

Programs used to run the experiment, datasets, and variable definitions for Measuring Success in Education: The Role of Effort on the Test Itself

### Programs used to run the experiment

In the U.S., the experiment was run using Qualtrics. The instructions are slightly different in each school because students identified themselves using different numbers in each place. The Qualtrics files for each school are:

MSIE qualtrics US school 1 control.qsf  
MSIE qualtrics US school 1 treatment.qsf  
MSIE qualtrics US school 2 control.qsf  
MSIE qualtrics US school 2 treatment.qsf

In Shanghai, the experiment was conducted in Z-tree. The Z-tree files are:

MSIE Shanghai schools control.ztt  
MSIE Shanghai schools treatment.ztt

### Datasets, code, and variable definitions

All datasets and programs are in Stata format.

The code used to produce the output shown in all tables is provided in MSIE AERI tables.do.

The code used to produce the figures is provided in MSIE AERI figures.do. The one exception is Figure A.1, which is produced in latex. The tex file used to produce this figure is Test\_Effort\_2019-05-10\_Appendix\_Figure\_Effort.tex.

The do files call the following datasets:

MSIE\_AERI.dta (level of observation: student  $i$ ):

**age**: age of the student in years

**agemissing**: A dummy variable that equals 1 if the student's age is missing, and equals 0 if not.

**asian**: A dummy variable that equals 1 if the student's ethnicity is Asian, and equals 0 if not.

**black**: A dummy variable that equals 1 if the student's ethnicity is African-American, and equals 0 if not.

**entrance:** For Shanghai students only. The student's raw score on the Shanghai 2015 Senior High School Entrance exam.

**female:** A dummy variable that equals 1 if the student is female, and equals 0 if the student is male.

**group:** group ID number. This is the variable over which Treatment and Control were randomized.

**hisp\_nw:** A dummy variable that equals 1 if the student's ethnicity is nonwhite Hispanic, and equals 0 if not.

**hisp\_white:** A dummy variable that equals 1 if the student's ethnicity is White Hispanic, and equals 0 if not.

**levelgrp:** A text version of the school-track of the student. This variable is used only in the code to produce Figure 1.

**mcas7:** For U.S. school 1 students only. The student's raw score on the 7th grade Massachusetts Comprehensive Assessment System mathematics assessment.

**other:** A dummy variable that equals 1 if the student's ethnicity is other than White, African-American, White Hispanic, nonwhite Hispanic, or Asian; and equals 0 if not.

**q1-q25:** The student's response to questions 1 through 25, respectively. These variables are used only in the code to produce Figure 2.

**q1m-q25m:** Dummy variables that equal 1 if the student did not attempt questions 1 through 25, respectively. These variables are used only in the code to produce Figure A.4.

**qa:** The number of questions attempted by the student (0 to 25).

**qc\_pcta\_pct:** The percentage of questions that a student attempted that were answered correctly (0 to 1).

**school:** The school the student attends:

us school 1

us school 2

shanghai school 1

shanghai school 2

shanghai school 3

shanghai school 4

**score:** The student's raw score on the 25 question PISA test used in the experiment (0 to 25).

**score9q:** The student's raw score on the nine questions on the PISA test used in the experiment that were used on the official 2012 PISA (0 to 9). This is the subset of questions that have been administered on an official PISA in both the U.S. and Shanghai.

**sh\_school1:** A dummy variable that equals 1 if the student attends Shanghai school 1.

**sh\_school2:** A dummy variable that equals 1 if the student attends Shanghai school 2.

**sh\_school3:** A dummy variable that equals 1 if the student attends Shanghai school 3.

**sh\_school4:** A dummy variable that equals 1 if the student attends Shanghai school 4.

**ssat\_quant:** For U.S. school 2 students only. The student's raw score on the Quantitative Secondary School Admissions Test.

**t:** A dummy variable that equals 1 if the student is assigned to the treatment group, and equals 0 if the student is assigned to the control group.

**t2:** a text version of the treatment indicator. The variable equals either "baseline" or "treatment".

**t2018:** A dummy variable that equals 1 if the student was in the 2018 wave, and equals 0 if the student was in the 2016 wave.

**test\_ms:** A dummy variable that equals 1 if the student's baseline standardized exam score is missing, and equals 0 if not.

**test\_s:** The student's baseline exam score, standardized within sample separately for each exam (the 7th grade Massachusetts Comprehensive Assessment System mathematics assessment, the Quantitative Secondary School Admissions Test, and the Shanghai 2015 Senior High School Entrance exam).

**us:** A dummy variable that equals 1 if the student attends school in the U.S., and equals 0 if the student attends school in Shanghai.

**us\_school1\_hon:** A dummy variable that equals 1 if the student is in the honors mathematics track at U.S. school 1.

**us\_school1\_reg:** A dummy variable that equals 1 if the student is in the regular mathematics track at U.S. school 1.

**us\_school2\_hon:** A dummy variable that equals 1 if the student is in the honors mathematics track at U.S. school 2.

**us\_school2\_reg:** A dummy variable that equals 1 if the student is in the regular mathematics track at U.S. school 2.

**us\_t:** The interaction between **us** and **t** ( $\mathbf{us} \times \mathbf{t}$ ).

**white:** A dummy variable that equals 1 if the student's ethnicity is White, and equals 0 if not.

MSIE\_AERI\_ellnon10.dta (level of observation: student  $i$ ):

All variables are as defined in MSIE\_AERI.dta, except:

**ell:** A dummy variable that equals 1 if student is in the ELL (English Language Learners) program, and equals 0 if not.

**non10:** A dummy variable that equals 1 if student is not in the 10<sup>th</sup> grade, and equals 0 if the student is in the 10<sup>th</sup> grade.

MSIE\_AERI\_qlevel.dta (level of observation: question  $q$  for student  $i$ ):

All variables are as defined in MSIE\_AERI.dta, except:

**qa:** A dummy variable that equals 1 if student  $i$  attempted question  $q$ , and equals 0 if not.

**qc:** A dummy variable that equals 1 if student  $i$  answered question  $q$  correctly, and equals 0 if not.

**question:**

correct\_byQ.dta:

**mc:** A dummy variable that equals 1 if the question is multiple choice, and equals 0 if not.

**open:** A dummy variable that equals 1 if the question is free answer (fill in the blank), and equals 0 if not.

**question:** The number of the question on the test used in the experiment (1 to 25). This indicates where the question appears in the test.

**tot:** the percentage of U.S. students who answered the question correctly when it was administered on an official PISA.