

Cognitive Control among Primary- and Middle-School Students and Their Associations with Math Achievement

Supplemental Materials

The supplemental materials include the following: descriptive statistics of accuracy rates and RTs for all Stroop conflict tasks (Table S1); descriptive plots for the ANOVA (Figures S1-S8); distribution and scatter plots of reported correlations (Figures S9-S20); Fisher R to Z analysis between correlations of cognitive control measures and Raven score with math achievements between Age Groups (Table S2).

Table S1. Descriptive statistics of accuracy rates and RTs for all Stroop conflict tasks.

A. Descriptive Statistics Physical task in congruent and incongruent conditions: RT, Accuracy Rates

	Congruent RT		Congruent Accuracy		Incongruent RT		Incongruent Accuracy	
	Primary	Middle	Primary	Middle	Primary	Middle	Primary	Middle
Mean	621.30	513.06	99.14	98.85	651.92	537.80	97.98	97.45
Std. Deviation	118.89	70.11	1.97	2.30	128.71	80.87	3.21	3.38

B. Descriptive Statistics Numerical task in congruent and incongruent conditions: RT, Accuracy Rates

	Congruent RT		Congruent Accuracy		Incongruent RT		Incongruent Accuracy	
	Primary	Middle	Primary	Middle	Primary	Middle	Primary	Middle
Mean	815.81	694.42	98.54	98.49	927.67	781.80	88.26	89.11
Std. Deviation	162.97	120.02	2.31	2.19	184.14	132.56	10.13	8.13

C. Descriptive Statistics Location task in congruent and incongruent conditions: RT, Accuracy Rates

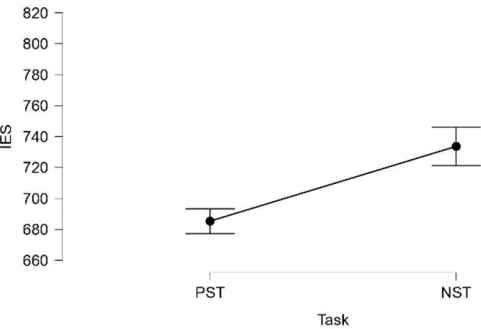
	Congruent RT		Congruent Accuracy		Incongruent RT		Incongruent Accuracy	
	Primary	Middle	Primary	Middle	Primary	Middle	Primary	Middle
Mean	591.46	555.72	96.9	95.9	624.00	583.24	93.5	92.9
Std. Deviation	128.02	128.26	3.7	4.4	138.27	145.46	5.9	6.6

D. Descriptive Statistics Direction task in congruent and incongruent conditions: RT, Accuracy Rates

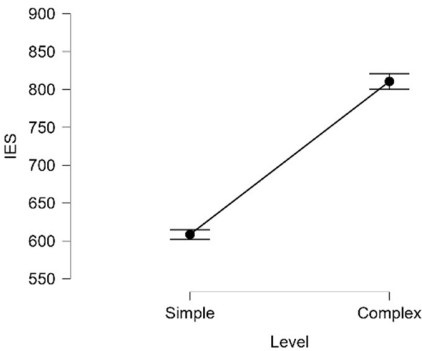
	Congruent RT		Congruent Accuracy		Incongruent RT		Incongruent Accuracy	
	Primary	Middle	Primary	Middle	Primary	Middle	Primary	Middle
Mean	684.27	615.16	96.4	96.0	765.69	664.61	88.0	89.5
Std. Deviation	162.22	111.23	4.2	4.9	162.11	102.39	10.2	11.8

Figures S1-S8: Descriptive plots for the ANOVA.

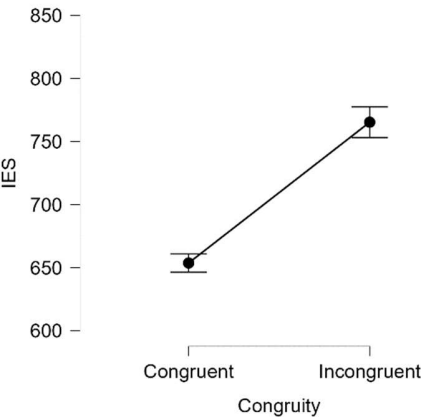
S1. Task



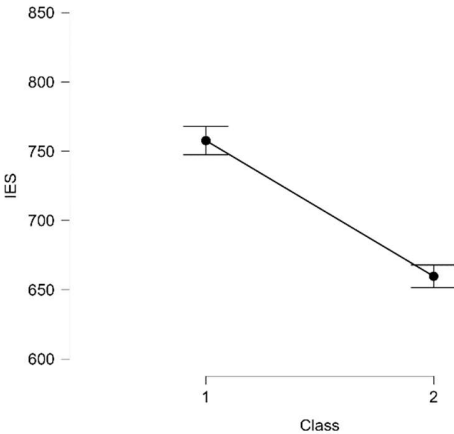
S2. Level



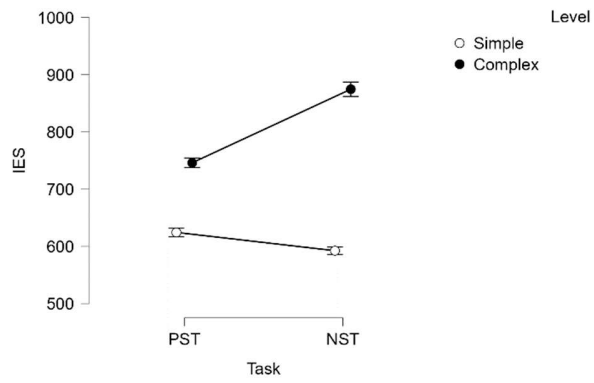
S3. Congruity



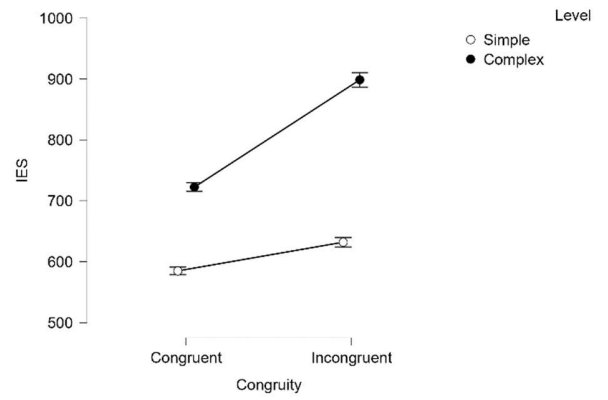
S4. Class



S5. Task X Level

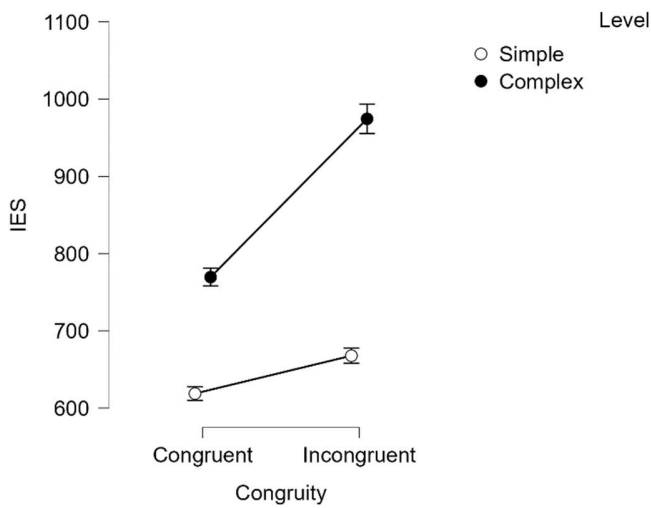


S6. Congruity X Level

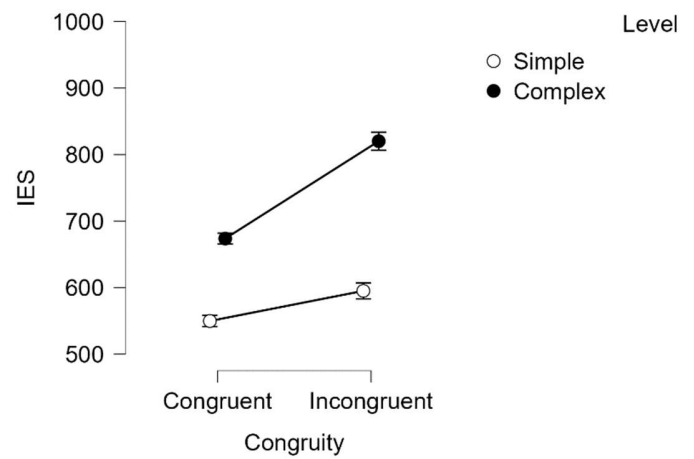


S7. Congruity X Level X Class

Class: Primary

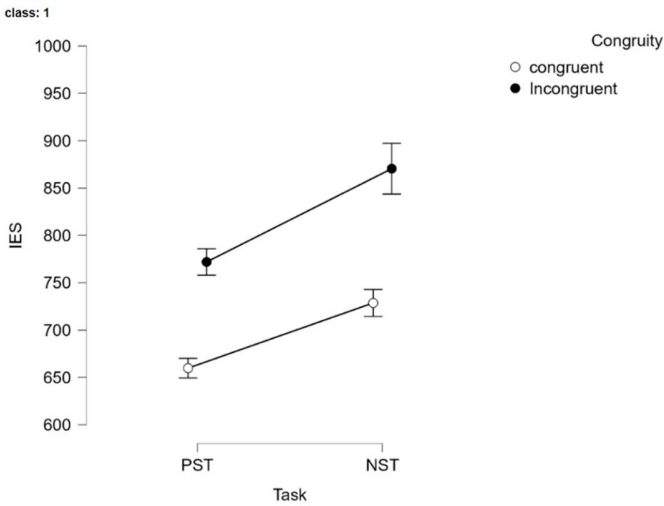


Middle

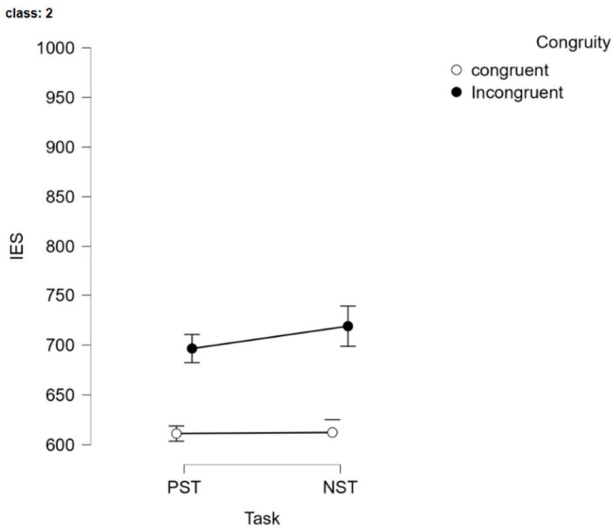


S8. Task X Congruity X Class

Class: Primary



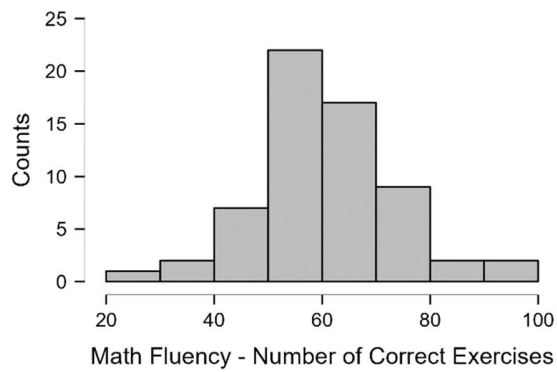
Middle



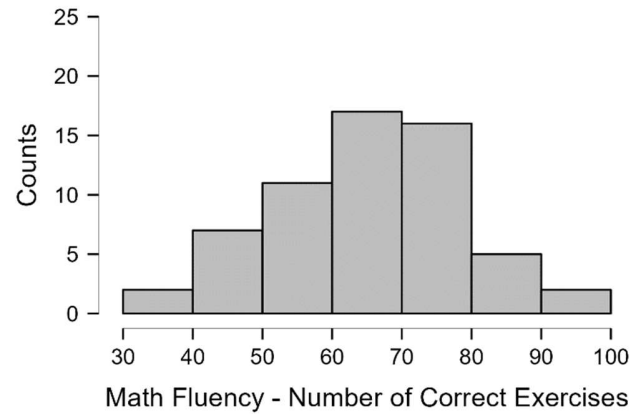
Figures S9-20: Distribution and scatter plots of reported correlations.

S9. Math Fluency – Number of exercises for primary and middle school students

Primary

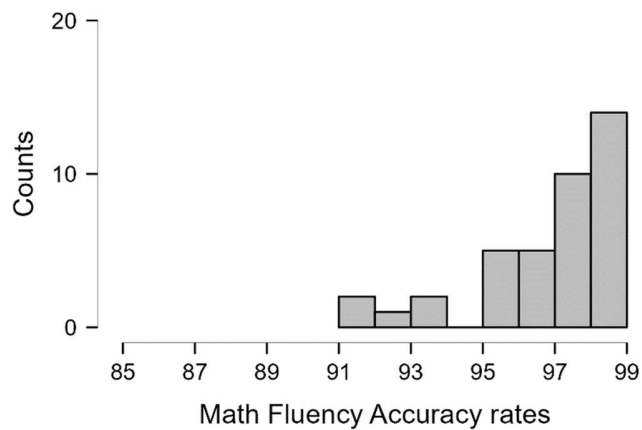


Middle

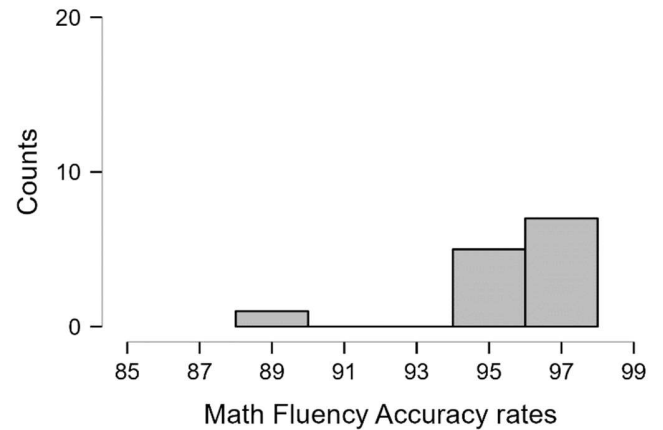


S10. Math Fluency – Accuracy rates for primary and middle school students

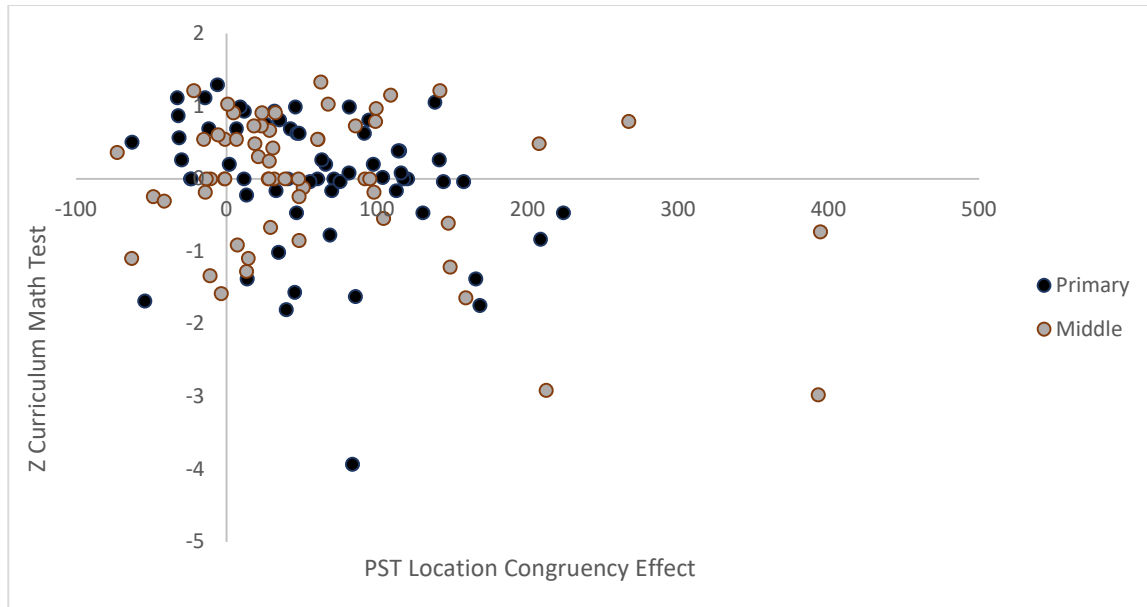
Primary



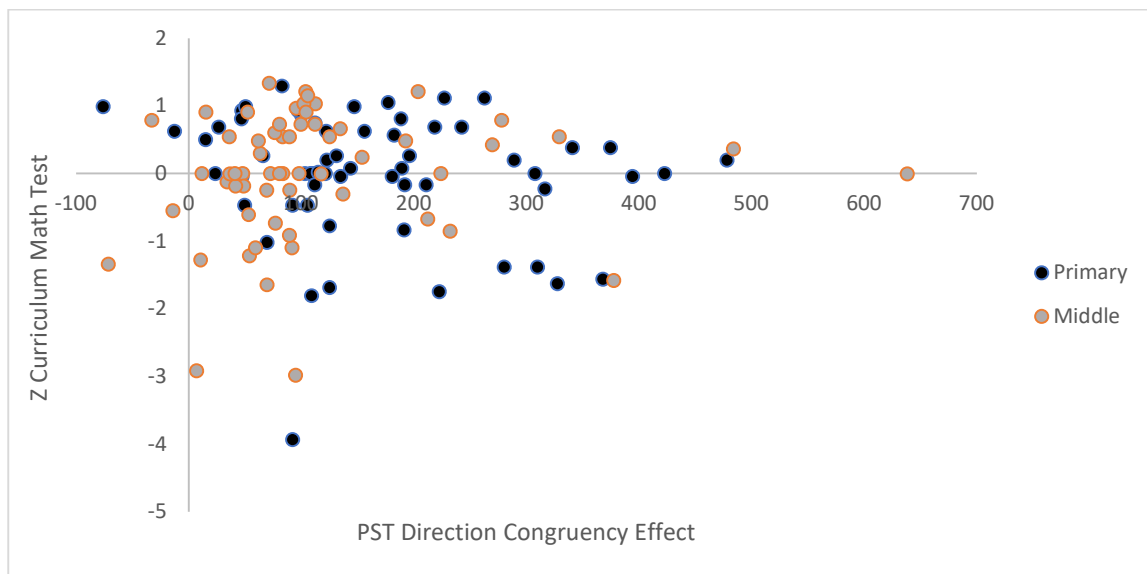
Middle



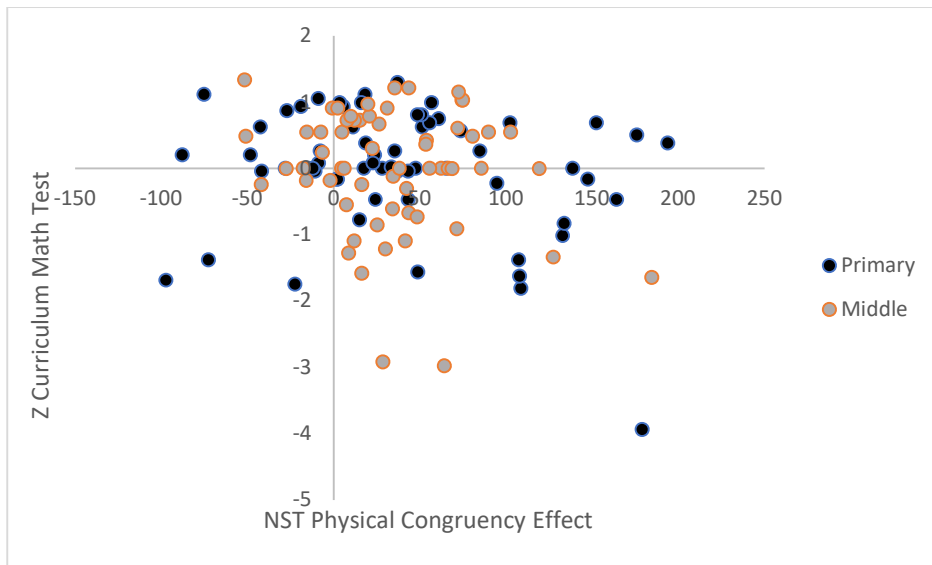
S11. Correlation between PST Location congruency effect and Z- Curriculum Math Test



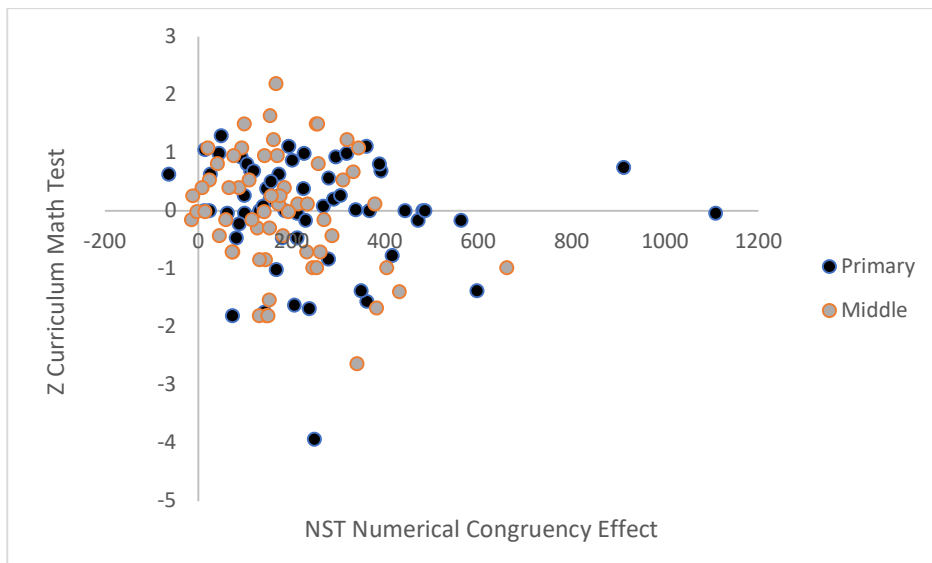
S12. Correlation between PST Direction Congruency Effect and Z Curriculum Math Test



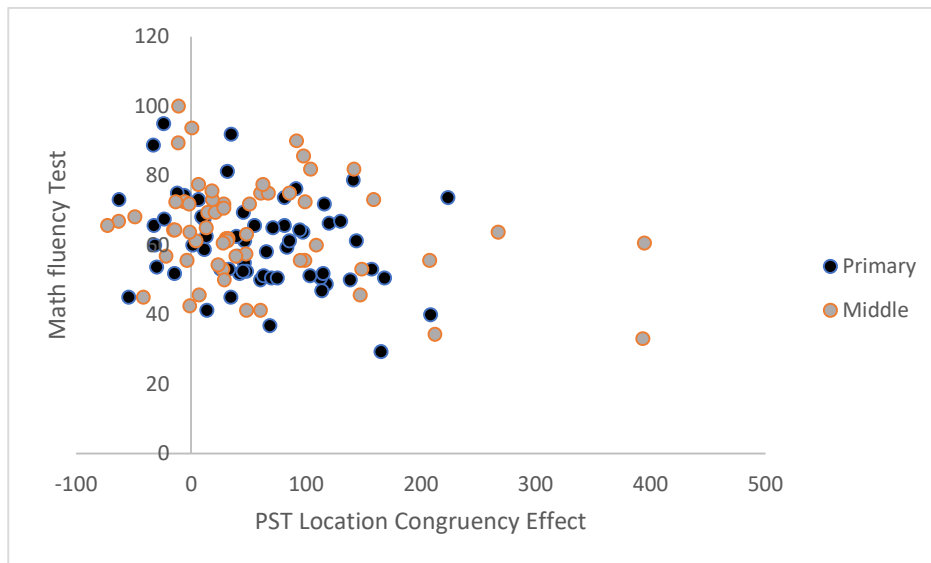
S13. Correlation between NST Physical Congruency Effect and Z Curriculum Math Test



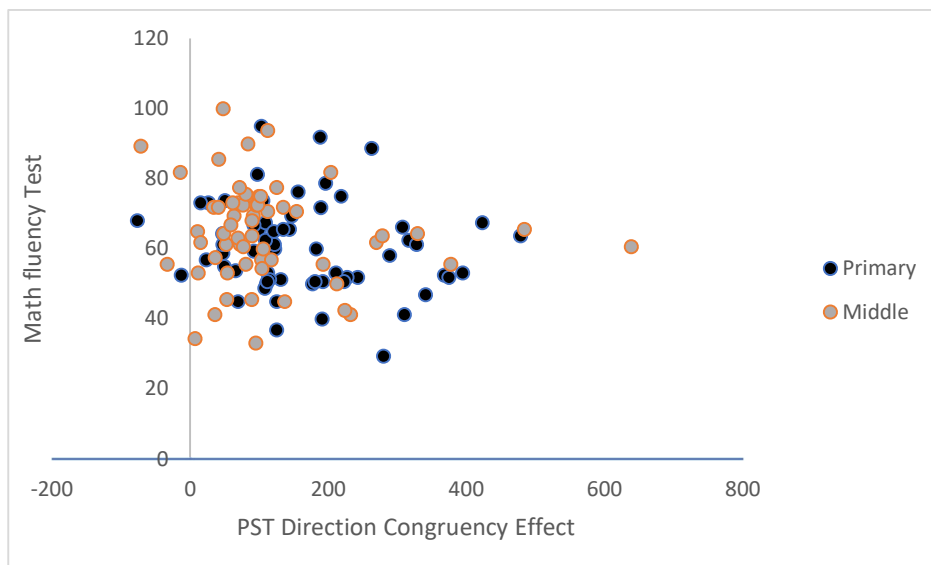
S14. Correlation between NST Numerical Congruency Effect and Z Curriculum Math Test



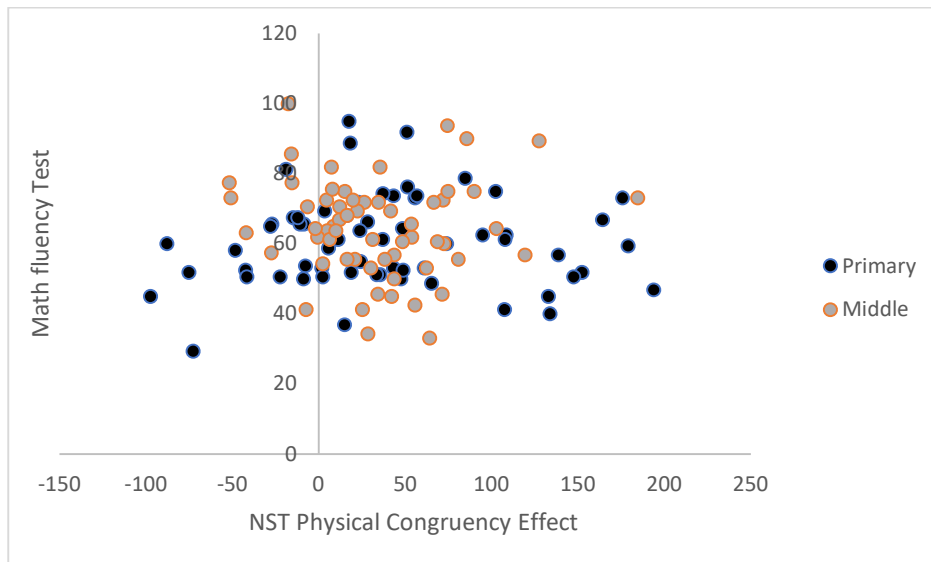
S15. Correlation between PST Location Congruency Effect and Math fluency Test



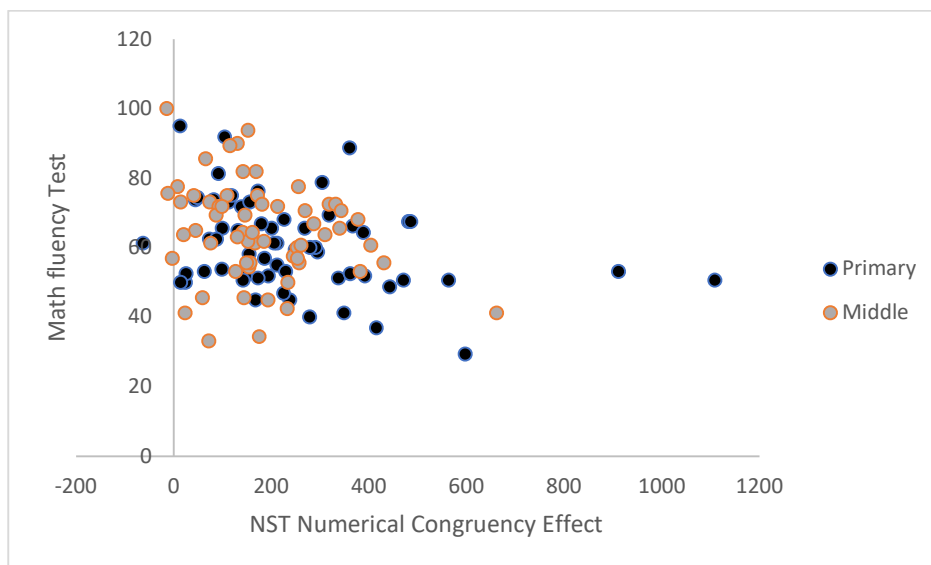
S16. Correlation between PST Direction Congruency Effect and Math fluency Test



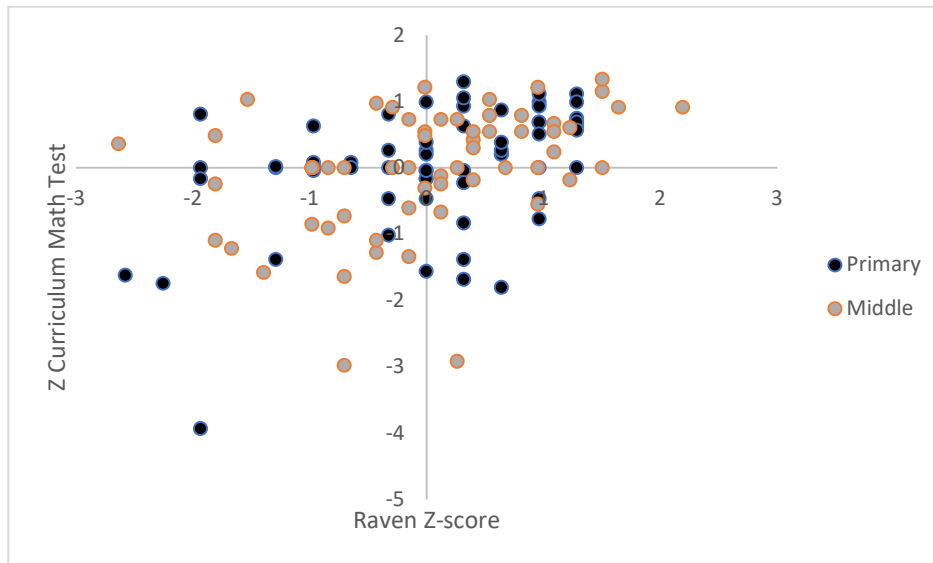
S17. Correlation between NST Physical Congruency Effect and Math fluency Test



S18. Correlation between NST Numerical Congruency Effect and Math fluency Test



S19. Correlation between Z Curriculum Math Test and Raven Z score



S20. Correlation between Math fluency Test and Raven Z score

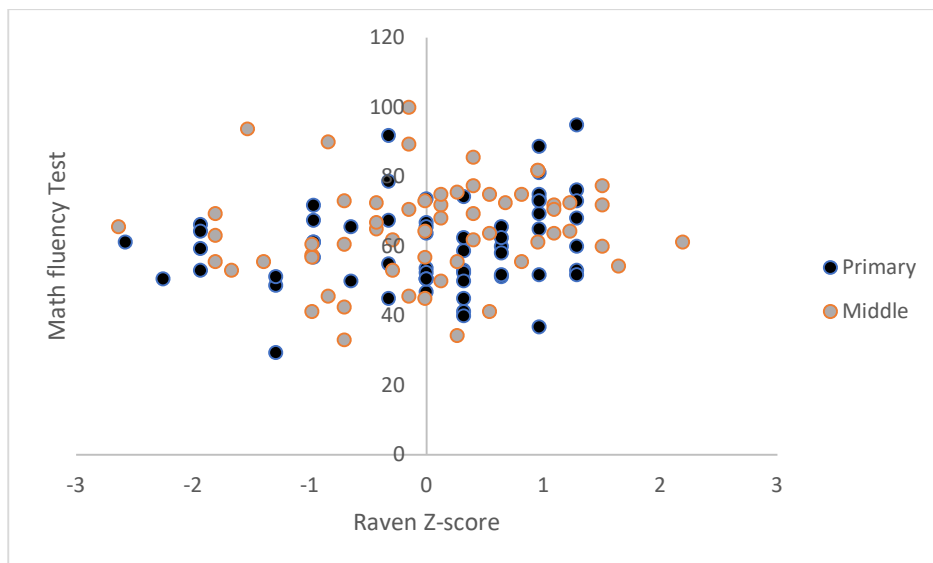


Table S2. Fisher r to z analysis between correlations of cognitive control measures and Raven score with math achievements between Age Groups.

N for primary school students is 62 and for middle school students is 60.

A. Raven and Math fluency

	n	r
Correlation 1	62	.22
Correlation 2	60	.14
Test Statistic <i>z</i>	0.445	
Probability <i>p</i>	0.328	

B. Raven and Math curriculum

	n	r
Correlation 1	62	.49
Correlation 2	60	.40
Test Statistic <i>z</i>	0.605	
Probability <i>p</i>	0.273	

C. Location-congruency effect and Math fluency

	n	r
Correlation 1	62	-.27
Correlation 2	60	-.25
Test Statistic <i>z</i>	-0.116	
Probability <i>p</i>	0.454	

D. Location-congruency effect and Math curriculum

	n	r
Correlation 1	62	-.27
Correlation 2	60	-.31
Test Statistic z	0.235	
Probability p	0.407	

E. Direction-congruency effect and Math fluency

	n	r
Correlation 1	62	-.16
Correlation 2	60	-.14
Test Statistic z	-0.11	
Probability p	0.456	

F. Direction-congruency effect and Math curriculum

	n	r
Correlation 1	62	-.18
Correlation 2	60	.11
Test Statistic z	-1.575	
Probability p	0.058	

G. Physical-congruency effect and Math fluency

	n	r
Correlation 1	62	.03
Correlation 2	60	-.03
Test Statistic z	0.323	
Probability p	0.373	

H. Physical-congruency effect and Math curriculum

	n	r
Correlation 1	62	-.22
Correlation 2	60	-.21
Test Statistic z	-0.056	
Probability p	0.477	

I. Numerical-congruency effect and Math fluency

	n	r
Correlation 1	62	-.33
Correlation 2	60	-.25
Test Statistic z	-0.471	
Probability p	0.319	