Supplemental Online Appendix for:

Parents' Beliefs About Their Children's Academic Ability: Implications for Educational Investments

Rebecca Dizon-Ross

Table of Contents

C. Online Appendix Tables

Online Appendix Table C.1: Belief Accuracy, Uncertainty, Overconfidence, and Children's Academic Performance

Dependent variable:	**Belief inaccuracy** Abs.val.[believed - true score]		**Uncertainty** Std. dev. of beliefs		**Overconfidence** Believed - true score		**Performance** Score	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parents' years education	-0.202	-0.198	-0.614	-0.612	-0.079	-0.089	0.348	0.333
	[0.064]	[0.066]	[0.055]	[0.056]	[0.088]	[0.090]	[0.076]	[0.077]
Child and parent controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	5,220	5,019	5,171	4,974	5,220	5,019	5,230	5,029
Dep. Var. Mean	20.383		7.658		15.629		46.715	

Notes: Data sources are baseline survey and baseline test score data. Each observation is a child. Standard errors are clustered at the household level. "Parents' years education" is the household-average years of parental education. Scores and beliefs are about overall performance. The child and parent controls include a control for child gender, grade FE, parent gender, and whether the parent is the primary education decisionmaker.

Online Appendix Table C.2: Baseline Knowledge of Performance, by Education

Dependent variable:	Don't know performance	Didn't receive report card		Don't know if report card has has grades, scores, OR positions		Don't know if report card has grades, scores, AND positions	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. School Code Fixed Effects							
High Parent Educ	-0.21	-0.057	0.071	-0.11	-0.12	-0.084	-0.11
	[0.018]	[0.017]	[0.024]	[0.023]	[0.036]	[0.018]	[0.034]
Sample Mean:	0.60	0.30	0.49	0.34	0.67	0.16	0.32
Low Educ Mean:	0.72	0.35	0.48	0.38	0.73	0.20	0.39
Observations	5,230	5,222	3,147	3,147	1,601	3,147	1,601
School Code FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Conditional on not knowing performance	N/A	No	Yes	Yes	Yes	Yes	Yes
Conditional on receiving receiving report card	No	N/A	N/A	No	Yes	No	Yes
Panel B. No School Code Fixed Effects							
High Parent Educ	-0.24	-0.098	0.035	-0.099	-0.15	-0.094	-0.17
	[0.018]	[0.017]	[0.025]	[0.023]	[0.033]	[0.018]	[0.032]
Sample Mean:	0.60	0.30	0.49	0.34	0.67	0.16	0.32
Low Educ Mean:	0.72	0.35	0.48	0.38	0.73	0.20	0.39
Observations	5,230	5,222	3,147	3,147	1,601	3,147	1,601
School Code FE	No	No	No	No	No	No	No
Conditional on not knowing performance	N/A	No	Yes	Yes	Yes	Yes	Yes
Conditional on receiving receiving report card	No	N/A	N/A	No	Yes	No	Yes

Notes: Table shows baseline parental knowledge of children's performance by parental education (column 1) as well as potential reasons for the lack of knowledge (columns 2-7). "High Parent Educ" takes the value of 1 for above-median parent education and 0 otherwise. Column 2 shows the percentage of parents who did not receive report cards, and column 3 shows this conditional on the parent not knowing child's performance. The outcome variables in columns 4 and 5 are proxies for lack of understanding the report card. Panel A shows results with school code fixed effects and Panel B shows results without school code fixed effects. Standard errors are clustered at the household level.

Online Appendix Table C.3: Inaccuracies in beliefs about both absolute and relative academic performance

	Full sample	
	Mean	SD
A. Absolute academic performance		
Abs Val [Believed − True Overall Score]	20.4	14.5
Abs Val [Believed − True Math Score]	25.8	18.0
Abs Val [Believed − True English Score]	21.4	16.4
Abs Val [Believed − True Chichewa Score]	23.8	17.5
Abs Val [Believed − True (Math-English) Score]	22.1	17.4
Abs Val [Believed − True Overall Score (Child1-2)]	18.7	15.1
Believed - True Overall Score	15.6	19.5
Believed Score Higher than True Score	0.79	0.41
B. Relative academic performance		
Abs Val [Believed − True Overall Percentile]	32.2	24.0
Abs Val [Believed − True Math Percentile]	33.3	25.0
Abs Val [Believed − True English Percentile]	30.6	23.4
Abs Val [Believed − True Chichewa Percentile]	33.8	24.7
Abs Val [Believed − True (Math-English) Percentile]	25.7	21.6
Abs Val [Believed − True Overall Percentile (Child1-2)]	32.5	22.7
Believed - True Overall Percentile	27.0	29.7
Believed Percentile Higher than True Percentile	0.8	0.4
Sample Sizes		
Sample Size–HHs	2,634	
Sample Size–Kids	5,268	

Notes: Data source is baseline survey.

Online Appendix Table C.4: Heterogeneity in belief accuracy (attenuation) by parent education: Robustness across measures of education and academic performance

	Coefficient estimate on interaction education and true score from regression predicting beliefs:							
	Respondent's				Parent-average			
	Years of educ.	Above-median educ.	At least secondary educ.	Parent is literate	Years of educ.	Above-median educ.	At least secondary educ.	Parent is literate
Dependent Variables								
Panel A. Scores								
Average score	0.012	0.099	0.109	0.065	0.013	0.075	0.171	0.073
	[0.004]	[0.025]	[0.039]	[0.028]	[0.004]	[0.025]	[0.042]	[0.034]
Math score	0.014	0.084	0.149	0.066	0.018	0.08	0.222	0.11
	[0.004]	[0.026]	[0.038]	[0.028]	[0.004]	[0.026]	[0.042]	[0.035]
English score	0.01	0.086	0.092	0.08	0.011	0.062	0.121	0.093
	[0.004]	[0.029]	[0.041]	[0.033]	[0.004]	[0.03]	[0.048]	[0.04]
Chichewa score	0.007	0.065	0.071	0.018	0.009	0.062	0.113	0.011
	[0.003]	[0.024]	[0.04]	[0.026]	[0.004]	[0.024]	[0.043]	[0.032]
(Math-English) Score	0.011	0.039	0.112	0.05	0.012	0.076	0.091	0.061
	[0.004]	[0.033]	[0.048]	[0.036]	[0.005]	[0.033]	[0.052]	[0.046]
Child 1 - Child 2's Overall Score	0.015	0.13	0.084	0.084	0.018	0.107	0.182	0.108
	[0.005]	[0.032]	[0.054]	[0.035]	[0.005]	[0.032]	[0.058]	[0.044]
Panel B. Percentiles								
Average percentile	0.01	0.07	0.097	0.064	0.013	0.056	0.129	0.087
	[0.002]	[0.017]	[0.028]	[0.018]	[0.003]	[0.017]	[0.031]	[0.022]
Math percentile	0.009	0.058	0.114	0.066	0.013	0.069	0.159	0.106
	[0.003]	[0.018]	[0.03]	[0.019]	[0.003]	[0.018]	[0.033]	[0.024]
English percentile	0.008	0.064	0.058	0.073	0.01	0.041	0.069	0.095
	[0.003]	[0.022]	[0.033]	[0.024]	[0.003]	[0.022]	[0.038]	[0.03]
Chichewa percentile	0.007	0.045	0.06	0.04	0.008	0.044	0.078	0.04
	[0.002]	[0.017]	[0.029]	[0.018]	[0.003]	[0.017]	[0.033]	[0.022]
(Math-English) Percentile	0.006	0.025	0.042	0.025	0.007	0.053	0.055	0.036
	[0.003]	[0.021]	[0.028]	[0.022]	[0.003]	[0.021]	[0.03]	[0.028]
Child 1 - Child 2's Overall Percentile	0.013	0.086	0.117	0.075	0.015	0.062	0.162	0.086
	[0.003]	[0.02]	[0.038]	[0.021]	[0.003]	[0.02]	[0.042]	[0.026]
Sample size	5,230	5,230	5,230	5,242	5,242	5,230	5,230	5,242

Notes: Data sources are baseline survey and baseline test score data. Each cell represents the coefficient from a separate regression of beliefs about the child's score or percentile on the true score or percentile, the parents' education, and the parents' education interacted with the true score or percentile. The coefficient presented is the coefficient on the interaction term. A positive coefficient indicates that true scores are more predictive of the beliefs of more-educated parents. Different regressions vary the measure used for score or performance (rows) and the measure of parental education (columns). Each observation is a child. Standard errors are clustered at the household level. Regressions control for child's gender, grade, parent gender, and a parental education proxy used for stratification.

Online Appendix Table C.5: Robustness of information treatment effects to using relative performance measure (percentiles)

	Experimental outcomes					Non-experimental outcomes		
Dep. Var.	Endline Beliefs	Math Workbook Difficulty Level	English Workbook Difficulty Level	ln(Math Textbook WTP) - ln(English Textbook WTP)	Secondary School Lottery Tickets	Enrollment	ln(Total Educ. Expenditures)	Attendance Rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treat × Percentile	0.18	0.74	0.67	0.0076	0.018	0.055	0.00021	-0.0019
	[0.016]	[0.067]	[0.067]	[0.0015]	[0.0031]	[0.024]	[0.0013]	[0.027]
Percentile	0.18	0.40	0.50	0.00097	0.0042	-0.0034	0.00098	0.044
	[0.011]	[0.046]	[0.050]	[0.0010]	[0.0026]	[0.015]	[0.00088]	[0.019]
Treat	-16.7	-71.3	-48.5	0.14		-3.25	-0.011	-0.32
	[0.98]	[4.27]	[4.17]	[0.041]		[1.60]	[0.083]	[1.80]
Observations	5,244	5,239	5,239	5,219	5,258	1,786	1,709	1,827

Notes: This table replicates the regressions showing the effect of information on the slope of the investment function from Table 2 and Panel A of Table 3 (odd-numbered columns), but now using percentiles instead of scores as the academic performance measure. The dependent variable in Column (1) corresponds to the parent's endline beliefs about the child's overall score on a hypothetical test taken the same day as the endline survey. See notes from Tables 2 and 3 for details. *** p<0.01, ** p<0.05, * p<0.1

Online Appendix Table C.6: Predicting endline school performance with baseline actual and believed school performance (control group only)

	Endline test scores			
Dep. Var.	Overall	Math	English	Chichewa
	(1)	(2)	(3)	(4)
Baseline Score	0.74	0.71	0.51	0.60
	[0.063]	[0.077]	[0.061]	[0.063]
Baseline Believed Score	0.081	-0.011	0.042	0.13
	[0.070]	[0.084]	[0.068]	[0.069]
Observations	198	216	214	222
R-squared	0.410	0.268	0.220	0.325
Baseline score used	Overall	Math	English	Chichewa

Notes: Table shows regression of endline test scores on baseline test scores and parents' baseline beliefs about test scores. Data sources are baseline survey, baseline test score data, and endline test score data. Endline test score data only available for selected schools and classrooms. Control group data used only. Each observation is a child. Standard errors are clustered at the household level.

Online Appendix Table C.7: Information treatment effects: Robustness to excluding controls

	Experimental outcomes					Non-experimental outcomes		
Dep. Var.	Endline beliefs	Math workbook difficulty level	English workbook difficulty level	ln(Math textbook WTP) - ln(English textbook WTP)	Secondary school lottery tickets	Enrollment	ln(Total educ. expenditures)	Attendance rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Base results								
Treat × Score	0.40	1.33	1.25	0.013	0.036	0.11	-0.0018	0.021
	[0.025]	[0.093]	[0.096]	[0.0022]	[0.0052]	[0.038]	[0.0022]	[0.049]
Score	0.32	0.65	0.76	0.0023	0.015	-0.018	0.0038	0.086
	[0.018]	[0.066]	[0.073]	[0.0016]	[0.0051]	[0.023]	[0.0015]	[0.034]
Treat	-25.9	-91.0	-68.4	0.14		-5.33	0.087	-1.36
	[1.33]	[4.91]	[4.83]	[0.041]		[2.10]	[0.11]	[2.62]
Panel B. No controls								
Treat × Score	0.40	1.32	1.25	0.013	0.036	0.11	-0.0013	0.011
	[0.025]	[0.093]	[0.096]	[0.0022]	[0.0052]	[0.038]	[0.0022]	[0.049]
Score	0.32	0.60	0.80	0.0032	0.015	-0.018	0.0039	0.093
	[0.018]	[0.065]	[0.074]	[0.0016]	[0.0051]	[0.024]	[0.0016]	[0.034]
Treat	-26.0	-90.2	-68.0	0.14		-5.52	0.068	-0.77
	[1.33]	[4.94]	[4.83]	[0.041]		[2.10]	[0.12]	[2.67]
Control group mean	63.56	29.47	1.10	-0.30	0.01	97.95	7.39	91.06
Observations	5,244	5,239	5,239	5,219	5,258	1,786	1,709	1,827
Score Used	Overall	Math	English	English − Math	Overall	Overall	Overall	Overall

Notes: Panel A replicates all the main treatment effect on the slope regressions from Table 2 and the odd-numbered columns of Panel A of Table 3. Panel B shows those regressions without controls. The dependent variable in Column (1) corresponds to the parent's endline beliefs about the child's overall score on a hypothetical test taken the same day as the endline survey.

Online Appendix Table C.8: Heterogeneity in the treatment effect on the slope, by parent education: Robustness to excluding controls

Dep. Var.	Endline Beliefs	Math Workbook Difficulty Level	English Workbook Difficulty Level
	(1)	(2)	(3)
Panel A. Base results			
Treat × Score × Parent yrs of educ.	-0.026	-0.12	-0.066
	[0.0071]	[0.027]	[0.029]
Treat × Score	0.53	1.92	1.57
	[0.044]	[0.16]	[0.17]
Score × Parent yrs of educ.	0.022	0.079	0.033
	[0.0051]	[0.020]	[0.022]
Score	0.21	0.28	0.61
	[0.031]	[0.11]	[0.13]
Panel B. No controls			
Treat × Score × Parent yrs of educ.	-0.027	-0.12	-0.069
	[0.0072]	[0.027]	[0.029]
Treat × Score	0.53	1.91	1.58
	[0.045]	[0.16]	[0.17]
Score × Parent yrs of educ.	0.023	0.077	0.036
	[0.0051]	[0.020]	[0.022]
Score	0.21	0.25	0.63
	[0.031]	[0.11]	[0.13]
Observations	5,208	5,203	5,203
Score Used	Overall	Math	English

Notes: Notes: Data sources are baseline survey, baseline test score data, both endline surveys, and endline administrative data. Standard errors clustered at household level. Table shows the heterogeneity by parent education in the information treatment effect on the gradient of the investment function. Each observation is a child. The dependent variable in Column (1) corresponds to the parent's endline beliefs about the child's overall score on a hypothetical test taken the same day as the endline survey. Parents' years of education (Parent yrs of educ.) is the household-average years of parental education. All regressions control for treat, Parent yrs of educ, treat X Parent yrs of educ, and a parental education proxy used for stratification. Panel A additionally controls for school FE, the between-child score gap, child gender, grade FE, and parent gender. Panel B re-estimates those regressions without the additional control variables.

Online Appendix Table C.9: Treatment effects on the slope: Robustness of workbook results to ordered probit specification

	Math Workbook			English Workbook		
Marginal effect on probability that workbook difficulty choice was:	Beginner (1)	Average (2)	Advanced (3)	Beginner (4)	Average (5)	Advanced (6)
Treat × Score	-0.006	-0.002	0.008	-0.007	0.001	0.007
	0.000	0.000	0.001	0.001	0.000	0.001
Treat	0.390	0.126	-0.516	0.386	-0.028	-0.358
	0.021	0.011	0.029	0.027	0.007	0.026
Score	-0.003	-0.001	0.004	-0.004	0.000	0.003
	0.000	0.000	0.000	0.000	0.000	0.000
Control group mean	29.47			1.10		
Observations	5239			5239		
Score Used	Math			English		

Notes: Table replicates columns (1) and (2) of Table 2 (testing for a treatment effect on the slope, using the workbook difficulty choice as a outcome), but using an ordered probit model instead of a linear model. Coefficients shown are the marginal effects on the probability that the respondent's choice was beginner (columns (1) and (4)), average ((2) and (5)), or advanced ((3) and (6)). The results show that the higher the respondent's score, the more that information increases the probability that they choose an advanced workbook, and decreases the probability that they choose a beginner workbook.

Online Appendix Table C.10: Heterogeneity in the treatment effect on the slope, by parent education: Robustness of workbook results to ordered probit specification

	Math Workbook			English Workbook		
Marginal effect on probability that workbook was:	Beginner (1)	Average (2)	Advanced (3)	Beginner (4)	Average (5)	Advanced (6)
Treat × Score × Parent yrs of educ.	0.00057	0.00018	-0.00075	0.00041	-0.00003	-0.00038
	0.00013	0.00004	0.00017	0.00017	0.00001	0.00015
Treat × Score	-0.00858	-0.00277	0.01134	-0.00910	0.00065	0.00845
	0.00077	0.00031	0.00102	0.00099	0.00017	0.00092
Score × Parent yrs of educ.	-0.00034	-0.00011	0.00045	-0.00017	0.00001	0.00016
	0.00009	0.00003	0.00011	0.00011	0.00001	0.00010
Score	-0.00116	-0.00037	0.00153	-0.00290	0.00021	0.00269
	0.00048	0.00016	0.00064	0.00066	0.00007	0.00061
Control group mean	29.48			0.99		
Observations	5203			5203		
Score Used	Math			English		

Notes: Table replicates columns (2) and (3) of Table C.8 (testing for heterogeneity in the treatment effect on the slope by parent's education, using the workbook difficulty choice as a outcome), but using an ordered probit model instead of a linear model. Coefficients shown are marginal effects estimates using the ordered probit on the probability that the respondent's choice was beginner (columns (1) and (4)), average ((2) and (5)), or advanced ((3) and (6)). The higher the respondent's score, the higher the treatment effect on the lower-difficulty workbooks and the larger on the higher-difficulty workbooks.

Online Appendix Table C.11: Information treatment effects on the slope of textbook WTP, seperated by subject

Dependent variable:	ln(math textbook WTP)	ln(English textbook WTP)	ln(math textbook WTP) - ln(English textbook WTP)
	(1)	(2)	(3)
Treat × Score	0.00100	0.0050	0.013
	[0.0023]	[0.0023]	[0.0022]
Score	0.00077	0.00078	0.0023
	[0.0017]	[0.0015]	[0.0016]
Treat	0.12	0.15	0.14
	[0.12]	[0.12]	[0.041]
Observations	5,237	5,233	5,219
R-squared	0.065	0.052	0.036
Score Used	Math	English	English – Math
Household FE	No	No	No

Notes: Data sources are baseline survey, baseline test score data, and the endline survey. Each observation is a child. Standard errors are clustered at the household level.
The regressions test for whether information changes the slope of investments on children's academic performance (where academic performance is measured as children's average scores on school-administered achievement exams). One way to interpret the results is to compare the baseline slope in the control group (coefficient on Score) with the increase in the slope in the treatment group (coefficient on Treat × Score) to see how much the slope has increased as a result of information. Regressions control for school FE, average parental years of education, the between-child score gap, child gender, grade FE, parental education proxy used for stratification, and parent gender.

Online Appendix Table C.12: Robustness of Textbook Results to Different Specifications

Dependent variable:	Textbook WTP for Math - English				
	(1)	(2)	(3)	(4)	(5)
Treat × Score	2.05	0.0081	0.013	0.011	0.055
	[0.34]	[0.0012]	[0.0022]	[0.0017]	[0.0068]
Score	0.48	0.0018	0.0023	0.0021	0.014
	[0.25]	[0.00088]	[0.0016]	[0.0013]	[0.0048]
Treat	11.4	0.046	0.14	0.11	0.45
	[6.53]	[0.023]	[0.041]	[0.032]	[0.13]
Observations	5,219	4,742	5,219	5,219	5,219
R-squared	0.029	0.048	0.036	0.042	0.060
WTP measure	WTP in levels	ln(WTP)	ln(WTP+ min(WTP)*.1)	ln(WTP + min(WTP)*.5)	IHS(WTP)
Score Used	English – Math	English – Math	English – Math	English – Math	English – Math
Household FE	No	No	No	No	No

Notes: Table replicates the specification from column 4 of Table 2 using different WTP measures.

Online Appendix Table C.13: Robustness of information treatment effects: Experimental outcomes

	Treatment effect on slope *(Columns vary the control variables)*				
	(1)	(2)	(3)	(4)	(5)
Panel A. Dependent var: Endline Beliefs					
Treat × Score	0.41	0.36	0.36	0.37	0.37
	[0.025]	[0.046]	[0.046]	[0.046]	[0.046]
Treat	-26.2				
	[1.33]				
Observations	5,244	5,244	5,244	5,244	5,244
R-squared	0.339	0.760	0.760	0.763	0.764
Panel B. Dependent var: ln(Math Textbook WTP) - ln(English Textbook WTP)					
Treat × (English − Math Score)	0.013	0.013	0.013	0.013	0.014
	[0.0022]	[0.0037]	[0.0037]	[0.0039]	[0.0039]
Treat	0.14				
	[0.041]				
Observations	5,219	5,219	5,219	5,219	5,219
R-squared	0.036	0.602	0.602	0.602	0.603
Panel C. Dependent var: Math Workbook Choice					
Treat × Math Score	1.33	1.20	1.20	1.13	1.13
	[0.093]	[0.17]	[0.17]	[0.17]	[0.17]
Treat	-91.0				
	[4.91]				
Observations	5,239	5,239	5,239	5,239	5,239
R-squared	0.218	0.695	0.695	0.696	0.696
Panel D. Dependent var: English Workbook Choice					
Treat × English Score	1.25	1.27	1.26	1.33	1.33
	[0.096]	[0.17]	[0.17]	[0.17]	[0.17]
Treat	-68.4				
	[4.83]				
Observations	5,239	5,239	5,239	5,239	5,239
R-squared	0.206	0.710	0.710	0.714	0.715
Panel E. Dependent var: Lottery tickets received					
Treat × Score		0.036	0.036	0.037	0.036
		[0.0052]	[0.0052]	[0.0052]	[0.0054]
Observations		5,258	5,258	5,258	5,080
R-squared		0.154	0.155	0.157	0.170
Includes controls for (all panels):					
Household FE	No	Yes	Yes	Yes	Yes
Treat × Female	No	No	Yes	Yes	Yes
Treat × Grade Level	No	No	No	Yes	Yes
Treat × Educ. Expenditures	No	No	No	No	Yes

Notes: Data sources are baseline survey, baseline test score data, and the endline survey data. Each observation is a child. Standard errors are clustered at the household level. Regressions control for school FE, grade FE, average parental years of education, parent gender, parental education proxy used for stratification, the between-child score gap, child baseline performance, child gender, and the main effect of any variable interacted with *Treat*. Workbook difficulty choices are coded as 0 for beginner, 100 for average, 200 for advanced. In Panel A, endline beliefs corresponds to parents' beliefs about the child's overall test score. The regressions test for a change in the slope, with the prediction being that information will increase the slope (positive coefficient on *Treat* × *Score*).

Online Appendix Table C.14: Treatment effects on the slope: Robustness of enrollment results to probit specification

Marginal effect on:	Enrollment (1)
Panel A. Base results	
Treat × Score	0.0020
	[0.00060]
Treat	-0.091
	[0.028]
Score	-0.00041
	[0.00037]
Control group mean	96.85
Observations	1,149
Panel B. By parent education	
Treat × Score × Parent yrs of educ.	-0.00016
	[0.00015]
Treat × Score	0.0023
	[0.00077]
Score × Parent yrs of educ.	0.0000057
	[0.00011]
Score	-0.00038
	[0.00048]
Observations	1,143
Score Used	Overall

Notes: Panel A replicates column (1) of Panel A, Table 3 (testing for a treatment effect on the slope, using enrollment as the outcome), but using a probit model instead of a linear probability model. Panel B replicates column (2) of Panel A, Table 3 (testing for heterogeneity in the treatment effect on the slope by parent's education, using enrollment as the outcome), but using a probit model instead of a linear probability model. In both panels, the coefficients shown are marginal effects.

Online Appendix Table C.15: Robustness of information treatment effects: Non-experimental outcomes

	Treatment effect on slope *(Columns vary the control variables)*				
	(1)	(2)	(3)	(4)	(5)
Panel A. Dependent Var: Enrollment					
Treat × Score	0.11	0.10	0.10	0.10	0.10
	[0.038]	[0.071]	[0.071]	[0.071]	[0.070]
Treat	-5.33				
	[2.10]				
Observations	1,786	1,786	1,786	1,786	1,786
p-val: Treat × Score = 0	0.00	0.14	0.14	0.15	0.15
Panel B. Dependent Var: ln(Expenditures)					
Treat × Score	-0.0018	-0.0024	-0.0024	-0.0023	-0.0022
	[0.0022]	[0.0024]	[0.0024]	[0.0024]	[0.0024]
Treat	0.087				
	[0.11]				
Observations	1,709	1,709	1,709	1,709	1,709
p-val: Treat × Score = 0	0.40	0.33	0.33	0.33	0.36
Panel C. Dependent Var: Attendance					
Treat × Score	0.021	0.057	0.056	0.054	0.055
	[0.048]	[0.14]	[0.14]	[0.14]	[0.14]
Treat	-1.36				
	[2.60]				
Observations	1,827	1,827	1,827	1,827	1,827
p-val: Treat × Score = 0	0.67	0.69	0.70	0.71	0.70
Includes controls for (all panels):					
Household FE		✓	✓	✓	✓
Treat × Female			✓	✓	✓
Treat × Grade Level				✓	✓
Treat × Educ. Expenditures					✓

Notes: Data sources are baseline survey, baseline test score data, endline survey, and endline administrative data. Table shows robustness to including the interactions of other variables with treatment. Enrollment is defined as being enrolled in school 1 year after the intervention; enrollment and attendance scaled to be out of 100 (so, for example, enrollment is equal to 100 if the child is still enrolled and 0 otherwise). Attendance is measured in the one month after the intervention. Each observation is a child. Standard errors clustered at the household level. Regressions control for school FE, grade FE, average parental years of education, parent gender, a parental education proxy used for stratification, the between-child score gap, child baseline performance, child gender, the baseline value of the dependent variable (baseline value not available for enrollment since all students enrolled at baseline), and the main effect of any variable interacted with *Treat*. In all panels, the score measure used is overall score.

Online Appendix Table C.16: Heterogeneity in belief accuracy by parent education: Robustness to additional controls

	Dep. Var.: Parent beliefs about child's overall score						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Score × Parents' yrs educ.	0.014	0.013	0.012	0.012	0.012	0.013	0.013
	[0.0038]	[0.0039]	[0.0042]	[0.0042]	[0.0042]	[0.0043]	[0.0043]
Observations	5,220	5,019	5,019	5,019	5,019	5,019	5,019
R-squared	0.121	0.159	0.190	0.190	0.191	0.191	0.192
Includes controls for:							
Score × Respondent Gender and Role	No	Yes	Yes	Yes	Yes	Yes	Yes
Score × School Code	No	No	Yes	Yes	Yes	Yes	Yes
Score × Female	No	No	No	Yes	Yes	Yes	Yes
Score × Grade Level	No	No	No	No	Yes	Yes	Yes
Score × Educ. Expenditures	No	No	No	No	No	Yes	Yes
$Score^2$ and $Score^3$	No	No	No	No	No	No	Yes

Notes: Data sources are baseline survey and baseline test score data. Each observation is a child. Standard errors are clustered at the household level. The table displays regressions of parents' beliefs on their child's true score, the average years of education among the child's parents, the interaction, and a set of controls that includes the between-child score gap as well as the main effect of any variable interacted with score. The prediction is that true scores will be more highly correlated with the beliefs of more-educated parents, which means that the coefficient on "Score × Parents' yrs educ." will be positive.

Online Appendix Table C.17: Baseline beliefs and workbook choice: Heterogeneity in control group by parent education

	Math workbook difficulty level (1)	English workbook difficulty level (2)
Believed score x Parent yrs. of educ.	0.013	0.009
	[0.018]	[0.018]
Believed score	2.207	2.349
	[0.113]	[0.097]
Parents' years education	-0.623	-0.493
	[1.241]	[1.108]
Observations	2,611	2,611
R-squared	0.368	0.433

Notes: Data sources are baseline survey and baseline test score data. Each observation is a child. Standard errors are clustered at the household level. The table displays regressions of control parents' workbook choice on their child's believed score, the average years of education among the child's parents, and the interaction. The dependent variable is equal to 0 if the parent chose the beginner workbook, 100 if they chose the average, and 200 if they chose the advanced.

Online Appendix Table C.18: Asymmetric responses to positive vs. negative information shocks

Dependent variable:	Endline beliefs	Math workbook difficulty level	English workbook difficulty level	Enrollment
	(1)	(2)	(3)	(4)
Treat × Score × Pos. Shock	0.423	1.237	1.610	0.078
	[0.041]	[0.179]	[0.149]	[0.120]
Treat × Score	0.206	0.630	0.252	0.127
	[0.030]	[0.108]	[0.111]	[0.044]
Score Used	Overall	Math	English	Overall
Observations	5,244	5,239	5,239	1,786
R-squared	0.409	0.266	0.281	0.061

Notes: Data sources are baseline survey, baseline test score data, and the endline surveys. The table shows the results of estimating equation 1 (i.e., the equation estimated in Table 2, which shows how information affected the slope of the investment function), fully interacted with an indicator for whether a household was a "positive shock" household, where "positive shock" means that the child's true performance was higher than the parent's baseline beliefs. In the interest of brevity, not all coefficients are shown. The dependent variable in Column (1) corresponds to the parent's endline beliefs about the child's overall score on a hypothetical test taken the same day as the endline survey. Regressions control for school FE, grade FE, average parental years of education, parent gender, a parental education proxy used for stratification, the between-child score gap, child baseline performance, child gender, and all of the main effects and interaction terms (i.e., *Treat*, *Score*, *Pos. Shock*, and all of their double interactions). Each observation is a child. Standard errors are clustered at the household level.

Online Appendix Table C.19: Treatment effects on non-experimental outcomes:
Results for secondary outcomes (transfers, non-monetary investments); detailed expenditure breakdowns

	Non-monetary investments[a]	Enrollment and Transfer		Expenditures - Detailed breakdown						
	Standardized index	Enrollment	Transfer	ln(Total educ. expenditures)	Expenditures on school fees	Supplementary educ. expenditures	Books and school supplies	Uniforms	Backpacks	Tutoring
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A. Heterogeneity in treatment effects by performance										
Treat × Score	-0.00025	0.11	0.00017	-0.0018	-2.93	3.76	-0.88	2.71	0.74	-0.70
	[0.0010]	[0.038]	[0.00071]	[0.0022]	[1.59]	[6.39]	[1.75]	[2.50]	[1.11]	[4.28]
Treat	0.064	-5.33	0.023	0.087	126.5	-69.1	101.6	-91.7	5.39	-2.83
	[0.052]	[2.10]	[0.037]	[0.11]	[62.4]	[272.1]	[90.8]	[136.8]	[51.4]	[158.3]
Score	-0.000092	-0.018	-0.0000022	0.0038	2.47	0.87	3.55	-2.26	0.15	1.75
	[0.00072]	[0.023]	[0.00053]	[0.0015]	[1.43]	[4.36]	[1.51]	[1.81]	[0.69]	[2.61]
Panel B. Average treatment effect										
Treat	0.052	-0.36	0.030	0.00057	-10.7	107.3	60.3	35.4	40.1	-35.6
	[0.022]	[0.71]	[0.014]	[0.048]	[31.6]	[156.6]	[57.1]	[68.9]	[26.8]	[88.8]
Control group mean	-0.013	97.949	0.057	7.389	452.526	1,902.915	617.639	806.402	178.607	300.267
Observations	1,720	1,786	1,781	1,709	1,729	1,729	1,729	1,729	1,729	1,729

Notes: Data sources are baseline survey, baseline test score data, endline survey, and endline administrative data. Each observation is a child. Standard errors are clustered at the household level. Regressions control for school FE, grade FE, average parental years of education, parent gender, a parental education proxy used for stratification, the between-child score gap, child baseline performance, child gender, and the baseline value of the dependent variable (baseline value not available for enrollment or experimental outcomes). Enrollment is defined as being enrolled in school 1 year after the intervention, scaled such that the indicator is 0 or 100. The score measure used is the child's overall score.

Average across all non-monetary investments measured, where all variables are standardized and normalized so that an increase in investments/monitoring was positive. Non-monetary investments measured were: Helped child with homework; Asked someone to help child with homework; # times gave child light source to study at night over last 4 weeks; # times child went to school without food or water in last 4 weeks; Has to push child to attend school regularly; # times monitored child's exercise books in last 4 weeks; # times instructed child to work on homework in last 4 weeks; Hours of chores given to child over last 4 weeks; # times child fetched water in last 4 weeks.

Online Appendix Table C.20: Uncertainty tests: Effect of information on the slope of the *preferred* investment function

	Experimental outcomes				Non-experimental outcomes		
	Math workbook difficulty level	English workbook difficulty level	ln(English textbook WTP) - ln(math textbook WTP)	Lottery tickets	Enrollment	ln(Total educ. expendi-tures)	Attendance rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. Treatment effect on the slope for those with beliefs within 10 pts of truth							
Treat × Score	0.34	0.40	0.00083	0.018	0.15	-0.00046	-0.11
	[0.22]	[0.16]	[0.0048]	[0.010]	[0.069]	[0.0049]	[0.100]
Score Measure	Math	English	Math − English	Score	Score	Score	Score
Treat × Score (full sample)	1.334	1.251	0.014	0.036	0.106	-0.002	0.021
p-val: Treat × Score equal in full sample	0.000	0.000	0.001	0.053	0.950	0.728	0.375
Observations	1,106	1,450	1,416	1,786	534	508	489
Panel B. Heterogeneous treatment effects by score vs. beliefs (equal and opposite indicates no change in slope)							
Treat × Score	1.64	1.67	0.015	0.048	0.10	-0.00051	0.089
	[0.090]	[0.088]	[0.0021]	[0.0056]	[0.046]	[0.0025]	[0.053]
Treat × Beliefs	-1.52	-1.55	-0.011	-0.035	0.016	-0.0034	-0.18
	[0.10]	[0.087]	[0.0021]	[0.0063]	[0.061]	[0.0028]	[0.057]
p-val: (Treat × Score) +(Treat × Beliefs)= 0	0.288	0.209	0.148	0.029	0.020	0.133	0.125
p-val: Treat × Score = 0	0.000	0.000	0.000	0.000	0.029	0.841	0.090
Observations	5,233	5,233	5,213	5,250	1,780	1,703	1,822

Notes: Data sources are baseline survey, baseline test score data, the endline surveys, and endline administrative data. Panel A takes parents whose baseline beliefs were within 10 points of their children's true academic performance as the sample, and examines the treatment effect on the slope of investments on children's true score. Panel B uses the entire experimental sample and looks at the heterogeneity in the treatment effect on the gradients of investments on both the true score and parents' beliefs, where the prediction for no change in the slope of the *preferred function* (i.e., for no uncertainty effects) is that the coefficients are equal and opposite. Regressions control for school FE, parents' education, the between-child score gap, a parental education proxy used for stratification, child baseline performance, grade fixed effects, the baseline value of the dependent variable (baseline value not available for enrollment or experimental outcomes), treatment, and the main effects of any variable interacted with treatment. Thus, both panels control for the main effect of true score, and panel B also controls for the main effect of beliefs. Standard errors clustered at the household level. Workbook difficulty choices are coded as 0 for beginner, 100 for average, and 200 for advanced. Enrollment defined as being enrolled in school 1 year after the intervention; enrollment and attendance scaled to be out of 100 (so, for example, enrollment is equal to 100 if the child is still enrolled and 0 otherwise).

Online Appendix Table C.21: Transfer results: Heterogeneity by school type

	Dependent Variable = Transferred		
	(1)	(2)	(3)
Treat	0.030	0.023	-0.017
	[0.014]	[0.037]	[0.040]
Treat × High-achievement school			0.20
			[0.097]
Treat × Score		0.00017	0.0011
		[0.00071]	[0.00083]
Treat × Score × High-achievement school			-0.0041
			[0.0017]
Observations	1,781	1,781	1,781
R-squared	0.044	0.044	0.048
Dep Var Mean in Control	0.06		
p-val: (Treat × Score)=0		0.814	0.172
p-val: (Treat × Score) + (Treat × Score × High ach.)=0			0.051

Notes: Data sources are baseline survey, baseline test score data, and endline survey. High-achievement schools are defined as being the top quartile of average student achievement scores. Standard errors are clustered at the household level. Regressions control for school FE, grade FE, average parental years of education, parent gender, a parental education proxy used for stratification, the between-child score gap, child baseline performance, child gender, and whether the child is in a high-achievement school. The score measure used is the child's overall score.

Online Appendix Table C.22: Heterogeneity in the treatment effect by the "beliefs shock"

	Experimental outcomes					Non-experimental outcomes		
	Endline Beliefs	ln(WTP for English - Math text-book)	Math work-book	English work-book	Secondary school lottery tickets	Enrollment	ln(Total educ. expendi-tures)	Attendance rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treat × (True - believed score)	0.53	0.013	0.016	0.016	0.043	0.051	0.0012	0.13
	[0.024]	[0.0016]	[0.00081]	[0.00076]	[0.0077]	[0.047]	[0.0023]	[0.046]
Treat	1.52	-0.028	0.0025	0.062		0.43	0.019	1.64
	[0.50]	[0.043]	[0.024]	[0.021]		[0.85]	[0.060]	[1.02]
True - believed score	-0.83	-0.013	-0.017	-0.019	-0.068	-0.024	0.00085	-0.082
	[0.019]	[0.0011]	[0.00060]	[0.00053]	[0.0059]	[0.036]	[0.0018]	[0.039]
Observations	5,240	5,213	5,233	5,233	5,250	1,780	1,703	1,822

Notes: Data sources are baseline survey, baseline test score data, endline survey, and endline administrative data. Each observation is a child. Standard errors are clustered at the household level. Regressions control for school FE, grade FE, average parental years of education, parent gender, a parental education proxy used for stratification, the between-child score gap, child gender, the child's baseline performance, and the baseline value of the dependent variable (baseline value not available for enrollment or experimental outcomes). Column (4) also includes household fixed effects. Workbook difficulty choices are coded as 0 for beginner, 100 for average, and 200 for advanced. Enrollment defined as being enrolled in school 1 year after the intervention; enrollment and attendance scaled to be out of 100 (so, for example, enrollment is equal to 100 if the child is still enrolled and 0 otherwise). "Believed score" corresponds to parents' beliefs about the child's overall test score.

Online Appendix Table C.23: Uncertainty tests: Heterogeneity by baseline uncertainty in the effect of information on the slope of the *preferred* investment function

	Experimental outcomes				Non-experimental outcomes		
	Math workbook difficulty level	English workbook difficulty level	ln(English textbook WTP) - ln(math textbook WTP)	Lottery tickets	Enrollment	ln(Total educ. expenditures)	Attendance rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. Accurate Beliefs Sample: heterogeneity in change in slope by baseline uncertainty							
Treat × Score × Std. dev. of beliefs	0.020	0.032	0.000050	-0.000065	0.0063	0.000058	-0.0022
	[0.023]	[0.019]	[0.00079]	[0.0011]	[0.0094]	[0.00048]	[0.0096]
Treat × Score	0.21	0.17	0.0017	0.019	0.097	-0.00053	-0.094
	[0.29]	[0.20]	[0.0049]	[0.013]	[0.11]	[0.0064]	[0.13]
Observations	1,095	1,438	1,394	1,786	524	498	482
Panel B. Full sample: heterogeneity in change in slope by baseline uncertainty, conditional on beliefs shock							
Treat × Score × Std. dev. of beliefs	0.0085	0.000039	0.00019	-0.00014	0.0068	0.00015	-0.0045
	[0.0090]	[0.0085]	[0.00031]	[0.00051]	[0.0045]	[0.00020]	[0.0044]
Treat × Score	0.063	0.12	0.0038	0.014	0.067	-0.0047	-0.059
	[0.13]	[0.11]	[0.0028]	[0.0074]	[0.064]	[0.0032]	[0.081]
Treat × (Beliefs - Score)	-1.53	-1.55	-0.011	-0.034	0.027	-0.0028	-0.19
	[0.10]	[0.087]	[0.0021]	[0.0063]	[0.060]	[0.0028]	[0.058]
Observations	5,183	5,191	5,126	5,248	1,761	1,684	1,802

Notes: Data sources are baseline survey, baseline test score data, the endline surveys, and endline administrative data. Panel A takes parents whose baseline beliefs were within 10 points of their children's true academic performance as the sample, and examines whether the increase in the slope of investments on children's true score is larger for those with more uncertain beliefs (as proxied by the standard deviation of baseline beliefs). Panel B uses the entire experimental sample and tests whether, conditional on $Treat \times (Score - Beliefs)$, the coefficient on $Treat \times Score$ is heterogeneous with beliefs certainty (as proxied by the standard deviation of baseline beliefs). All regressions control for school FE, parents' education, the between-child score gap, a parental education proxy used for stratification, child baseline performance, grade fixed effects, the baseline value of the dependent variable (baseline value not available for enrollment or experimental outcomes), treatment, and the main effects of any variable interacted with treatment. That means both panels control for the main effect of true score and for *Treat × Std. Dev. of Beliefs*, and panel B also controls for the main effect of $(Score - Beliefs)$. Standard errors clustered at the household level. Workbook difficulty choices are coded as 0 for beginner, 100 for average, and 200 for advanced. Enrollment defined as being enrolled in school 1 year after the intervention; enrollment and attendance scaled to be out of 100 (so, for example, enrollment is equal to 100 if the child is still enrolled and 0 otherwise).

Online Appendix Table C.24: Simultaneous analysis of absolute and relative performance information

	Experimental outcomes				Non-experimental outcomes		
	Math workbook	English workbook	ln(Math textbook WTP) - ln(English textbook WTP)	Secondary school lottery tickets	Enrollment	ln(Total educ. expenditures)	Attendance rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treat × Score	1.36	1.35	0.012	0.028	0.091	-0.0064	0.075
	[0.15]	[0.16]	[0.0028]	[0.013]	[0.077]	[0.0036]	[0.083]
Treat × Relative score	-0.020	-0.087	0.0014	0.0055	0.011	0.0034	-0.039
	[0.11]	[0.11]	[0.0019]	[0.0076]	[0.048]	[0.0021]	[0.046]
Treat	-91.2	-68.3	0.14		-5.21	0.12	-1.80
	[4.92]	[4.83]	[0.041]		[2.18]	[0.12]	[2.71]
Score	0.50	0.49	0.0027	0.0096	-0.046	0.0078	0.087
	[0.11]	[0.13]	[0.0020]	[0.010]	[0.047]	[0.0025]	[0.058]
Relative score	0.12	0.21	-0.00037	0.0043	0.019	-0.0029	0.00084
	[0.079]	[0.089]	[0.0012]	[0.0050]	[0.031]	[0.0015]	[0.031]
Observations	5,239	5,239	5,219	5,258	1,786	1,709	1,827

Notes: The goal of the table is to look at whether parents respond more to the absolute or relative performance information (i.e., within-class percentiles). Data sources are baseline survey, baseline test score data, the endline surveys, and endline administrative data. Each observation is a child. Standard errors are clustered at the household level. Score is the absolute score used in all other tables; relative score is the percentile rank within the class. Regressions control for school FE, grade FE, average parental years of education, parent gender, a parental education proxy used for stratification, the between-child score gap, child gender, and the baseline value of the dependent variable (baseline value not available for enrollment or experimental outcomes). Workbook difficulty choices are coded as 0 for beginner, 100 for average, 200 for advanced. Enrollment defined as being enrolled in school 1 year after the intervention; enrollment and attendance scaled to be out of 100 (so, for example, enrollment is equal to 100 if the child is still enrolled and 0 otherwise).

Online Appendix Table C.25: Summary statistics: Endline 2 sample vs. non-endline-2 sample

	Full Sample		Endline 2	Not endline 2	Endline 2 − (Not endline 2)		
	Mean	SD	Mean	Mean	Mean	Std. Error	p-val T=C
Respondent Background							
Female	0.77	0.42	0.76	0.77	-0.01	0.02	0.37
Primary education decision maker	0.92	0.27	0.92	0.93	0.01	0.01	0.31
Age	40.8	11.0	40.3	41.7	0.32	0.44	0.47
Education (years)	4.44	3.57	4.55	4.23	0.04	0.13	0.78
Respondent has secondary education +	0.11	0.31	0.11	0.1	0.01	0.01	0.62
Parent can read or write Chichewa	0.67	0.47	0.68	0.66	0.01	0.02	0.67
Respondent is farmer	0.46	0.5	0.44	0.51	-0.01	0.02	0.7
Respondent's weekly income	2,126	4,744	2,246	1,898	197	194	0.31
Household Background							
Family size (Number of children[a])	5.13	1.74	5.04	5.31	-0.05	0.07	0.47
One-parent household	0.19	0.39	0.21	0.16	0.01	0.02	0.47
Parents' average education (years)	4.66	3.25	4.75	4.49	-0.04	0.12	0.74
Any parent has secondary education +	0.18	0.38	0.18	0.17	0.02	0.01	0.24
Student Information							
Child's grade level	3.72	1.37	3.72	3.73	0	0.04	0.94
Child's age	11.6	2.68	11.6	11.7	-0.1	0.08	0.21
Child is female	0.51	0.5	0.5	0.52	-0.02	0.01	0.25
Baseline attendance	0.91	0.13	0.92	0.91	0	0	0.72
Annual per-child education expenditures	1,742	2,791	1,814	1,606	58.0	83.0	0.48
Fees paid to schools	381	1,128	417	314	-6.84	23.9	0.78
Uniform expense	576	1,019	557	611	49.9	36.1	0.17
School supplies, books, tutoring, etc.[b]	785	1,819	840	682	14.3	62.3	0.82
Any supplementary expenditures on child	0.9	0.3	0.89	0.91	-0.01	0.01	0.49
Academic Performance (Average Achievement Scores)							
Overall score	46.8	17.5	46.6	47.0	-0.74	0.46	0.11
Math score	44.9	20.2	44.8	45.1	-1.08	0.54	0.04
English score	44.2	20.1	44.0	44.6	-0.56	0.53	0.29
Chichewa score	51.2	22.5	51.1	51.5	-0.55	0.59	0.35
(Math − English) Score	0.71	19.5	0.83	0.5	-0.53	0.51	0.3
Respondent's Beliefs about Child's Academic Performance							
Believed Overall Score	62.4	16.5	62.3	62.4	-0.78	0.48	0.11
Believed Math Score	64.7	19.0	64.7	64.8	-0.94	0.55	0.09
Believed English Score	55.3	20.9	55.2	55.5	-0.71	0.62	0.25
Believed Chichewa Score	66.8	19.4	66.9	66.5	-0.1	0.6	0.87
Beliefs about (Math − English) Score	9.48	21.5	9.57	9.31	-0.23	0.63	0.71
Gaps Between Believed and True Academic Performance							
Abs Val [Believed − True Overall Score]	20.4	14.5	20.8	19.7	-0.12	0.43	0.78
Abs Val [Believed − True Math Score]	25.8	18.0	25.9	25.5	-0.1	0.52	0.85
Abs Val [Believed − True English Score]	21.4	16.4	21.8	20.6	-0.57	0.48	0.23
Abs Val [Believed − True Chichewa Score]	23.8	17.5	24.0	23.5	0.19	0.51	0.72
Abs Val [Believed − True (Math-English) Score]	22.1	17.4	22.1	22.1	-0.44	0.51	0.39
Abs Val [Believed − True Overall Score (Child1-2)]	18.7	15.1	18.9	18.3	-0.34	0.59	0.56
Beliefs about Complementarity							
Believes educ. and achievement complementary[c]	0.91	0.29	0.91	0.9	0	0.01	0.68
Sample Sizes							
Sample Size–HHs	2,634		1,722	912			
Sample Size–Kids	5,268		3,444	1,824			

Notes: Table shows difference in summary statistics between those included and not included in the endline 2 sample. Data source is baseline survey. Standard errors for the t-test of equality are clustered at the household level.

a. Counted as a child if either of the primary caregivers for the sampled children is a parent of the child.

b. Includes exercise books and pencils, textbooks and supplementary reading books, backpacks, and tutoring expenses.

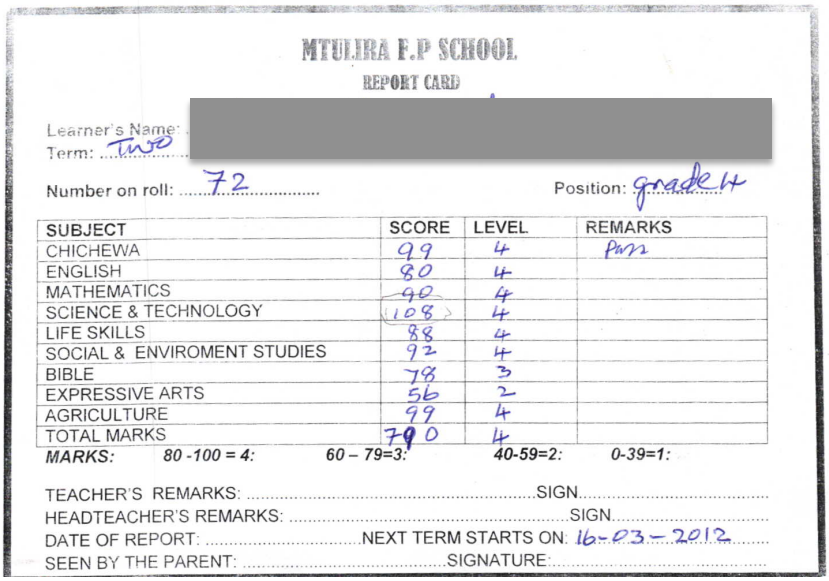
c. Respondent said that they thought the earnings of a more able child would increase "more" or "much more" than the earnings of a less able child from getting a secondary education.

Online Appendix Table C.26: Information treatment effects: Early vs. late sample

Dep. Var.	Endline beliefs	ln(English textbook WTP) - ln(Math textbook WTP)	Math workbook difficulty level	English workbook difficulty level	Secondary school lottery tickets
	(1)	(2)	(3)	(4)	(5)
Panel A. Early sample					
Treat × Score	0.39	0.016	1.37	1.37	0.031
	[0.037]	[0.0034]	[0.13]	[0.14]	[0.0077]
Score	0.33	0.0014	0.76	0.71	0.028
	[0.025]	[0.0025]	[0.093]	[0.11]	[0.0053]
Treat	-26.6	-0.19	-95.9	-75.4	
	[1.93]	[0.062]	[7.14]	[7.30]	
Observations	2,429	2,426	2,429	2,428	2,434
R-squared	0.329	0.044	0.253	0.217	0.102
Panel B. Late sample					
Treat × Score	0.44	0.011	1.31	1.17	0.037
	[0.034]	[0.0028]	[0.13]	[0.13]	[0.0073]
Score	0.29	0.0031	0.58	0.81	0.030
	[0.024]	[0.0021]	[0.092]	[0.10]	[0.0052]
Treat	-26.6	-0.10	-87.0	-63.4	
	[1.80]	[0.053]	[6.76]	[6.46]	
Observations	2,815	2,793	2,810	2,811	2,824
R-squared	0.370	0.034	0.207	0.214	0.126
p-val: Treat × Score equal across samples	0.52	0.35	0.39	0.30	0.28
Score used	Overall	Math – English	Math	English	Overall
Household FE	No	No	No	No	Yes

Notes: Data sources are baseline survey, baseline test score data, and the endline surveys. Each observation is a child. "Early sample" consists of the first set of households rolled out during the baseline survey and intervention; there was an implementation problem with the information delivered to the treatment households in this sample described in Appendix F.4. "Late sample" consists of the households rolled out after the implementation problem was fixed. The table shows that the estimates are very similar across samples and that I cannot reject equality for the estimates in the two different samples. Standard errors are clustered at the household level. Regressions control for school FE, grade FE, average parental years of education, parent gender, a parental education proxy used for stratification, the between-child score gap, child baseline performance, child gender, and whether the child is the high-performing sibling. The dependent variable in Column (1) corresponds to the parent's endline beliefs about the child's overall score on a hypothetical test taken the same day as the endline survey. Workbook difficulty choices are coded as 0 for beginner, 100 for average, and 200 for advanced. The regressions test for a change in the slope, with the prediction being that information will increase the slope (positive coefficient on *Treat* × *Score*).

D Sample baseline (non-intervention) school report card



MTULIRA F.P SCHOOL

REPORT CARD

Learner's Name: [redacted]

Term: Two

Number on roll: 72 Position: grade 4

SUBJECT	SCORE	LEVEL	REMARKS
CHICHEWA	99	4	Pass
ENGLISH	80	4	
MATHEMATICS	90	4	
SCIENCE & TECHNOLOGY	108	4	
LIFE SKILLS	88	4	
SOCIAL & ENVIROMENT STUDIES	92	4	
BIBLE	78	3	
EXPRESSIVE ARTS	56	2	
AGRICULTURE	99	4	
TOTAL MARKS	790	4	

MARKS: *80 -100 = 4:* *60 – 79=3:* *40-59=2:* *0-39=1:*

TEACHER'S REMARKS: .....SIGN.....

HEADTEACHER'S REMARKS: .....SIGN.....

DATE OF REPORT: .....NEXT TERM STARTS ON: 16-03-2012.....

SEEN BY THE PARENT: .....SIGNATURE:.....

Sample report card delivered to parents by schools in the study sample.

E Sample intervention detailed skills report card

Skills Report Card for Ndema Longwe (Standard 3)

	Ndema's Grades	Grades of other children in Ndema's class:		
English		NO	A LITTLE	YES
1. Can Ndema read simple words like class and house?	Yes	****	**	*
2. Can Ndema copy and complete simple sentences?	A little	**	****	*
Maths		NO	A LITTLE	YES
1. Can Ndema add 3-digit numbers?	Yes	*	***	***
2. Can Ndema multiply 3-digit numbers?	No	***	***	*
Chichewa		NO	A LITTLE	YES
1. Kuwelenga ndi kulemba?	A little	****	**	*
2. Kutchula mau moyenelela?	No	***	***	*

Number of kids in class is 70

Each star represents 10 kids (* = 10)

F Appendix to the experimental design (including selected survey sections)

F.1 Information Delivery Script and Selected Survey Questions

This subsection includes:

1. Baseline beliefs questions: The baseline survey questions used to measure parents' baseline beliefs about their children's academic performance

2. Information script: The script used to deliver the academic performance information to the treatment group

3. Endline "experimental outcomes": The endline survey questions used to measure the "experimental outcomes"

4. Endline beliefs: The endline survey questions used to measure parents' beliefs about their children's academic performance (specifically: hypothetical performance on a same-day test)

F.1.1 Survey questions for measuring baseline beliefs

SCRIPT: Now we are going to do a series of activities asking you about how (REFERENCE CHILD) has performed in school. Please keep in mind that we are also in touch with your child's school, so please be truthful in your response. It is completely fine if you do not know the answer to some of the questions, but please be truthful in your responses.

RA, say: So, imagine this is a new format for a report card. (**RA: Show "SAMPLE REPORT CARD".** ***Note for reader: This visual aid can be found in Online Appendix Section F.1.5.*****)** The first column shows the <u>average score that your child received across all the tests they took</u> in English, Math, and Chichewa **(RA: Point to first column)**. <u>All scores are given on a scale of 0-100</u>. If they missed an exam, the report card would just contain the child's performance from the exams they took. This may be different than what was done by their teacher. This also means that their score could be a little higher or lower than expected if they missed an easy or hard exam.
The next column shows the grades that those scores correspond to. In most schools in Malawi, the highest grade, 4 or "Excellent" is for scores 80-100, then Good (grade 3) is 60-80, Average (grade 2) is 40-60, and Needs Support (Grade 1) is 0-40. **(RA: Point to second column)**
The final column shows the position your child would receive if their class size was 100. So, if they were the top child in their class based on their test performance, they would receive a 1; if they were the bottom child in their class, they would receive a 100 **(RA: Point to third column)** The first row shows the child's performance in Maths; the second row shows the child's performance in English; the third row shows the child's performance in Chichewa; and, the final row shows the child's Average performance across those 3 subjects. Do you have any questions? (**Pause to answer questions)**

6.01 RA, Observe and record: Are you confident respondent understands?	☐1. Yes ☐2. No→ Spend more time explaining to make sure they understand
6.02. Which subject is the child who received this report card doing better in—English or Math?	☐1. English→Spend more time explaining you are confident respondent understands. ☐2. Math

RA: CONTINUE TO SCORES AND POSITIONS TABLES TO RECORD RESPONDENT'S BELIEFS ABOUT THEIR OWN CHILDREN'S SCORES; RETURN AND READ UNCERTAINTY SCRIPT WHEN INSTRUCTED

Go slowly through the next section. Ask many questions to coach the respondent.

Time Started Page: HH:MM: |__|__| : |__|__| Household ID: |__|__|__|__|__|__|

UNCERTAINTY SCRIPT (Script to be read when asking respondent about their uncertainty in row II of the Positions table and row VII of the Scores table): Imagine your child's class size is 100 and they are assigned positions based on their performance on their last report card for [SUBJECT]. The boxes represent the scores/positions received. There are 10 beans. I want you to put the beans into the boxes based on how likely you think it is that your child's score/position falls in that box (**RA: Show "POSITIONS VISUAL AID" or "SCORES VISUAL AID"; *Note for reader: These visual aids are in Online Appendix Sections F.1.6 and F.1.7***). For example, if you were sure that your child would be in positions 21-40 (receive score 21-40), you would put all the beans in there ***(RA: Put all beans in box 21-40)***. If you think they will definitely be at position 21 or lower (score 80 or lower), split all the beans between the 21-40, 41-60, 61-80, and 81-100 boxes (1 to 20, 21-40, 41-60, 61-80 boxes). ***(RA: split beans between those boxes).*** When you do this, make sure to put more beans in the boxes that you think your child is more likely to fall in; for example, if I thought my child was more likely to be in 41-60 than the other positions (scores), I would put more beans in there **(*RA: Put 2 beans in box 21-40, 4 beans in box 41-60, 2 beans in box 61-80, and 2 beans in box 81-100)***. If you have absolutely no idea what position (score) your child will have, you might split the beans evenly between all the boxes ***(RA: Put 2 beans in each box on the sheets for both parents, and leave the beans there***). Note that these are all **examples,** there is no right answer; you should just place the beans according to your beliefs. Please place the beans to show us how you think your child will perform.

Time Started Page: HH:MM: |__|__| : |__|__| Household ID: |__|__|__|__|__|__|

Positions Table

RA Instructions: Use the "Positions Visual Aid." (Note for reader: This visual aid can be found in Online Appendix Section F.1.6)
Ask questions I-V for each column before moving to the next column.

	REFERENCE CHILD 1					REFERENCE CHILD 2			
Question	6.5 Math	6.6 English	6.7 Chichewa	6.8 Overall		6.9 Math	6.10 English	6.11 Chichewa	6.12 Overall
I. First, imagine that your child was assigned a position based on their Term 2 exam performance. Do you have any idea what position (REFERENCE CHILD) would receive for [SUBJECT]?	☐1. Yes ☐2. No	☐1. Yes ☐2. No	☐1. Yes ☐2. No	☐1. Yes ☐2. No		☐1. Yes ☐2. No	☐1. Yes ☐2. No	☐1. Yes ☐2. No	☐1. Yes ☐2. No
*RA: Read **Uncertainty Script (Above).** Coach the respondent through the exercise if they are having trouble. **If the respondent said in part A that they had "no idea" but then their beans are not spread out**, probe to make sure they understand.*									
II. Uncertainty: *Record how the beans are distributed between bins.*	a. 1-20|__|__| b. 21-40 |__|__| c. 41-60|__|__| d. 61-80 |__|__| e. 81-100 |__|__|	***a.*** 1-20|__|__| ***b.*** 21-40 |__|__| ***c.*** 41-60|__|__| ***d.*** 61-80 |__|__| ***e.*** 81-100 |__|__|	a. 1-20|__|__| ***b.*** 21-40 |__|__| ***c.*** 41-60|__|__| ***d.*** 61-80 |__|__| *e.* 81-100 |__|__|	a. 1-20|__|__| ***b.*** 21-40 |__|__| ***c.*** 41-60|__|__| ***d.*** 61-80 |__|__| ***e.*** 81-100 |__|__|		***a.*** 1-20|__|__| ***b.*** 21-40 |__|__| ***c.*** 41-60|__|__| ***d.*** 61-80 |__|__| ***e.*** 81-100 |__|__|	a. 1-20|__|__| ***b.*** 21-40 |__|__| ***c.*** 41-60|__|__| ***d.*** 61-80 |__|__| ***e.*** 81-100 |__|__|	***a.*** 1-20|__|__| ***b.*** 21-40 |__|__| ***c.*** 41-60|__|__| ***d.*** 61-80 |__|__| ***e.*** 81-100 |__|__|	a. 1-20|__|__| *b.* 21-40 |__|__| ***c.*** 41-60|__|__| ***d.*** 61-80 |__|__| ***e.*** 81-100 |__|__|
III. Now, please show us what position you think [NAME] would score if you had to give your best guess.	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
V. ***RA: Observe and record**: Did the respondent 1) have an idea, or 2) have no idea and had to be forced to choose?*	☐ 1. Had an idea ☐ 2. Had absolutely no idea idea	☐ 1. Had an idea ☐ 2. Had absolutely no idea	☐ 1. Had an idea ☐ 2. Had absolutely no idea	☐ 1. Had an idea ☐ 2. Had absolutely no idea		☐ 1. Had an idea ☐ 2. Had absolutely no idea	☐ 1. Had an idea ☐ 2. Had absolutely no idea	☐ 1. Had an idea ☐ 2. Had absolutely no idea	☐ 1. Had an idea ☐ 2. Had absolutely no idea

Time Started Page: HH:MM: |__|__| : |__|__| Household ID: |__|__|__|__|__|__|

<u>Scores Table.</u> **RA, Say:** Now, as you may know, in most schools in Malawi, scores are assigned on a scale from 0-100, where 100 is the highest. They then assign a grade, where the highest grade, 4 or "Excellent" is for scores 80-100, then Good (grade 3) is 60-80, Average (grade 2) is 40-60, and Needs Support (Grade 1) is 0-40. ***RA: Point using the "Scores" visual aid. Then use the "Scores" Visual Aid to fill in the table. (Note for reader: This visual aid can be found in Online Appendix Section F.1.7.) Ask questions VI-X for each column before moving to the next column.***

<table>
<tr><td></td><td colspan="4">REFERENCE CHILD 1</td><td></td><td colspan="4">REFERENCE CHILD 2</td></tr>
<tr><td>Question</td><td>6.5 Math</td><td>6.6 English</td><td>6.7 Chichewa</td><td>6.8Overall</td><td></td><td>6.9 Math</td><td>6.10 English</td><td>6.11 Chichewa</td><td>6.12Overall</td></tr>
<tr><td>VI. Now, imagine your child is assigned a score and grade based on their Term 2 exam performance. Do you have any idea what grade OR score (REFERENCE CHILD) would receive for [SUBJECT]?</td><td>☐1. Yes
☐2. No</td><td>☐1. Yes
☐2. No</td><td>☐1. Yes
☐2. No</td><td>☐1. Yes
☐2. No</td><td></td><td>☐1. Yes
☐2. No</td><td>☐1. Yes
☐2. No</td><td>☐1. Yes
☐2. No</td><td>☐1. Yes
☐2. No</td></tr>
<tr><td colspan="10">RA, say: Now, please place the beans to show us how you think your child would score. RA: Spend a lot of time coaching. If the respondent is unfamiliar with the grading system, ask them questions like "Do you think your child is failing? How much better than failing are they doing—a little? A lot?" to try to help them get the answer. <u>Start by asking them about what grade they think their child would receive, then narrow in on the score.</u></td></tr>
<tr><td>VII. Uncertainty: Record how the beans are distributed between bins.</td><td>a. 1-20|__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20|__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20|__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20|__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td></td><td>a. 1-20|__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20|__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20|__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20|__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td></tr>
<tr><td>VIII. Now, please point to what score you think [NAME] would score if you had to give your best guess.
Answers should be in multiples of 5</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td></td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td></tr>
<tr><td>X. RA: Observe and record: Did the respondent 1) have an idea, or 2) have no idea and had to be forced to choose?</td><td>☐1. Had an idea
☐2. Had no idea</td><td>☐1. Had an idea
☐2. Had no idea</td><td>☐1. Had an idea
☐2. Had no idea</td><td>☐1. Had an idea
☐2. Had no idea</td><td></td><td>☐1. Had an idea
☐2. Had no idea</td><td>☐1. Had an idea
☐2. Had no idea</td><td>☐1. Had an idea
☐2. Had no idea</td><td>☐1. Had an idea
☐2. Had no idea</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Time Started Page: HH:MM: |__|__| : |__|__| Household ID: |__|__|__|__|__|__|

AMENDED BELIEFS TABLE

6.18: RA: Look back over beliefs and probe respondent about inconsistencies*: After probing, are there any amendments to beliefs?*	☐ 1. Yes>>Record amended beliefs in tables below ☐ 2. No>>6.25

	A. REFERENCE CHILD 1	**B. REFERENCE CHILD 2**
6.2A. *Does respondent think [NAME] is better at Math or English?*	☐ 1. Math ☐ 2. English ☐ 3. The Same	☐ 1. Math ☐ 2. English ☐ 3. The Same
6.3A *Does respondent think [NAME] is worst at Math, English, or Chichewa?*	☐ 1. Math ☐ 2. English ☐ 3. Chichewa ☐ 4. The same	☐ 1. Math ☐ 2. English ☐ 3. Chichewa ☐ 4. The same
6.4A Which child does respondent think is doing better in school?	☐ 1. REFERENCE CHILD 1 ☐ 2. REFERENCE CHILD 2	

Time Started Page: HH:MM: |__|__| : |__|__| Household ID: |__|__|__|__|__|

<table>
<tr><th></th><th colspan="4">REFERENCE CHILD 1</th><th></th><th colspan="4">REFERENCE CHILD 2</th></tr>
<tr><td>Question</td><td>6.5A. Math</td><td>6.6.A English</td><td>6.7.A.Chichewa</td><td>6.8.A. Overall</td><td></td><td>6.9.A. Math</td><td>6.10.A. English</td><td>6.11.A. Chichewa</td><td>6.12.A. Overall</td></tr>
<tr><td>I. Beans for POSITIONS</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td></td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td></tr>
<tr><td>II. Best Guess for POSITION</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td></td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td></tr>
<tr><td>III. Beans for SCORES</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td></td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td><td>a. 1-20 |__|__|
b. 21-40 |__|__|
c. 41-60|__|__|
d. 61-80 |__|__|
e. 81-100 |__|__|</td></tr>
<tr><td>IV. Best Guess for SCORES</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td></td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td><td>|__|__|__|</td></tr>
</table>

Time Started Page: HH:MM: |__|__| : |__|__| Household ID: |__|__|__|__|__|__|

	A. REFERENCE CHILD 1	B. REFERENCE CHILD 2
6.25 .RA Check Track Sheet: What standard is (REFERENCE CHILD) in?	|___|	|___|
Now, this is a sample skills report card showing how a child performed on several of the important skills areas they are learning in school. (**RA: Show "SAMPLE SKILLS REPORT CARD"; *Note for reader: This visual aid can be found in Online Appendix Section F.1.8.*)** In this first column, you can see if the teacher said a given child could do the skill. On the right side of the page, you can see how many of the child's classmates can do the skill. We will now ask you some questions about how well you think your child can do some of the skills that he/she learns in school. If the question is about multiple skills and they can do some but not others, say 2=A little. *Answers: 1=Yes, 2=A Little, 3=No, 4=Don't know, 5=Can't understand skills* *RA: Fill in one column at a time.*		
6.26 How well can your child do [MATH SKILL 1 FROM "SKILLS GUIDE" FOR STD [STD]]?	|___|	|___|
6.27 How well can your child do [MATH SKILL 2 FROM "SKILLS GUIDE" FOR STD [STD]]?	|___|	|___|
6.28 How well can your child do [ENGLISH SKILL 1 FROM "SKILLS GUIDE" FOR STD [STD]]?	|___|	|___|
6.29 How well can your child do [ENGLISH SKILL 2 FROM "SKILLS GUIDE" FOR STD [STD]]?	|___|	|___|
6.30 How well can your child do [CHICHEWA SKILL 1 FROM "SKILLS GUIDE" FOR STD [STD]]?	|___|	|___|
6.31 How well can your child do [CHICHEWA SKILL 2 FROM "SKILLS GUIDE" FOR STD [STD]]?	|___|	|___|

F.1.2 Scripts for information delivery (Treatment group only)

PROGRESS REPORT SCRIPT

RA, say: Now here is the report card, but now filled in with (REFERENCE CHILD 1/2'S) true performance in Term 2 of this year **(RA, show the respondent REFFERENCE CHILD's report card)**. REFERENCE CHILD's teacher administered [#] Exams this term. In Math they received the score [MATH SCORE] out of 100 and their grade was [MATH GRADE], for a position of [MATH POSITION]. In English they received the score [ENGLISH SCORE] out of 100 and their grade was [ENGLISH GRADE], for a position of [ENGLISH POSITION]. In Chichewa they received the score [CHICHEWA SCORE] out of 100 and their grade was [CHICHEWA GRADE], for a position of [CHICHEWA POSITION]. So, you can see that, on average, across Math, English, and Chichewa, they received score [OVERALL SCORE] out of 100, and their grade was [OVERALL GRADE], which means they would have a position of [OVERALL POSITION] in a class of 100. **RA: Ask whether respondent has any questions.**

RA: Repeat PROGRESS REPORT script once for REFERENCE CHILD 1 and once for REFERENCE CHILD 2.

I know that was a lot of information to take in. I'm going to ask you a few questions now just to make sure that I explained this clearly or whether there's anything else I need to clarify.

	REFERENCE CHILD 1	**REFERENCE CHILD 2**
6.33. Can you tell me what grades and scores your child received in Math, English, Chichewa, and Overall? *RA: Record whether the answer was correct*	☐1. *Answer was correct* ☐2. *Answer was incorrect* → ***Continue explaining until they understand***	☐1. *Answer was correct* ☐2. *Answer was incorrect* → ***Continue explaining until they understand***
6.34. What about their positions?	☐1. *Answer was correct* ☐2. *Answer was incorrect* → ***Continue explaining until they understand***	☐1. *Answer was correct* ☐2. *Answer was incorrect* → ***Continue explaining until they understand***
6.35. *(RA: Observe and Record): Which of the primary caregivers was present for the delivery of the information?*	☐1. Male primary caregiver ☐2. Female primary caregiver ☐3. Both	

F.1.3 Scripts for measuring all "experimental outcomes"

I. SECONDARY SCHOOL FEE LOTTERY

LOTTERY Description:

IPA is holding a lottery to pay for secondary school fees. We are giving each participant in the lottery 9 lottery tickets. We are then asking you to write a name on each lottery ticket. Then, in a couple of months, we will choose a winner at the office. We will put the lottery tickets from 100 of the families together. Without looking, we will then pick one of the tickets. If one of your tickets is chosen, then we will pay for four years of government school fees for secondary school for whoever's name you have written on the lottery ticket. So, one out of every 100 households will receive a scholarship for four years of government school fees for one of their children. So, let's say I had two children, Yamikani and Billy, and I wrote Billy's name on a lottery ticket. Then, if my lottery ticket was chosen, the NGO would pay for Billy's expenses while still in primary school, and for Billy's government school fees at whatever government secondary school he was admitted to. If Billy was admitted to district secondary school, the NGO would pay for his district secondary school fees; if he was admitted to CDSS, IPA would pay for his CDSS school fees. As an example, fees this year at Liwonde CDSS were 1500 per term, so if Billy were admitted there, IPA would pay 1500 kwacha per term to Liwonde CDSS; fees this year at Balaka Secondary School, a District Secondary School, were 12,000 kwacha per term, so if Billy were admitted there, IPA would pay 12,000 per term to the school. If Billy was not admitted to any government secondary school or did not want to attend, then the NGO would not pay any school fees.

TICKET DEMO: So, let's do an example to make sure you understand the concept, remember this is just an example so not how it will work in reality. Let's pretend the only people entering the lottery were you and me. We would each be given nine tickets—your tickets are white, and mine are striped. We would each write a name on the back of each ticket. *RA: Demonstrate by writing the name "Billy" on the ticket.* Then, the NGO would put all of the lottery tickets together, close their eyes, and choose one out of the hat. *RA: Demonstrate by putting all tickets together in a pile and pulling the ticket out of the hat.* Whoever's name was written on the back of the ticket would receive the secondary school fees. So, if the ticket said "Billy", Billy would get the fees. So, as you can see, my choice of which names to write on which tickets and how many tickets to give to each of my children has no effect on the chance that one of my tickets will be chosen. That is, writing "Billy" or "Yamikani" on this ticket does not change the chance that this ticket will be pulled out of the hat—the person picking out of the hat is not going to look at the names before picking. *RA: Demonstrate.* However, my choice of which name I write does affect which of my

children would receive the scholarship if I won—if I wrote Billy on all of my tickets, he would certainly be the one to receive the fees if I won; if I split my tickets between Billy and Yamikani, then there would be some chance that Billy would get the fees if I win and some chance that Yamikani would get the fees if I won.

Do you have any questions? *RA, pause to answer questions*

RA Say: Please note that winning the lottery will not change your child's chances of admission—your child's chances of admission will be exactly the same.

Questions to make sure lottery was explained clearly:

7.1. What would happen if a ticket was chosen out of the hat and it had the name Billy on it?	a. The NGO would pay for the government secondary school fees for Billy b. Other **>> RA continue explaining**
7.2. What would happen if a ticket was chosen out of the hat with the name Billy, but then Billy was not admitted to secondary school?	a. The NGO would not pay for anything for Billy b. Other **>> RA continue explaining**
7.3. What would the NGO pay for if Billy won the lottery and Billy was admitted to secondary school?	a. Billy's school fees only b. Billy's school fees + other expenses**>> RA continue explaining**
7.4. Imagine that one person splits their tickets between their two children, and another person gives all of her tickets to one child. Are those two peoples' chances of winning the lottery the same or different?	a. Different>> RA continue explaining until they understand b. The same

Actual lottery allocations:

7.5. How many tickets do you want to write (REFERENCE CHILD 1) on and how many do you want to write (REFERENCE CHILD 2) on? *RA INSTRUCTIONS: Write the selected child's name and circle the appropriate number (1 or 2) on all of the tickets. Show them to the respondent, and then put them back in the envelope and seal it.* *Give the respondent one receipt ticket and take the sealed envelope with the tickets back to the office. DO NOT LEAVE ANY TICKETS WITH A CHILD'S NAME ON THEM WITH THE RESPONDENT.*	a. [_____] tickets for [REFERENCE CHILD 1] b. [_____] tickets with [REFERENCE CHILD 2] *RA Note: Must sum to 9*

7.6. ***RA: Observe and Record:*** *Which caregiver was present for the Lottery Section?*	1. Female caregiver only→**Skip to 7.8a** 2. Male caregiver only→**Skip to 7.8a** 3. Both
7.7. ***RA: Observe and Record:*** *Did the caregivers disagree about which child to give more lottery tickets to?*	1. Yes 2. No
7.8b. Why did you choose to give more lottery tickets to [CHILD GIVEN MORE LOTTERY TICKETS IN [Q 7.5]? *RA: Don't probe: Check all that apply*	☐1. Higher-performing ☐2. More-obedient ☐3. Higher standard/older ☐4. Harder-working ☐ 5. Preferred Gender ☐7. Lower performing ☐8. So that both children have a chance of winning ☐9. Respondent's biological child ☐10. Incentive for that child to work harder in school ☐11. Increases the chlid's chances of being admitted to secondary ☐12. Older ☐13. The other sibling is a girl who might get pregnant ☐14. Other, specify:_____

7.9 Why did you decide to give [# TICKETS GIVEN TO REF CHILD 1] to [REF CHILD 1] and [# TICKETS GIVEN TO REF CHILD 2] to [REF CHILD 2]? *RA: Don't prompt: Check all that apply*	☐1. They're both my children, would feel badly not giving some tickets to both kids ☐2. Chances of winning are higher if split tickets ☐3. Wanted one child to win the lottery more than the other child ☐4.Disagreement between primary caregivers ☐5.Other, specify:_____

II. WILLINGNESS TO PAY FOR REMEDIAL TEXTBOOKS

RA, say: Now, we are going to give you the opportunity to purchase textbooks, potentially at a discounted price. We have two textbooks: Math and English, for each standard **(RA: Show the textbooks).** All the textbooks were purchased at a bookstore in Lilongwe for 1900 MKC. These are "remedial" textbooks (i.e., textbooks designed to be better for a subject your child is behind in). A question/price has already been selected for you, but you will not find out which question/price until the end of the interview. At the end of the interview, I will then tell you which question was selected and you will receive your choice for that question. For example, the first question asks if you will purchase the Math textbook if the price we choose at the end is 1900 MWK. If you answer yes and we pick that question at the end of the survey, you will need to purchase the textbook for 1900 MWK at that time; if you say no, you will not have the option to do so. Another question asks if you will purchase the textbook if the question chosen at the end of the interview is 300 MWK. If you say yes, you will need to purchase the textbook for 300; if you say no, you will not have the option to purchase the textbook. You will see that it is in your best interest to answer honestly to these questions, as you will not be able to change your response once we end this exercise. Notice that your answer **does not** affect the price that we will offer you the textbook, so this is not like bargaining, you should just be truthful about your response. We will only choose one of the questions, so you will only have the option of buying the math book **or** the English book for Reference child 1 **or** Reference child 2. Here is the math book so you can see it **(RA, Show the respondent the math textbook).**

(RA NOTE: Once the respondent answers "Yes", you do not have to keep asking them, just fill in the rows below that with "Yes").

RA, Say: First, we will start with textbooks for (REFERENCE CHILD 1).

8.7.	Imagine a child has one subject he/she is ahead in and one subject he/she is behind in. Would it be more helpful for the child's learning to buy a textbook in the subject the child is ahead in or the subject the child is behind in?	☐1. Subject ahead in ☐2. Subject behind in

8.14. **RA: For each row, say:** "If the price we draw for the **math** book at the end of this interview is [*PRICE*] MWK, will you purchase the **math** book?"					
a)	**1900**MWK	☐	1. YES	*or* ☐	2. NO
b)	**1500**MWK	☐	1. YES	*or* ☐	2. NO
c)	**1300** MWK	☐	1. YES	*or* ☐	2. NO

d)	**1100** MWK	☐	1. YES	*or*	☐	2. NO
e)	**900**MWK	☐	1. YES	*or*	☐	2. NO
f)	**700**MWK	☐	1. YES	*or*	☐	2. NO
g)	**500**MWK	☐	1. YES	*or*	☐	2. NO
h)	**300**MWK	☐	1. YES	*or*	☐	2. NO
i)	**200** MWK	☐	1. YES	*or*	☐	2. NO
j)	**100** MWK	☐	1. YES	*or*	☐	2. NO
k)	**50** MWK	☐	1. YES	*or*	☐	2. NO
l)	**25**MWK	☐	1. YES	*or*	☐	2. NO
m)	**10** MWK	☐	1. YES	*or*	☐	2. NO

RA, say: Now here is the English book for standard [STD] so you can see it **(RA, Show the respondent the English textbook)**

8.15. **RA: For each row, say:** "If the price we draw for the **English** book at the end of this interview is [*PRICE*] MWK, will you purchase the **English** book?"						
a)	**1900** MWK	☐	1. YES	*or*	☐	2. NO
b)	**1500** MWK	☐	1. YES	*or*	☐	2. NO
c)	**1300** MWK	☐	1. YES	*or*	☐	2. NO
d)	**1100** MWK	☐	1. YES	*or*	☐	2. NO
e)	**900** MWK	☐	1. YES	*or*	☐	2. NO
f)	**700** MWK	☐	1. YES	*or*	☐	2. NO
g)	**500** MWK	☐	1. YES	*or*	☐	2. NO
h)	**300** MWK	☐	1. YES	*or*	☐	2. NO
i)	**200** MWK	☐	1. YES	*or*	☐	2. NO
j)	**100** MWK	☐	1. YES	*or*	☐	2. NO
k)	**50** MWK	☐	1. YES	*or*	☐	2. NO
l)	**25** MWK	☐	1. YES	*or*	☐	2. NO
m)	**10** MWK	☐	1. YES	*or*	☐	2. NO

RA, say: Now, we will do the textbooks for (REFERENCE CHILD 2), starting with the math textbook. **(RA, Show the respondent the math textbook**.)

8.20. **RA: For each row, say:** "If the price we draw for the **math** book at the end of this interview is [*PRICE*] MWK, will you purchase the **math** book?"						
a)	**1900** MWK	☐	1. YES	*or*	☐	2. NO

b)	**1500** MWK	☐	1. YES	*or*	☐	2. NO
c)	**1300** MWK	☐	1. YES	*or*	☐	2. NO
d)	**1100** MWK	☐	1. YES	*or*	☐	2. NO
e)	**900** MWK	☐	1. YES	*or*	☐	2. NO
f)	**700** MWK	☐	1. YES	*or*	☐	2. NO
g)	**500** MWK	☐	1. YES	*or*	☐	2. NO
h)	**300** MWK	☐	1. YES	*or*	☐	2. NO
i)	**200** MWK	☐	1. YES	*or*	☐	2. NO
j)	**100** MWK	☐	1. YES	*or*	☐	2. NO
k)	**50** MWK	☐	1. YES	*or*	☐	2. NO
l)	**25** MWK	☐	1. YES	*or*	☐	2. NO
m)	**10** MWK	☐	1. YES	*or*	☐	2. NO

RA, say: Now we will do the English textbook for (REFERENCE CHILD 2). **(RA, Show the respondent the English textbook)**

8.21. **RA: For each row, say:** "If the price we draw for the **English** book at the end of this interview is [*PRICE*] MWK, will you purchase the **English** book?"						
a)	**1900** MWK	☐	1. YES	*or*	☐	2. NO
b)	**1500** MWK	☐	1. YES	*or*	☐	2. NO
c)	**1300** MWK	☐	1. YES	*or*	☐	2. NO
d)	**1100** MWK	☐	1. YES	*or*	☐	2. NO
e)	**900** MWK	☐	1. YES	*or*	☐	2. NO
f)	**700** MWK	☐	1. YES	*or*	☐	2. NO
g)	**500** MWK	☐	1. YES	*or*	☐	2. NO
h)	**300** MWK	☐	1. YES	*or*	☐	2. NO
i)	**200** MWK	☐	1. YES	*or*	☐	2. NO
j)	**100** MWK	☐	1. YES	*or*	☐	2. NO
k)	**50** MWK	☐	1. YES	*or*	☐	2. NO
l)	**25** MWK	☐	1. YES	*or*	☐	2. NO
m)	**10** MWK	☐	1. YES	*or*	☐	2. NO

III. CHOICE OF LEVEL-SPECIFIC WORKBOOKS

RA, say: Now, please tell us how well you think your child would score if they took a test today in [SUBJECT].
RA: Have respondent point on the SCORES and POSITIONS visual aids. Use intervals of 5 for scores

	REFERENCE CHILD 1		REFERENCE CHILD 2	
	11.1. Position	11.2. Score	11.3. Position	11.4. Score
1. Math	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
2. English	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
3. Chichewa	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
4. Overall	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|

RA, say: To thank you for participating in our survey, we are giving you the choice between several free packets with exercises for your children. We have three in math and three in English for each standard. You can choose one of each for (REFERENCE CHILD 1) and for (REFERENCE CHILD 2). For each standard, the "Beginners" math packet is the best packet for students who are struggling in math. So, it has problems that are designed to help students who are struggling to catch up with their class. The "Average" Math packet is the best packet for students who are average in math, with problems chosen for students of that level. The "Advanced" Math packet is the best packet for students who are doing very well and who would benefit from more advanced problems. Similarly, the "Beginners" English packet is the best workbook for students who are struggling in English and contains problems that are designed to help students who are struggling to catch up with their class. The "Average" English packet is the best workbook for students who are average in English, with problems chosen for students of that level. The "Advanced" English packet is the best for students who are very good at English.

	I. REFERENCE CHILD 1	**II. REFERENCE CHILD 2**
11.7 Which of the packets do you want for [NAME] for Math?	☐1. Advanced ☐2. Average ☐3. Needs Support	☐1. Advanced ☐2. Average ☐3. Needs Support
11.8. Which of the packets do you want for [NAME] for English?	☐1. Advanced ☐2. Average ☐3. Needs Support	☐1. Advanced ☐2. Average ☐3. Needs Support

RA: Give the 4 packets that the respondent chose to the respondent.

F.1.4 Scripts for measuring endline beliefs

RA, say: Now, please tell us how well you think your child would score if they took a test today in [SUBJECT].
RA: Have respondent point on the SCORES and POSITIONS visual aids. Use intervals of 5 for scores

	REFERENCE CHILD 1		REFERENCE CHILD 2	
	11.1. Position	11.2. Score	11.3. Position	11.4. Score
1. Math	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
2. English	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
3. Chichewa	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
4. Overall	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|

F.1.5 Sample skills report card

Report Card

Name: NDEMA LONGWE **Standard:** 2

	Score	Grade	Position
Maths:	75/100	3	10/100
English:	33/100	1	71/100
Chichewa:	67/100	3	38/100
Overall:	58/100	2	52/100

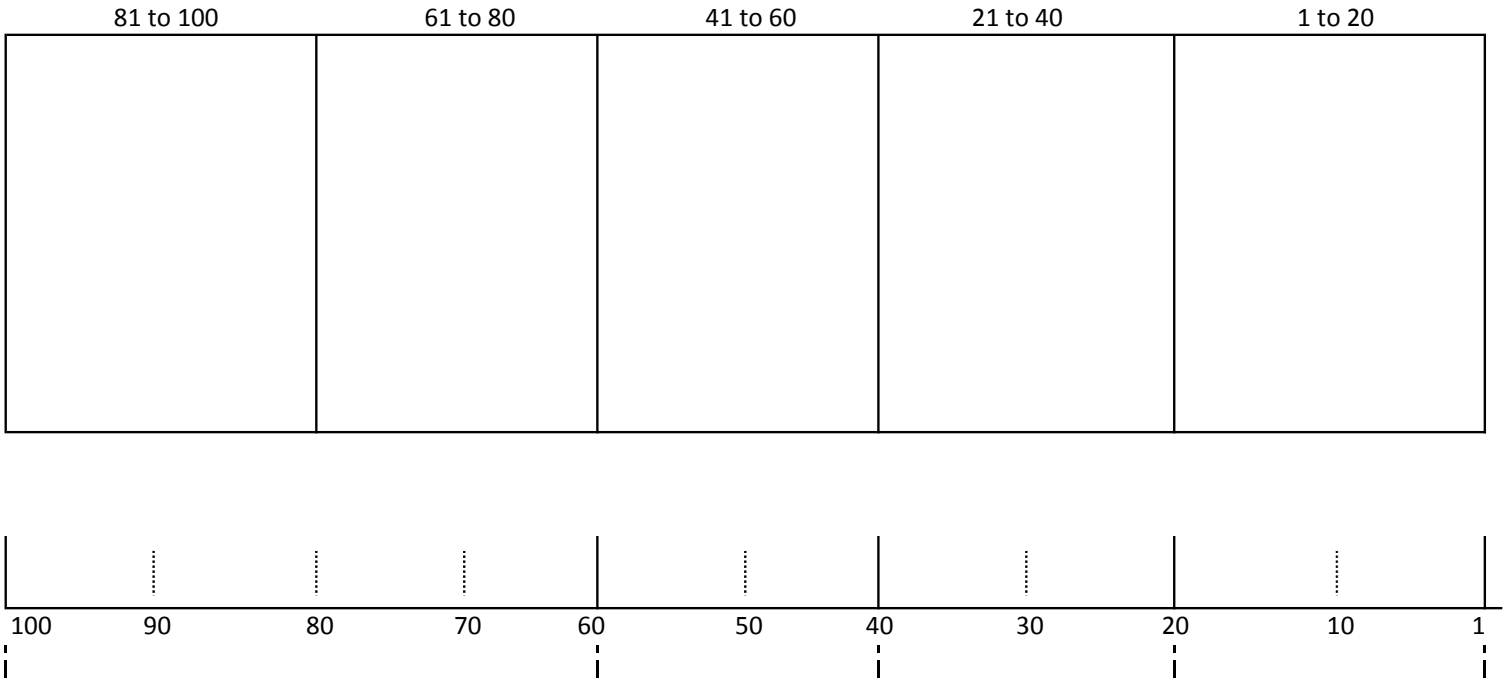
Number of Exams Administered in Class: 3

Grades
1 = Needs support
2 = Average
3 = Good
4 = Excellent

F.1.6 Positions visual aid

QUESTIONS: POSITIONS TABLE (6.5-6.12), 11.2, 11.4

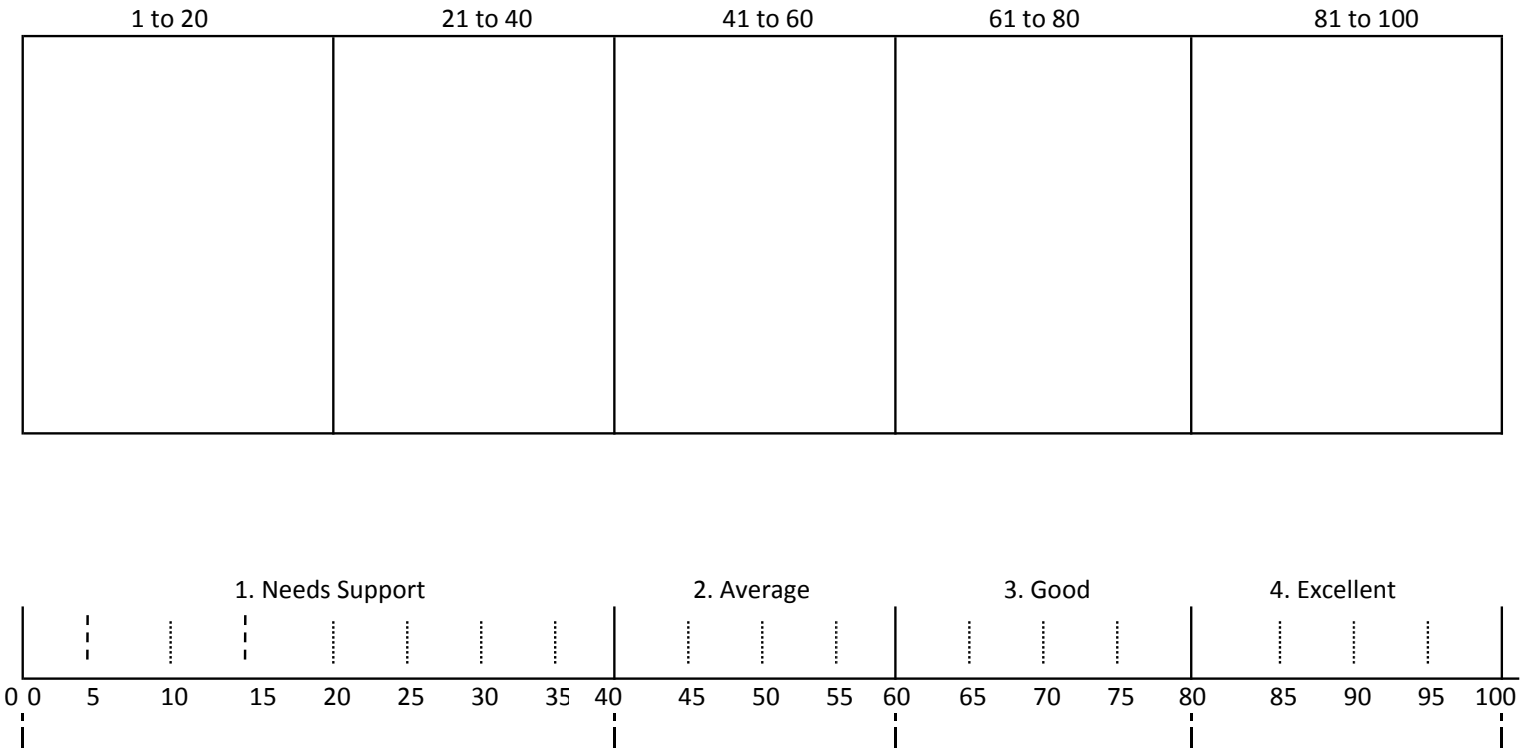
POSITIONS VISUAL AID



F.1.7 Scores visual aid

QUESTIONS: SCORES TABLE (6.5-6.12), 6.21, 6.24, 11.1, 11.3

SCORES VISUAL AID



F.1.8 Sample skills report card

Skills Report Card for Ndema Longwe (Standard 3)

	Ndema's Grades	Grades of other children in Ndema's class:		
English		**NO**	**A LITTLE**	**YES**
1. Can Ndema read simple words like class and house?	Yes	****	**	*
2. Can Ndema copy and complete simple sentences?	A little	**	****	*
Maths		**NO**	**A LITTLE**	**YES**
1. Can Ndema add 3-digit numbers?	Yes	*	***	***
2. Can Ndema multiply 3-digit numbers?	No	***	***	*
Chichewa		**NO**	**A LITTLE**	**YES**
1. Can Ndema read and write?	A little	****	**	*
2. Can Ndema read simple words like school, house, and class?	No	***	***	*

Number of kids in class is 70

Each star represents 10 kids (* = 10)

F.1.9 Skills guide

SKILLS GUIDE

Std	Subject	Skill #	Skill
2	Math	1	Count, write, and recognize numbers?
2	Math	2	Add two-digit numbers?
2	English	1	Say the letters of the alphabet in English?
2	English	2	Copy and complete simple sentences?
2	Chichewa	1	Kuwelenga/kunena a, e, I, or u
2	Chichewa	2	Kuwelenga nkhani
3	Math	1	Add three-digit numbers?
3	Math	2	Multiply two-digit numbers?
3	English	1	Read simple words like school, class, house?
3	English	2	Copy and complete simple sentences?
3	Chichewa	1	Kuwelenga ndi kulemba
3	Chichewa	2	Kutchula mau moyenelela
4	Math	1	Add 4-digit numbers?
4	Math	2	Multiply 4-digit numbers?
4	English	1	Read paragraphs and stories?
4	English	2	Describe things, like illustrations or what they do every day?
4	Chichewa	1	Kulemba ndi kuwelenga molondola
4	Chichewa	2	Kulemba Kalata
5	Math	1	Add and subtract 6 digit numbers?
5	Math	2	Do multiplication of 3-digit and 2-digit numbers?
5	English	1	Construct simple sentences?
5	English	2	Answer comprehension questions based on what they have read?
5	Chichewa	1	Kutchula mau molondola
5	Chichewa	2	Kulemba ndi kuwelenga molondola
6	Math	1	Add and subtract 7 digit numbers?
6	Math	2	Multiply 4-digit numbers?
6	English	1	Construct simple sentences?
6	English	2	Answer comprehension questions based on what they have read?
6	Chichewa	1	Kulemba chiganizo molondola
6	Chichewa	2	Kulemba ndikuwelenga molondola

F.2 Endline data collection

Selection of endline survey sample: The baseline survey and intervention were rolled out over roughly 2 months. The endline survey sample was drawn from the households that were visited in the first half of the rollout ("early sample") since the treatment households in this group already needed to be revisited (see Online Appendix Section F.4), and so data collection costs were lower in that sample. Of the 1,200 households in the early sample, I randomly selected 912 for the endline sample, oversampling treatment households due to their lower data collection costs. As shown in Online Appendix Table C.25, the endline sample is similar to the rest of the sample in terms of observables.

Selection of attendance data sample: To gather attendance data, we gave all of the schools in the sample templates to record the data for the month following the intervention so that the data would be matchable to other data from the sample. However, many schools failed to use the templates, and so we only ended up gathering the data from classrooms covering 35% of the sample. Selection into having attendance data is unrelated to treatment, and the schools for which we have data do not differ on observable characteristics from the full sample.

Additional dropout data: The primary dropout measure is from the endline survey. However, at the time of the endline survey, we were also able to gather dropout data directly from a small subset (10%) of schools. I use this alternative measure to validate the survey data results.

F.3 Test score data

The academic performance measures used in this paper consist of average performance measures across all tests administered by schools during term 2 of the 2011-12 schoolyear for students in the sample, specifically, the average percent score (an absolute measure), the grade that that score represented on the standard Malawian grading scale, and the within-class percentile ranking. The Malawian grading scale is an absolute measure, where 1 (the lowest grade) corresponds to 0-40, 2 to 40-60, 3 is 60-80, and 4 is 80-100. Children who get an overall grade of 1 need to repeat the grade at the end of the year.

The tests included both "continuous assessments," which were periodic exams administered during the term, and terminal exams, which were administered at the end of the term. For both types, test questions are chosen by teachers from lists of standardized questions contained in the standardized curriculum books given to all schools by the Malawi Ministry of Education. To create the averages used in the report cards and the empirical analysis, I use the Malawian Ministry of Education's grading guidelines to create weighted averages, where the weights are 40%/60% (grades 5-6), 60%/40% (grades 3-4), and 100%/0% (grade

2) for continuous assessments and terminal exams, respectively. If a class only offered continuous assessments (or terminal exams), the score used is 100% continuous assessments (or terminal exams). All continuous assessments were combined into an unweighted average. If a student missed an exam, it was not included in their average. Parents were informed of this and informed that it could lead to bias in their child's score if tests varied in difficulty and their child missed a particularly easy or hard exam. This could differ from the method used by teachers, who sometimes will replace a child's score with a 0 if they missed the exam.

Within-class percentile measure: In addition to absolute measures, the intervention delivered a within-class percentile ranking. The measure used was "position ranks," which are equal to 100 minus the percentile. This statistic was used instead of percentiles because it is easier for parents in Malawi to understand given a long history of its use in schools. Parents' beliefs were also elicited about these "position ranks." For simplicity, I refer to this relative ranking as a "percentile" throughout the paper, and convert position rankings to percentiles for the analysis.

F.4 Absolute vs. relative performance and survey implementation

Absolute and relative performance are very highly correlated (correlation of 0.8). As such, one can think of them as together effectively providing a single shock to beliefs. The reasons I chose to offer both during the intervention as opposed to just one were, first, qualitative interviews suggested that combining both helped parents to understand the information, strengthening the quality of the signal. Second, it was unclear *ex ante* which one parents would care about more. Thus, I wanted to use the data to provide suggestive evidence of which was more important so that I could focus on that one for the analysis.

From an *ex post* perspective, the main results are robust to the use of either measure (see Online Appendix Tables C.3, C.4, and C.5 which show the main results in the paper using relative performance). So the choice of which results to focus on in the paper is not very substantive. I choose to focus on absolute performance in the analysis for two reasons. First, parents appear to respond more to absolute than to relative performance. For example, if one simultaneously analyzes responses to the absolute and relative beliefs shocks, the absolute shock responses are stronger, as one can see in Online Appendix Table C.24. Second, there was an implementation problem with the relative performance information delivered to the first 595 treatment households. The absolute performance information they received was correct, but they received two pieces of incorrect relative performance information. For one child, in the space on the report card for true overall relative performance, their Chichewa relative performance was listed (which has a correlation of 0.83 with the true overall), and for the other child, in the space for math relative performance, their English relative performance was listed (correlation of 0.55 with true math). All results are robust to

dropping the treatment households (and corresponding controls) that received the incorrect information (see Online Appendix Table C.26; one cannot reject equality across samples for any results). Households given incorrect information were revisited at the end of the study to deliver the correct information.

G Sample information intervention report card

Report Card

Name: NDEMA LONGWE **Standard:** 2

	Score	Grade	Position
Maths:	75/100	3	10/100
English:	33/100	1	71/100
Chichewa:	67/100	3	38/100
Overall:	58/100	2	52/100

Number of Exams Administered in Class: 3

Grades
1 = Needs support
2 = Average
3 = Good
4 = Excellent

Note: "Positions" are a measure of children's relative performance within their classes, equal to 100 minus the percentile. For ease of interpretation, the measure is converted to percentiles for the analysis. See Online Appendix Section F.3 for details.

H BDM methodology for measuring textbook WTP

Sample price list

Surveyor: For each row, say: "At the end of the interview, if the randomly selected textbook is the **math** book for [*NAME*] and the randomly selected price is [*PRICE*] MWK, will you purchase the book?"					
a)	**1900**MWK	☐ 1. YES	*or*	☐ 2. NO	
b)	**1700**MWK	☐ 1. YES	*or*	☐ 2. NO	
c)	**1500**MWK	☐ 1. YES	*or*	☐ 2. NO	
d)	**1300** MWK	☐ 1. YES	*or*	☐ 2. NO	
e)	**1100** MWK	☐ 1. YES	*or*	☐ 2. NO	
f)	**900**MWK	☐ 1. YES	*or*	☐ 2. NO	
g)	**700**MWK	☐ 1. YES	*or*	☐ 2. NO	
h)	**500**MWK	☐ 1. YES	*or*	☐ 2. NO	
i)	**300**MWK	☐ 1. YES	*or*	☐ 2. NO	

Description of methodology

Surveyors began by reading a description to parents of how the BDM methodology would work and doing a short demo. Extensive pretesting was conducted to ensure that all parents would understand this introduction. Surveyors then read parents a list of prices for the textbook. For each price, the surveyor would ask the respondent whether she would commit to purchase the textbook at that price if that price was randomly chosen at the end of the survey. So, for example, the first question asked the respondent whether she would purchase the textbook if the randomly chosen price was 1,900 Malawi Kwacha (MWK), the textbook's market price. The next question repeated the question for 1,700 MWK; the next for 1,500 MWK; etc. The procedure was repeated for two different textbooks, Math and English, for each child, and then one child, price, and textbook was randomly chosen at the end of the survey. If the parent's WTP for the chosen textbook was higher than or equal to the randomly chosen offer price, the parent would purchase the textbook.

I Estimation of the return to a secondary school lottery ticket, by child performance

Define p_i as the probability of admission to secondary school for a child of performance type i (either high or low); Y_i^S and Y_i^{NS} as earnings with and without secondary school, respectively; n^{work} as the expected (discounted) number of years the child would work after secondary school; and n^{sec} the expected (discounted) length of secondary school. The expected net return of the lottery ticket to a child of type i is thus $p_i(n^{work}(Y_i^S - Y_i^{NS}) - n^{sec}Y_i^{NS})$. To estimate this return, I use parents' beliefs from the baseline survey about the earnings return and probability of admission to secondary by student performance to estimate Y_i^S, Y_i^{NS}, p_i, and conservatively assume that n^{work} is 10 (most people work longer than that, as the average lifespan in Malawi is 62 years), and n^{sec} is 4. This calculation yields that, on average, parents perceive the return to secondary to be over 300% higher for students in the top performance decile relative to the bottom. Note that this calculation does not account for the fact that parents also perceive that higher performers have a higher chance of completing secondary school conditional on admission; taking this into account would make the perceived return for a higher-performing student relative to for a lower-performing student even higher.

J Results for secondary outcomes

In the endline survey, I also collected data on two outcomes which I considered secondary because I did not have *ex ante* hypotheses that there would be effects or because expected power was low: transfers across schools, and non-monetary investments such as giving the child fewer chores or providing homework assistance. For completeness, these results are presented in Online Appendix Table C.19. Parents indicated *ex ante* that non-monetary investments would respond to their children's performance, but expected power was low since it is difficult to measure these investments cleanly. I find positive average treatment effects, but no significant impact on the slope. For transfers across schools, parents did not indicate *ex ante* that this margin would respond. However, information increases transfers (defined as an indicator that the child transferred schools, not conditional on enrollment) by 50%, from 6% to 9%. Although there is no change in the slope on performance, heterogeneity in the preferred slope by school type could explain this. At low-quality schools, finding out a child is doing well might make it worth the effort costs of changing him to a better school, so transfers would be positively sloped with performance. In contrast, at high-quality schools, finding out a child is doing poorly could indicate a poor match, and so transfers would have the opposite slope. Indeed, if we look at the results separately by school quality (proxied by school-average achievement), there are slope effects, with the slope becoming more positive at low-quality schools and more negative at high-quality schools (Online Appendix Table C.21). Of course, this is just one of many potential explanations – and it implicitly assumes that parents know school quality, which may not be the case – but the results are suggestive.

K Discussion of the absence of an ATE for enrollment

Parents on average overestimate their children's performance at baseline, and, for enrollment, invest more in their higher performers. This suggests that providing information might decrease enrollment. However, we do not find a significant effect. There are several potential (non-mutually-exclusive) explanations. First, uncertainty in the control group may decrease investment, akin to uncertainty dampening investment in risky assets. However, I do not observe a positive average level effect for the parents who had more accurate beliefs at baseline, though the power of the test is low (see Panel B of Appendix Table A.1). Second, parents may already be spending as much as possible on education, and so the effect of information is primarily on the allocation of spending, not the level. Unfortunately, this channel is difficult to test. Third, parents' reported beliefs may be biased upwards somewhat relative to true beliefs. This channel is also difficult to test. Fourth, parents could respond more to positive than to negative information; I explore this channel in detail below. Finally, we may lack statistical precision.

Result: Investments respond more to positive than negative shocks.

Online Appendix Table C.18 shows the results from estimating equation 6, fully interacted with a dummy for receiving a positive information shock ($A_{ij} > \tilde{A_{ij}}$). The model is estimated for all outcomes for which (a) one direction of shock is unambiguously positive (e.g., the secondary school lottery depends on between-child performance and so neither direction is "positive"; thus, that outcome is not included); and (b) there is a treatment effect on the slope in the full sample. The change in slope (coefficient on $Treat \times Score$) is larger for parents who receive positive information shocks.[38] For enrollment, precision is lacking, but the magnitude of the coefficient is large, suggesting that this channel could help explain the lack of negative ATE for enrollment.

L Mechanisms: The role of uncertainty in beliefs

My primary analyses show that information increases the slope of investments on true performance, thus suggesting that the slope was attenuated at baseline. As discussed in Section I, both inaccuracies in the mean of baseline beliefs and uncertainty of baseline beliefs could cause that baseline attenuation. A reasonable question is thus whether the channel for the treatment effects is an effect on the mean or on the uncertainty of beliefs. The analysis of the channels is suggestive in nature, since I did not experimentally vary uncertainty separately from the mean, nor (for budget reasons) did I measure uncertainty at endline. Under an uncertainty channel, uncertainty could decrease the preferred slope of investments as a function of mean *beliefs*, since parents may not want to invest as steeply based on their mean beliefs if their beliefs are uncertain.[39] The attenuation of preferred investments on beliefs would then cause attenuation of actual investments on *true* performance – which is the attenuation that has been the focus of the analysis so far. In contrast, under the channel of inaccurate means, the slope of investments as a function of mean beliefs is not attenuated; rather, the attenuation of investments on true performance stems from the fact that, because beliefs are inaccurate, they themselves are attenuated functions of true performance. As a result, one empirical signature of the uncertainty channel is attenuation of investments on *beliefs* themselves; to assess uncertainty's role, I test whether information increases the slope of investments on beliefs. I use two approaches; both suggest that the primary mechanism for reallocations across *types* of investments (e.g., difficulty levels of workbooks) is changes to the mean/accuracy of beliefs, but that changes to the uncertainty of beliefs matter more

[38] It would potentially be concerning if the positive information shocks were larger, but that is not the case: The absolute gap between believed and true performance is roughly 40% smaller for the positive information shock sample. Another potential concern is that some actions are bounded (e.g., one cannot choose a less difficult workbook than beginner), but restricting the sample to parents whose predicted behavior (based on baseline beliefs) is in the middle of the range of potential outcomes yields similar results.

[39] See Appendix B.2 for a framework yielding this prediction.

for the larger investments that proxy more for the *level* of investment.

The first approach looks at the treatment effect on the slope for those who have relatively accurate beliefs at baseline. For this group, there is no belief accuracy effect of information (since beliefs were accurate to begin with). Any slope change therefore will likely represent an uncertainty effect. Panel A of Online Appendix Table C.20 shows the results of estimating equation 6 for parents whose beliefs regarding their children's performance were within 10 points of the true score. For the smaller investments, such as workbooks, the slope for these parents changes a little (i.e., there is a small uncertainty effect), but the effect is only 30% of the magnitude – and significantly different from – the change in slope in the full sample. This suggests that the effect presented earlier for the full sample is driven primarily by changes to belief accuracy. This is not surprising, since the preferred investment function was already steeply sloped in the control group. For the larger investments, on the other hand, the uncertainty effects are larger, with effects in the accurate beliefs sample representing 50% of the coefficient estimated in the full sample for the lottery, and 100% for enrollment. Of course, a key caveat to interpretation is that parents with accurate beliefs could be different from other parents; for example, they could have more certain beliefs.

A second approach is to test whether the heterogeneity in the treatment effect by performance is equal and opposite to the heterogeneity by baseline beliefs. Suppose preferred investments as a function of baseline beliefs take the form $\beta_0 + \beta_1\alpha$. If information does not change the *preferred* slope, this means that information simply moves parents along the preferred function by the amount of the information shock $(a - \alpha)$. In that case, the treatment effect would be $\beta_1(a-\alpha)$, and the coefficients on $Treat \times a$ and $Treat \times \alpha$ would be equal and opposite: β_1 and $-\beta_1$, respectively. If, instead, the magnitude of the coefficient on $Treat \times a$ is larger than that of $Treat \times \alpha$, it suggests that beliefs about academic performance are more important to treatment parents' investments than to control parents', i.e., the slope of investments on beliefs has increased. To see this, denote the slope of the investment function in the control (treatment) group β_1^C (β_1). Parent i with baseline beliefs α_i and true performance a_i would have an investment of $s^C(\alpha_i) = \beta_0^C + \beta_1^C\alpha_i$ in the control group, and $s(a_i) = \beta_0 + \beta_1 a_i$ in the treatment group. Thus, the treatment effect as a function of a and α is $\tau(a_i, \alpha_i) = s(a_i) - s^C(\alpha_i) = (\beta_0 - \beta_0^C) + \beta_1 a_i - \beta_1^C\alpha_i$, and so heterogeneity in the treatment effect by a identifies β_1 and heterogeneity by α identifies $-\beta_1^C$.

Panel B of Online Appendix Table C.20 shows that the results are consistent with the previous test, since the lottery and enrollment are the only investments where we can reject that the coefficients are equal and opposite.[40]

[40]Note that this test can also be seen as a test for whether it would be appropriate to use a "beliefs shock" specification for analyzing the treatment effects of information (i.e., a specification that looks at treatment effect heterogeneity by $a-\alpha$), since that specification assumes that the coefficients on $Treat \times a$ and $Treat \times \alpha$

To assess whether these slope changes do, in fact, reflect uncertainty, I can look at heterogeneity in both of the above tests by a baseline measure of the uncertainty of beliefs. Power is low and so the results are somewhat inconclusive; reassuringly, however, the only coefficient significant at the 10% level (English workbooks) does suggest that the slope increases more for parents with more uncertain beliefs. See Online Appendix Table C.23.

This section focused on a specific effect of uncertainty on investments, namely, whether changes to uncertainty contributed to the core treatment effects analyzed in this paper: the treatment effects of information on the alignment of investments with performance. Uncertainty can also affect investments in other ways that are not the focus of this paper (see, for example, Bobba and Frisancho (2016)).

are equal and opposite. Since that assumption is rejected for the lottery and primary school enrollment, the "beliefs shock" specification is not appropriate for examining those outcomes, but it would be for the other outcomes. For completeness, results on heterogeneity by "beliefs shock" are shown in Online Appendix Table C.22. For the investments where the assumption was not rejected, the results are consistent.