 WAIS-5 Subtest and Composite Score Variance Sources for Bifactor Model 5b<sub>1</sub>



Note. The Y-axis displays total variance for subtests and explained common variance for composite scores.

Figure 14A  
 WAIS-5 Higher-Order Model 5h<sub>2</sub> with Five Group Factors

Model 5h<sub>2</sub>



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ .

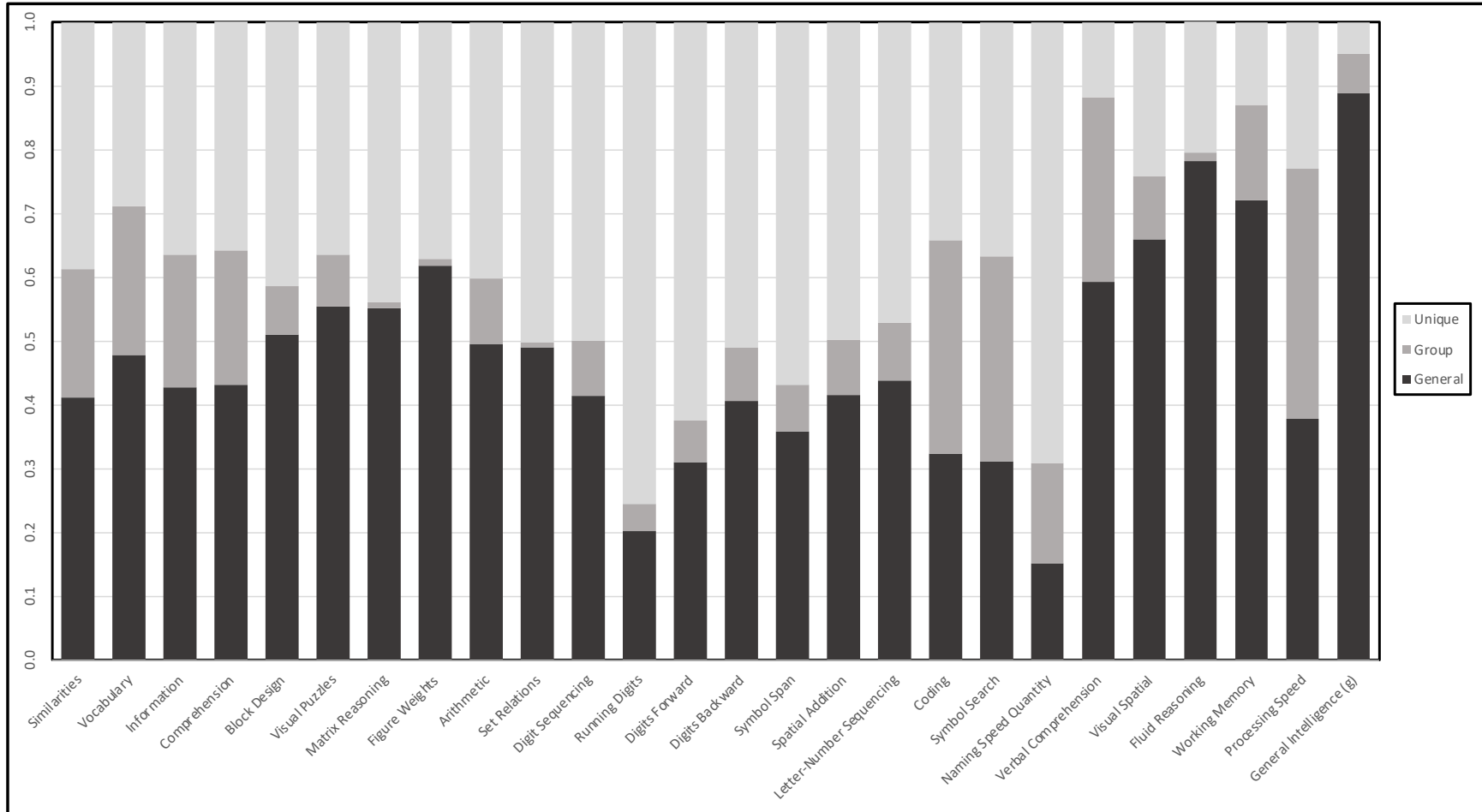
Table 7A

Sources of Variance in the Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) 20 Subtests According to a Schmid-Leiman Orthogonalized Higher-Order Factor Model ( $5h_2$ ) with Five First-Order (Group) Factors for the Total Standardization Sample ( $N = 2,020$ )

WAIS–5 Subtest	General		VC		VS		FR		WM		PS		$h^2$	$u^2$	ECV
	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$			
Similarities	.642	.412	.448	.201									.613	.387	.673
Vocabulary	.692	.479	.483	.233									.712	.288	.672
Information	.654	.428	.456	.208									.636	.364	.673
Comprehension	.657	.432	.458	.210									.641	.359	.673
Block Design	.714	.510			.275	.076							.585	.415	.871
Visual Puzzles	.744	.554			.287	.082							.636	.364	.870
Matrix Reasoning	.743	.552					.095	.009					.561	.439	.984
Figure Weights	.787	.619					.100	.010					.629	.371	.984
Arithmetic	.704	.496							.321	.103			.599	.401	.828
Set Relations	.701	.491					.089	.008					.499	.501	.984
Digit Sequencing	.644	.415							.294	.086			.501	.499	.828
Running Digits	.450	.203							.205	.042			.245	.755	.828
Digits Forward	.558	.311							.254	.065			.376	.624	.828
Digits Backward	.637	.406							.290	.084			.490	.510	.828
Symbol Span	.598	.358							.272	.074			.432	.568	.829
Spatial Addition	.645	.416							.294	.086			.502	.498	.828
Letter-Number Seq.	.662	.438							.301	.091			.529	.471	.829
Coding	.569	.324									.578	.334	.658	.342	.492
Symbol Search	.559	.312									.567	.321	.634	.366	.493
Naming Speed Quant.	.390	.152									.396	.157	.309	.691	.492
Total Variance		.415		.043		.008		.001		.032		.041	.539	.461	
ECV		.770		.079		.015		.002		.059		.075			
$\omega$		.950		.882		.758		.794		.870		.770			
$\omega_H/\omega_{HS}$		.889		.289		.098		.013		.149		.391			
Relative $\omega$		.936		.327		.129		.016		.172		.508			
Factor Correlation		.943		.537		.313		.113		.387		.625			
$H$		.939		.520		.146		.026		.408		.537			
PUC		.784													
FDI		.969		.721		.383		.163		.639		.733			

Note. VC = Verbal Comprehension, VS = Visual Spatial, FR = Fluid Reasoning, WM = Working Memory, PS = Processing Speed, Seq. = Sequencing, Quant. = Quantity,  $b$  = standardized loading of subtest on factor,  $S^2$  = variance explained,  $h^2$  = communality,  $u^2$  = uniqueness, ECV = explained common variance,  $\omega$  = Omega,  $\omega_H$  = Omega-hierarchical (general factor),  $\omega_{HS}$  = Omega-hierarchical subscale (group factors),  $H$  = construct reliability index, PUC = percentage of uncontaminated correlations, FDI = factor determinacy index. Light shaded cells indicate minimum standard met; dark shaded cells indicate preferred/desired standard met.

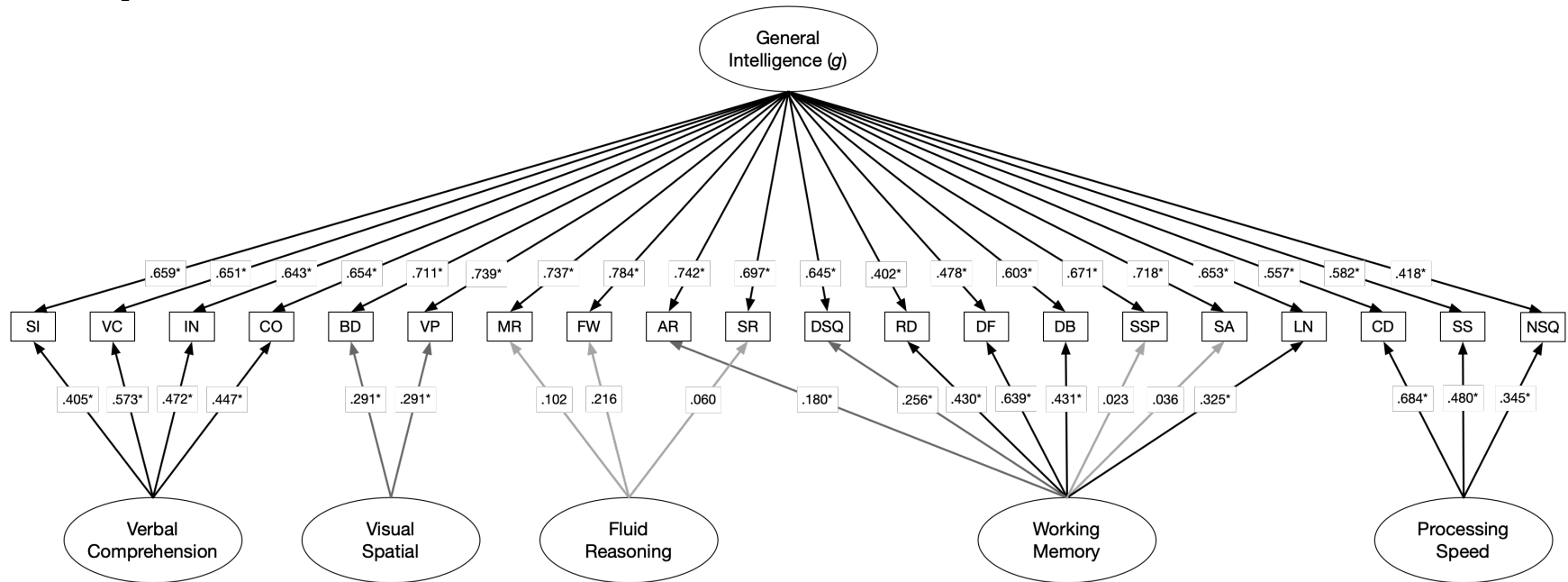
Figure 15A  
 WAIS-5 Subtest and Composite Score Variance Sources for Higher-Order Model 5h<sub>2</sub>



Note. The Y-axis displays total variance for subtests and explained common variance for composite scores.

Figure 16A  
 WAIS-5 Bifactor Model 5b<sub>2</sub> with Five Group Factors

Model 5b<sub>2</sub>



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ . Light shaded paths reflect statistically non-significant coefficients.

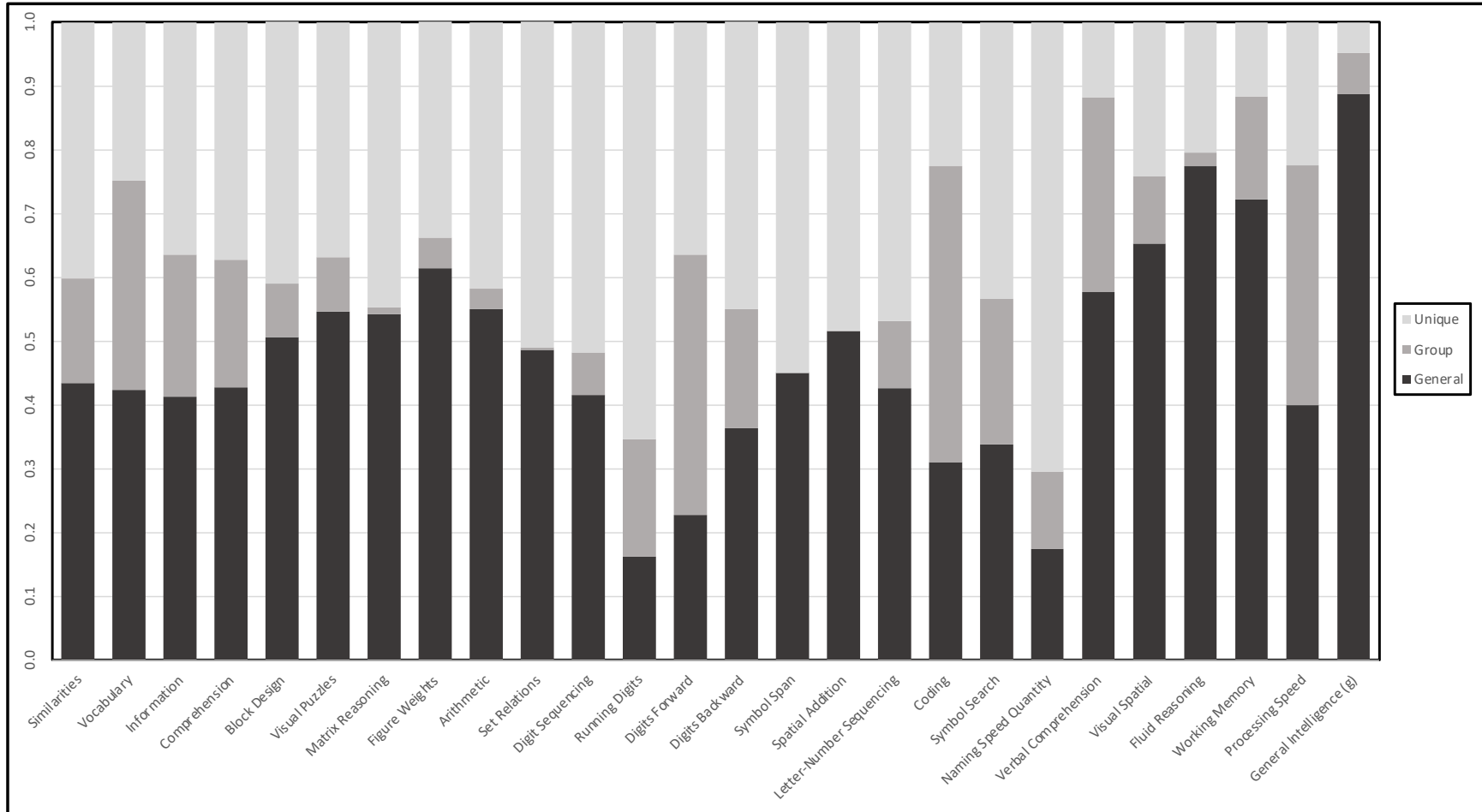
Table 8A

Sources of Variance in the Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) 20 Subtests According to a Bifactor Model (5b<sub>2</sub>) with Five First–Order (Group) Factors for the Total Standardization Sample (N = 2,020)

WAIS–5 Subtest	General		VC		VS		FR		WM		PS		$h^2$	$u^2$	ECV
	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$			
Similarities	.659	.434	.405	.164									.598	.402	.726
Vocabulary	.651	.424	.573	.328									.752	.248	.563
Information	.643	.413	.472	.223									.636	.364	.650
Comprehension	.654	.428	.447	.200									.628	.372	.682
Block Design	.711	.506			.291	.085							.590	.410	.857
Visual Puzzles	.739	.546			.291	.085							.631	.369	.866
Matrix Reasoning	.737	.543					.102	.010					.554	.446	.981
Figure Weights	.784	.615					.216	.047					.661	.339	.929
Arithmetic	.742	.551							.180	.032			.583	.417	.944
Set Relations	.697	.486					.060	.004					.489	.511	.993
Digit Sequencing	.645	.416							.256	.066			.482	.518	.864
Running Digits	.402	.162							.430	.185			.347	.653	.466
Digits Forward	.478	.228							.639	.408			.637	.363	.359
Digits Backward	.603	.364							.431	.186			.549	.451	.662
Symbol Span	.671	.450							.023	.001			.451	.549	.999
Spatial Addition	.718	.516							.036	.001			.517	.483	.997
Letter-Number Seq.	.653	.426							.325	.106			.532	.468	.801
Coding	.557	.310									.681	.464	.774	.226	.401
Symbol Search	.582	.339									.478	.228	.567	.433	.597
Naming Speed Quant.	.418	.175									.348	.121	.296	.704	.591
Total Variance		.417		.046		.008		.003		.049		.041	.564	.436	
ECV		.739		.081		.015		.005		.087		.072			
$\omega$		.952		.882		.758		.796		.883		.775			
$\omega_H/\omega_{HS}$		.888		.305		.105		.022		.161		.375			
Relative $\omega$		.933		.346		.139		.028		.182		.484			
Factor Correlation		.942		.553		.324		.150		.401		.612			
$H$		.940		.550		.156		.059		.578		.565			
PUC		.784													
FDI		.970		.742		.395		.244		.760		.752			

Note. VC = Verbal Comprehension, VS = Visual Spatial, FR = Fluid Reasoning, WM = Working Memory, PS = Processing Speed, Seq. = Sequencing, Quant. = Quantity,  $b$  = standardized loading of subtest on factor,  $S^2$  = variance explained,  $h^2$  = communality,  $u^2$  = uniqueness, ECV = explained common variance,  $\omega$  = Omega,  $\omega_H$  = Omega-hierarchical (general factor),  $\omega_{HS}$  = Omega-hierarchical subscale (group factors),  $H$  = construct reliability index, PUC = percentage of uncontaminated correlations, FDI = factor determinacy index. Light shaded cells indicate minimum standard met; dark shaded cells indicate preferred/desired standard met.

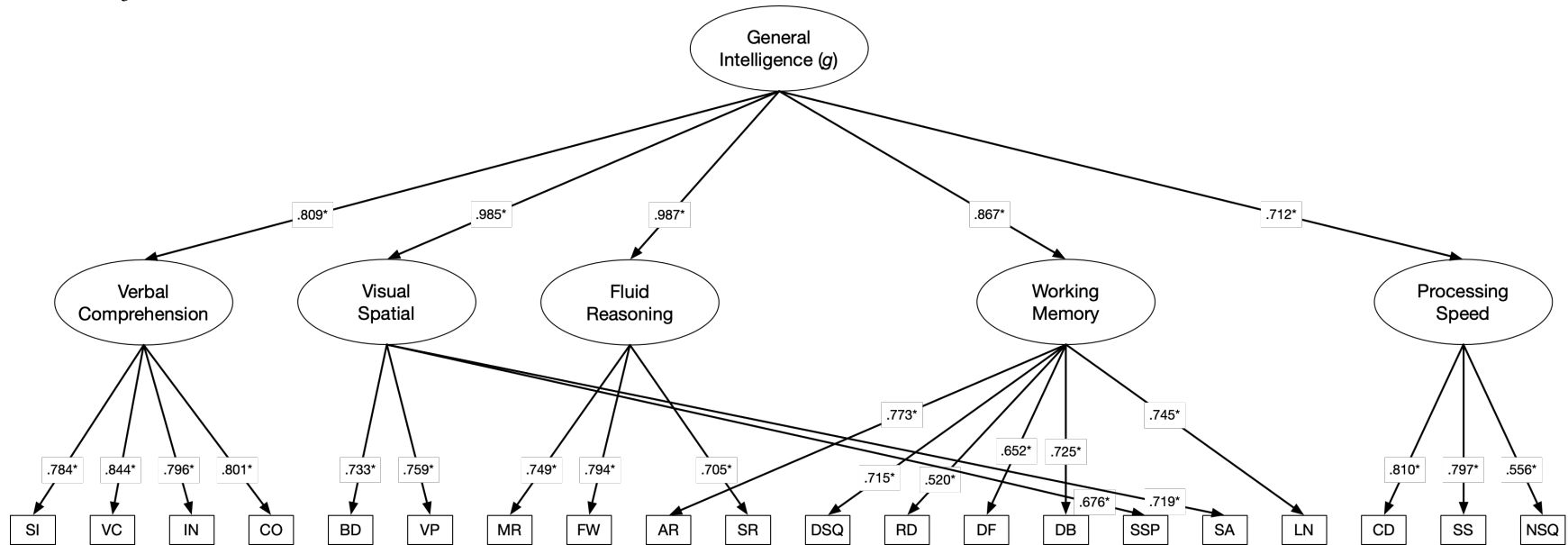
Figure 17A  
 WAIS-5 Subtest and Composite Score Variance Sources for Bifactor Model 5b<sub>2</sub>



Note. The Y-axis displays total variance for subtests and explained common variance for composite scores.

Figure 18A  
 WAIS-5 Higher-Order Model 5h<sub>3</sub> with Five Group Factors

Model 5h<sub>3</sub>



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ .

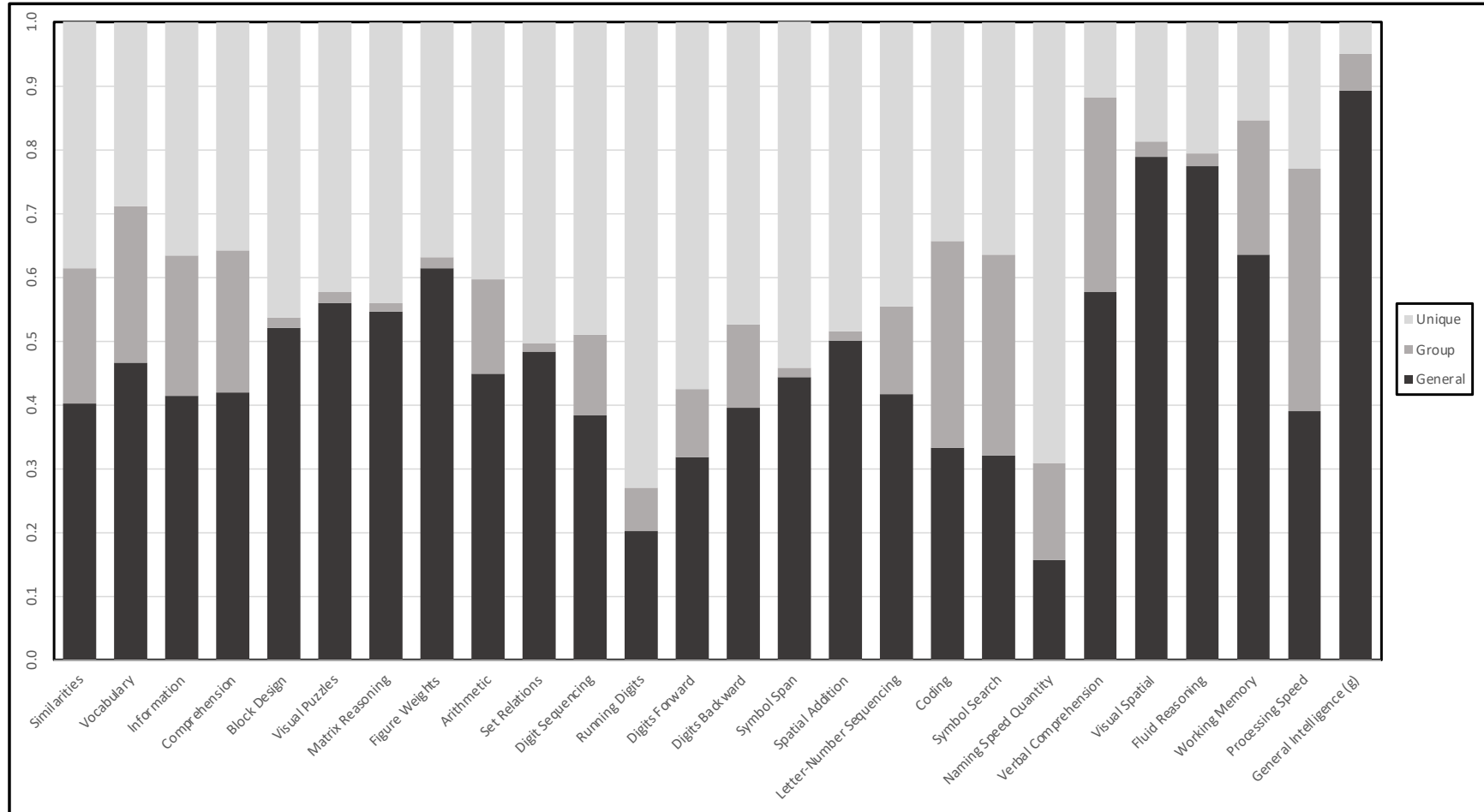
Table 9A

Sources of Variance in the Wechsler Adult Intelligence Scale–Fifth Edition (WAIS–5) 20 Subtests According to a Schmid-Leiman Orthogonalized Higher-Order Factor Model ( $5h_3$ ) with Five First-Order (Group) Factors for the Total Standardization Sample ( $N = 2,020$ )

WAIS–5 Subtest	General		VC		VS		FR		WM		PS		$h^2$	$u^2$	ECV
	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$	$b$	$S^2$			
Similarities	.634	.402	.461	.213									.614	.386	.654
Vocabulary	.683	.466	.496	.246									.713	.287	.655
Information	.644	.415	.468	.219									.634	.366	.654
Comprehension	.648	.420	.471	.222									.642	.358	.654
Block Design	.722	.521			.126	.016							.537	.463	.970
Visual Puzzles	.748	.560			.131	.017							.577	.423	.970
Matrix Reasoning	.739	.546					.120	.014					.561	.439	.974
Figure Weights	.784	.615					.128	.016					.631	.369	.974
Arithmetic	.670	.449							.385	.148			.597	.403	.752
Set Relations	.696	.484					.113	.013					.497	.503	.974
Digit Sequencing	.620	.384							.356	.127			.511	.489	.752
Running Digits	.451	.203							.259	.067			.270	.730	.752
Digits Forward	.565	.319							.325	.106			.425	.575	.751
Digits Backward	.629	.396							.361	.130			.526	.474	.752
Symbol Span	.666	.444			.117	.014							.457	.543	.970
Spatial Addition	.708	.501			.124	.015							.517	.483	.970
Letter-Number Seq.	.646	.417							.371	.138			.555	.445	.752
Coding	.577	.333									.569	.324	.657	.343	.507
Symbol Search	.567	.321									.560	.314	.635	.365	.506
Naming Speed Quant.	.396	.157									.390	.152	.309	.691	.508
Total Variance		.418		.045		.003		.002		.036		.039	.543	.457	
ECV		.769		.083		.006		.004		.066		.073			
$\omega$		.950		.882		.813		.794		.846		.770			
$\omega_H/\omega_{HS}$		.893		.305		.024		.020		.210		.380			
Relative $\omega$		.940		.346		.030		.026		.248		.493			
Factor Correlation		.945		.552		.156		.143		.458		.616			
$H$		.940		.537		.059		.042		.450		.527			
PUC		.826													
FDI		.969		.733		.244		.206		.671		.726			

Note. VC = Verbal Comprehension, VS = Visual Spatial, FR = Fluid Reasoning, WM = Working Memory, PS = Processing Speed, Seq. = Sequencing, Quant. = Quantity,  $b$  = standardized loading of subtest on factor,  $S^2$  = variance explained,  $h^2$  = communality,  $u^2$  = uniqueness, ECV = explained common variance,  $\omega$  = Omega,  $\omega_H$  = Omega-hierarchical (general factor),  $\omega_{HS}$  = Omega-hierarchical subscale (group factors),  $H$  = construct reliability index, PUC = percentage of uncontaminated correlations, FDI = factor determinacy index. Light shaded cells indicate minimum standard met; dark shaded cells indicate preferred/desired standard met.

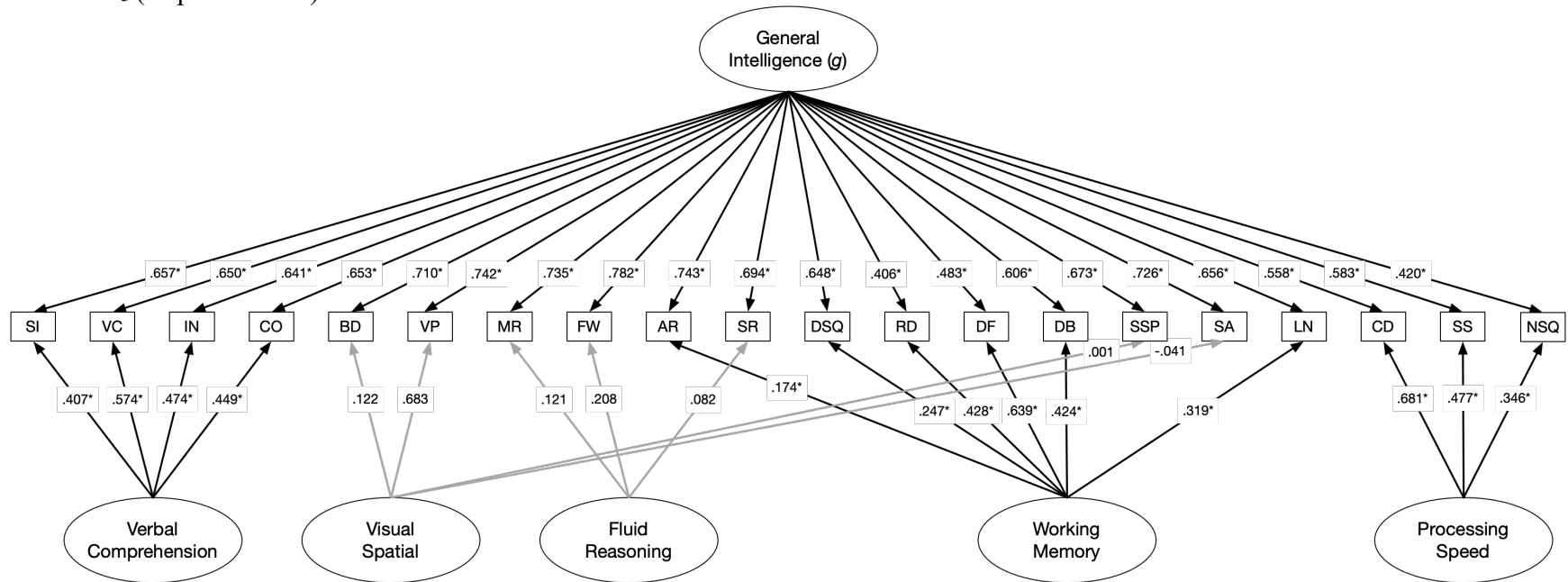
Figure 19A  
 WAIS-5 Subtest and Composite Score Variance Sources for Higher-Order Model 5h<sub>3</sub>



Note. The Y-axis displays total variance for subtests and explained common variance for composite scores.

Figure 20A  
 WAIS-5 Bifactor Model 5b<sub>3</sub> with Five Group Factors (Impermissible)

Model 5b<sub>3</sub> (Impermissible)



*Note.* SI = Similarities, VC = Vocabulary, IN = Information, CO = Comprehension, BD = Block Design, VP = Visual Puzzles, MR = Matrix Reasoning, FW = Figure Weights, AR = Arithmetic, SR = Set Relations, DSQ = Digit Sequencing, RD = Running Digits, DF = Digits Forward, DB = Digits Backward, SSP = Symbol Span, SA = Spatial Addition, LN = Letter-Number Sequencing, CD = Coding, SS = Symbol Search, NSQ = Naming Speed Quantity. \* $p < .05$ . Light shaded paths reflect statistically non-significant coefficients