

Introduction

- In the field of math word problem (WP) understanding, a subset of research investigates children's ability to consider real world knowledge when answering word problems that require the use of real world knowledge (Verschaffel, Greer, & De Corte, 2000).
- E.g., If Rob was born in 1978 and it is now 1993, children have to realize that Rob's age is dependent upon which month he was born in and that Rob could be 14 or 15 yrs old.
- Children in European and Asian countries (Yoshida, Verschaffel, & DeCorte, 1997) perform poorly
- 1st goal: Replicate these findings in a sample of Grade 6 Canadian students
- 2nd goal: Test whether writing answers in the form of a sentence increases the number of realistic answers, and
- 3rd goal: Determine whether Reading Comprehension, Math Calculation Skills, and Math Reasoning influence performance

Methods

Participants

- 85 grade 6 students (41 boys and 44 girls, $M_{Age} = 11.737$ yrs, $SD = .359$)
 - Ctrl (n = 44, 20 boys and 24 girls, $M_{Age} = 11.732$ yrs, $SD = .379$)
 - Exp (n = 41, 21 boys and 20 girls, $M_{Age} = 11.741$ yrs, $SD = .340$)

Procedure

- Schools randomly assigned to Ctrl and Exp groups
- Word problems booklet (10 WPs; 5-S and 5-R)
 - 4 Versions
- Woodcock-Johnson III Tests of Achievement (WCJ III ACH)
 - 6 subtests, 3 Composite Measures, 2 Orders

Coding

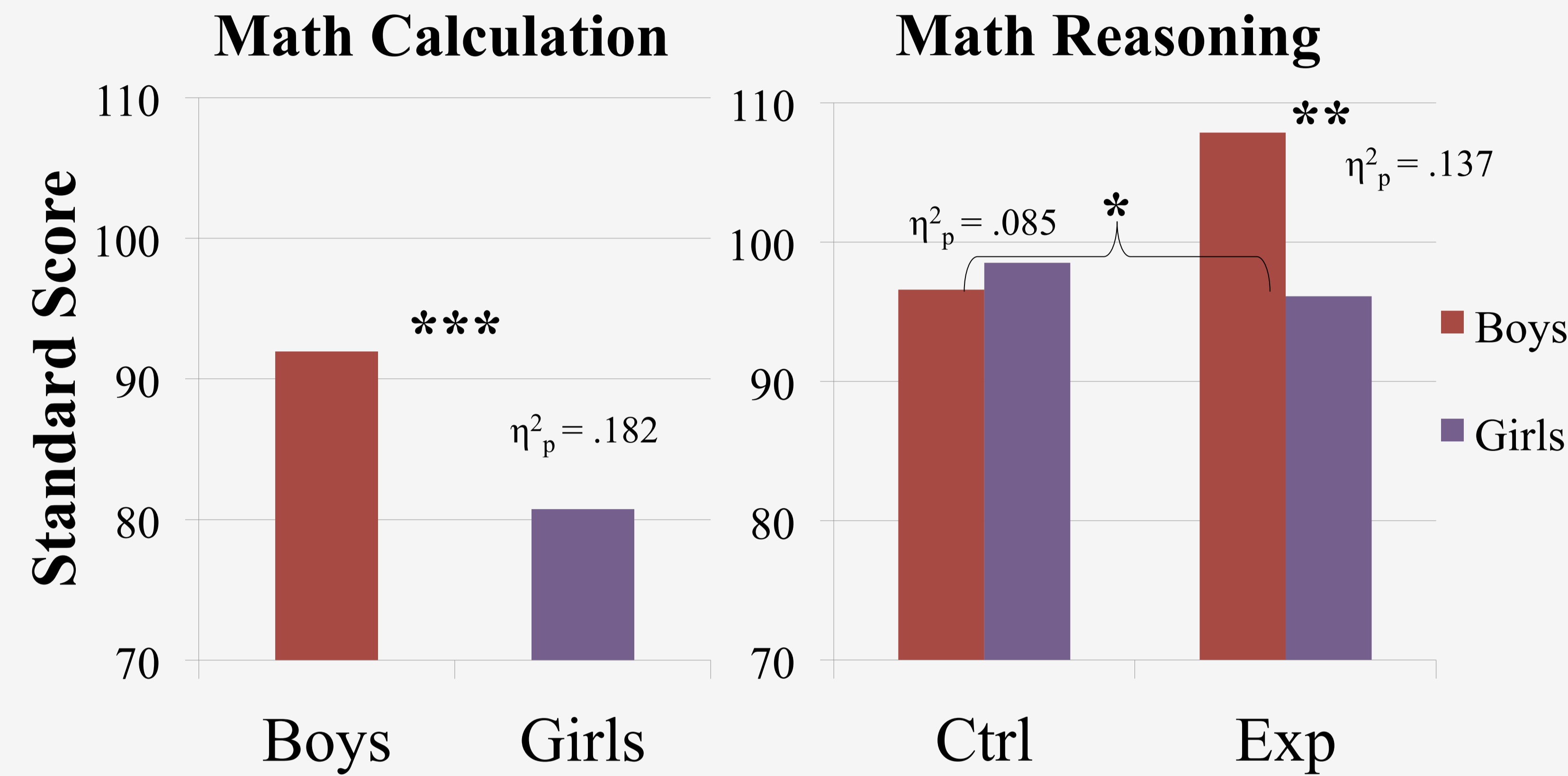
- EA (expected answer)
- RA (realistic answer)
- RATE (realistic answer with technical error)
- NA (no answer), and
- OA (other answer)
- RR (realistic response, i.e., anything that shows realistic consideration)

Common theme in literature

- Elementary school children respond to realistic WPs using realistic knowledge at a rate of 16-17% (Verschaffel, Greer, & De Corte, 2000)
- If 16-17% falls within the 95% CI around the mean percent of RRs in the current data then we can say that our sample is comparable to what is found in the literature.
 - $RA_{Ctrl}: M = 13.18\%$, 95% CI [9.05%, 17.31%]
 - $RR_{Ctrl}: M = 22.44\%$, 95% CI [15.06%, 26.76%]



Results



Note * $p < .05$, ** $p < .01$, *** $p < .001$

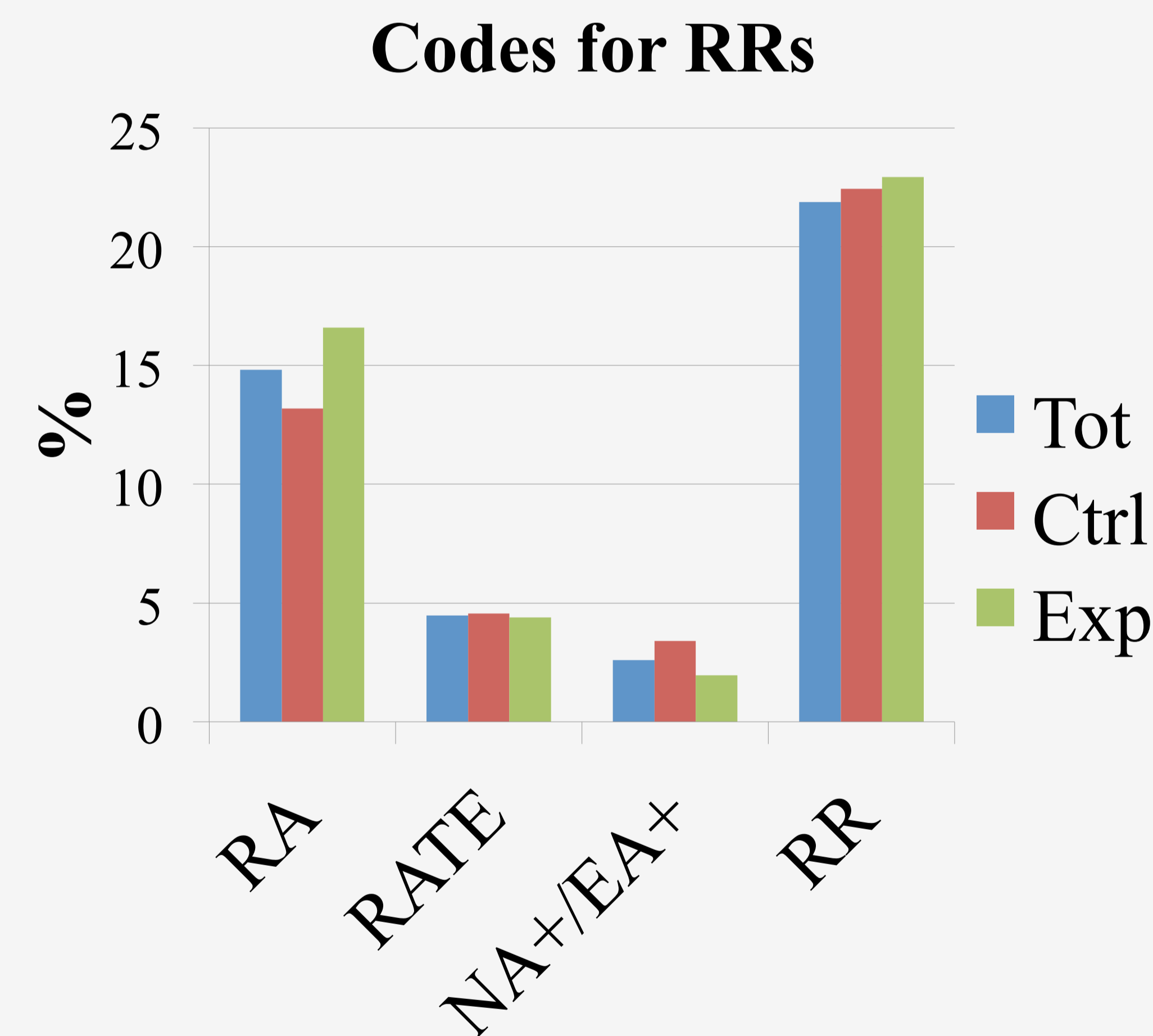
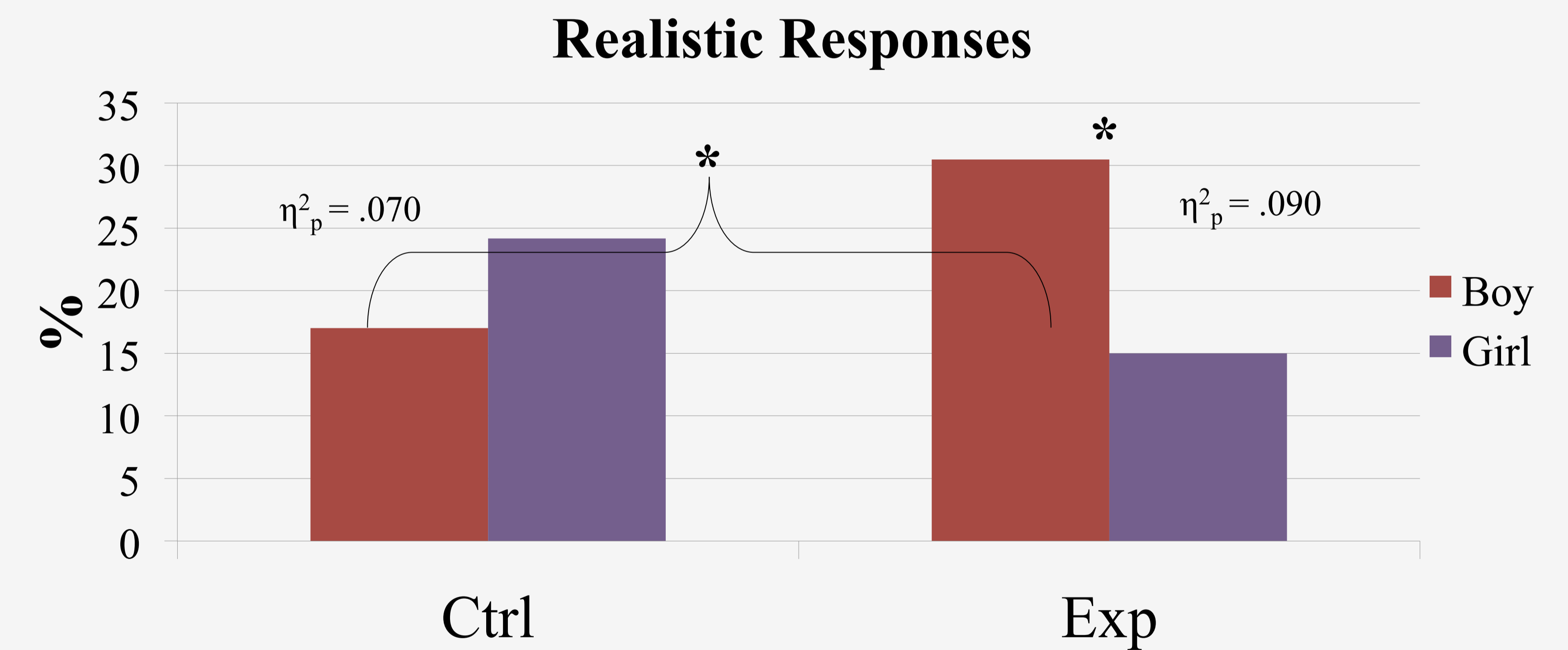


Table 1. Regression Coefficients, R Square, and Semi-Partial Correlations for WCJ III ACH Composite Measures across Condition for RA and RR codes (N = 85).

Code	Condition	R Square	WCJ Composite	B	Semi-Partial
RA	Control	.069	Reading Comprehension	-.003	-.029
			Math Calculation	.007	.089
			Math Reasoning	-.011	-.083
RR	Experimental	.331*	Reading Comprehension	.000	.003
			Math Calculation	.048*	.458
			Math Reasoning	-.023	-.199
RR	Control	.234	Reading Comprehension	.034	.155
			Math Calculation	-.017	.268
			Math Reasoning	-.002	-.008
RR	Experimental	.333*	Reading Comprehension	.001	.013
			Math Calculation	.052*	.397
			Math Reasoning	-.016	-.111

Note. * $p < .01$



Note. * $p < .05$

Conclusions

- Students in St. John's NL are performing no different than the literature would suggest
 - Percentage of realistic responses varies by WP type, ranging from 0% to 72%
 - DWR problems result in the highest percentage of RR (i.e., Balloon question)
- Having students report their answer in a full sentence format was only beneficial for boys, adding this feature did not improve performance for girls, in fact girls' performance declined in comparison to the control condition, however, this decline was not significant
- The three composite measures used from the WCJ III ACH did account for a significant amount of variance in realistic answers and general realistic responding, but only in the experimental condition.
 - Specifically, Math Calculation skills account for a unique amount of variance in realistic answers and in general realistic responding (21.2% and 16%, respectively).