Online Appendix: Childhood Confidence, Schooling, and the Labor Market: Evidence from the PSID

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Appendix A contains supplementary tables and figures. Appendix B describes the variables that make up each index used as an outcome or control variable in our main analysis and details index construction. Appendix C describes how our measures of childhood over- and under-confidence in math correlate with a range of children's attitudes towards math and school. Appendix D compares our results for over- versus under-confidence, and Appendix E provides more detail on our measures of childhood personality, teacher and parent beliefs and investment, and elementary/middle school quality. Finally, Appendix F outlines the alternate definitions of biased beliefs in math that we use in our robustness checks.

A   Supplementary Figures and Tables

Figure A1: Distribution of the degrees of over- and under-confidence measure
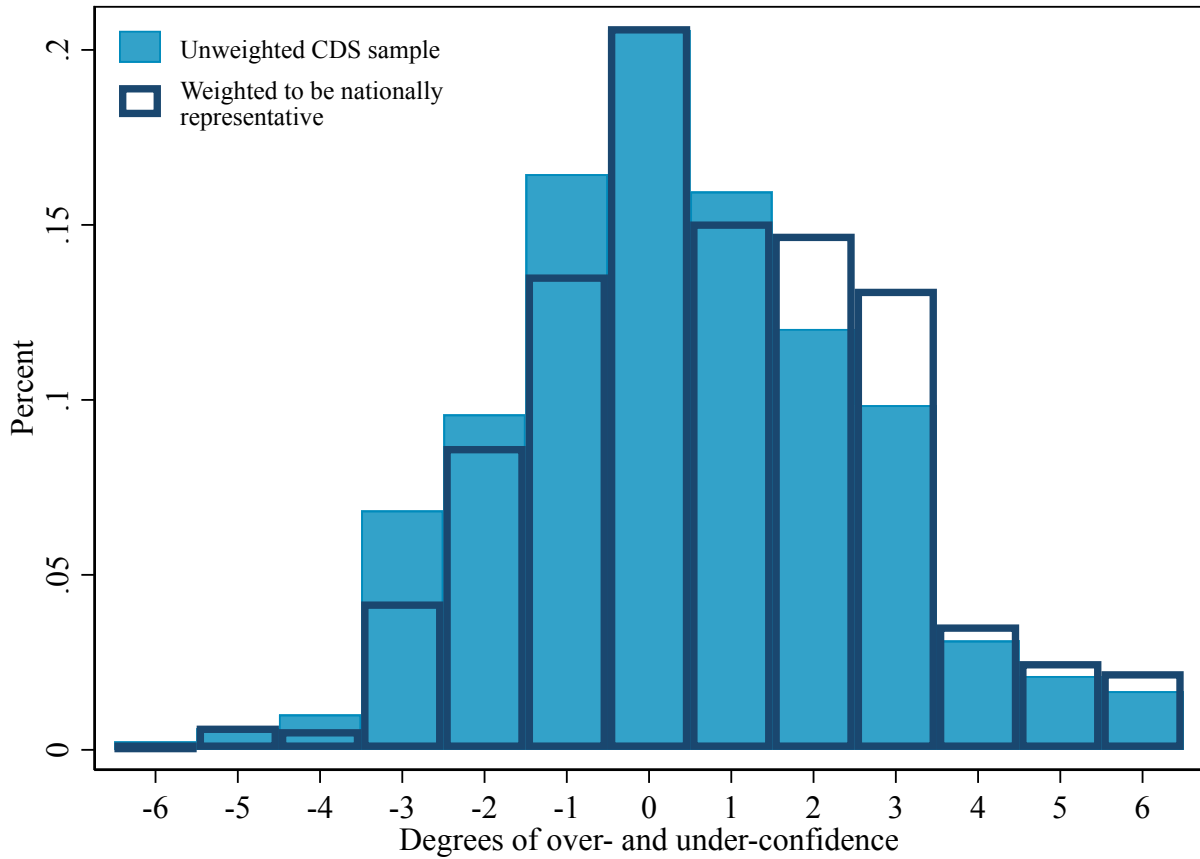

Note: This figure plots the distributions of our more continuous measure of confidence for our sample and when we use weights that make the sample nationally representative. The measure takes on value of integers from -6 (under-confident) to 6 (over-confident) and is calculated as the difference between children's self-assessed ability from 1-7 and the bin in which they should have placed themselves if they knew their score and the (uniform) national distribution of test scores. Weights are calculated using iterative proportional fitting (raking) on the original weights provided by the CDS so that our sample matches population shares in quintiles of income, in race categories, and in deciles of nationally-normed WJ-R math percentile scores.

Figure A2: Patterns in over- and under-confidence by age

Panel A: Proportion over- and under-confident (binary measure)
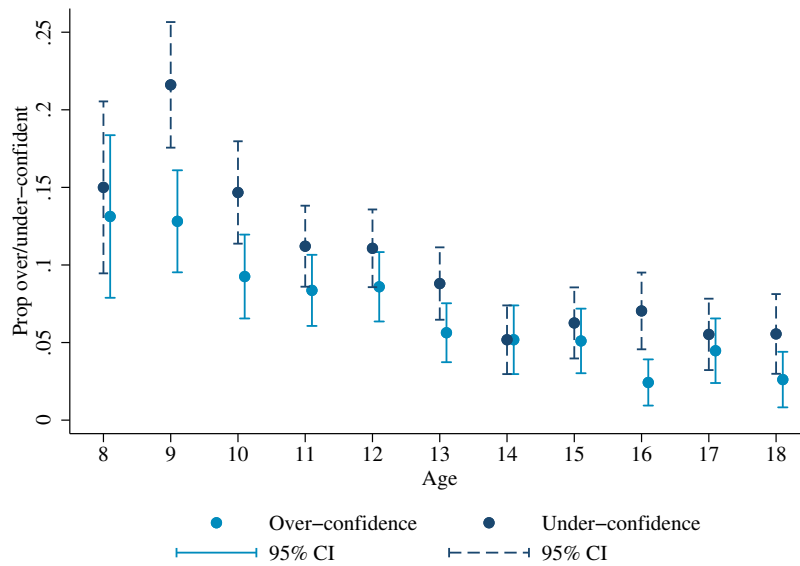
Panel B: CDF of degrees of over- and under-confidence
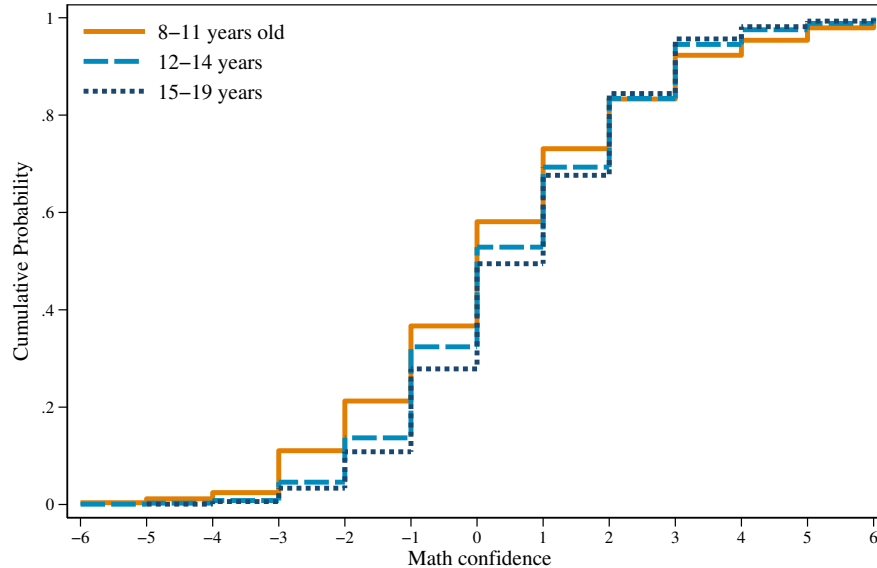
Note: Panel A plots the proportion of respondents that are over- and under-confident by age. Panel B plots the cumulative density function for the degrees of confidence measure, which takes on values from -6 to 6, separately for children in three age groups. We estimate these proportions using all observations of self-reported ability and test scores in math for our 2985 respondents, including two reports for the 60% of our sample with confidence measures in two CDS waves. In Panel A, we identify over- and under-confidence in math using gaps between children's self-reported math ability and their performance on the WJ-R math test administered in the CDS. In particular, we classify a respondent as under-confident if she scored above the 75th percentile on the WJ-R math assessments and ranked herself at 1-4 on the 7-point scale of math ability, or if she scored above the 50th percentile and ranked herself at 1-3. Similarly, we identify any respondent as over-confident in math if she scored below the 25th percentile and rated herself at 6 or 7 on the response scale, or if she scored below the 50th percentile and rated herself at 7. In Panel B, we measure biased beliefs as the difference between children's self-assessed ability (between 1 and 7) and the bin of the ability distribution in which they should have placed themselves if they had full information about the national distribution of scores and their place in it.

Figure A3: Differences in over- or under-confidence classification using 2 subtests of the WJ-R
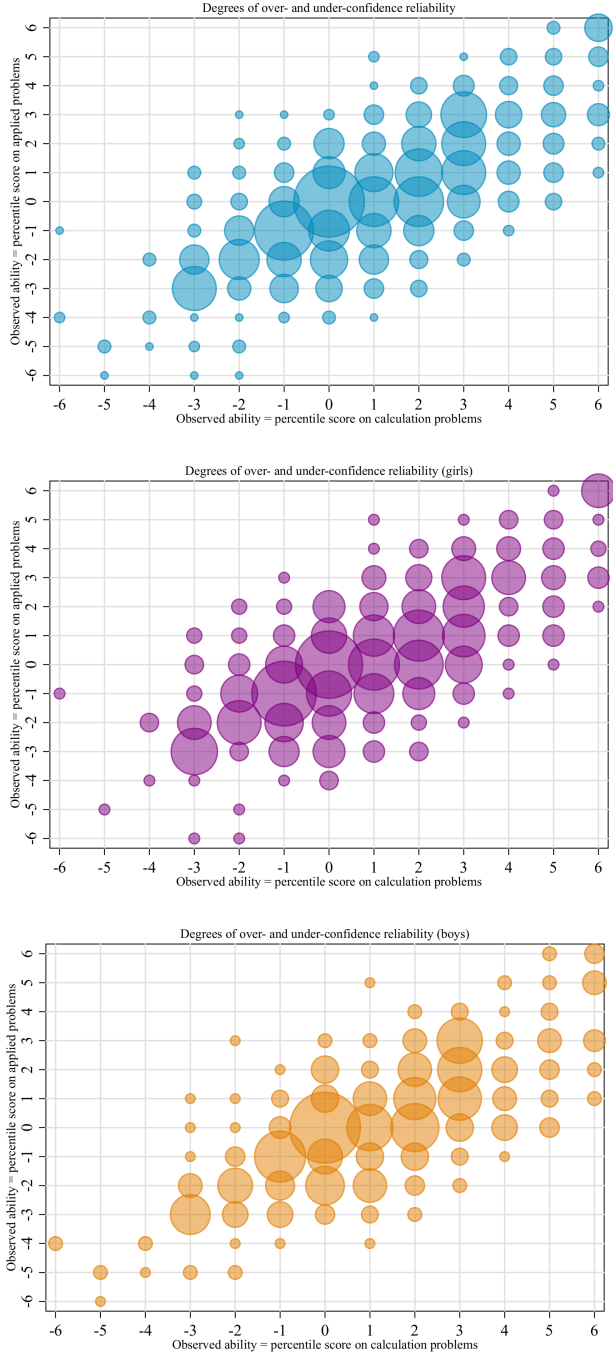
Note: This figure plots the joint distribution of children's degree of over- and under-confidence, which takes on values of integers from -6 (under-confident) to 6 (over-confident), when we use two different measures of demonstrated ability: percentile scores on the applied reasoning section of the WJ-R test (our main measure) and percentile scores on the calculation section of the WJ-R test (only administered in 1997).

Figure A4: Specification chart for persistence into adolescence
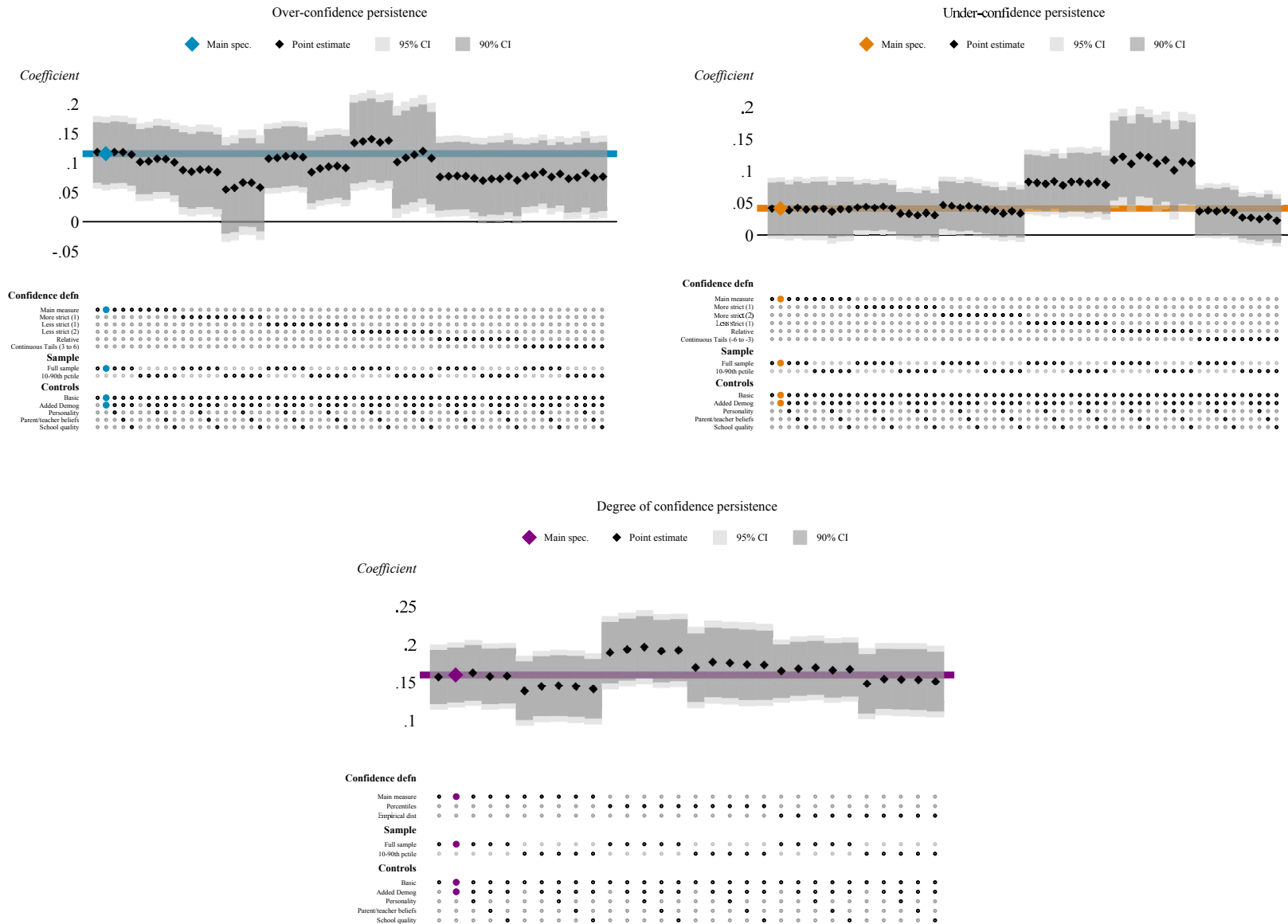
Note: This figure plots the coefficient of interest on either over- or under-confidence or our degrees of confidence measure for a large number of specification tests. The outcome is the same confidence measure as the main independent variable, observed 5 years later. We test the relationship between childhood biased beliefs and adolescent biased beliefs when we (a) change our definitions of over- and under-confidence and the degrees of confidence measure, (b) drop the bottom and top ten percent of the ability distribution, since those children are mechanically the most likely to be over- or under-confident, respectively, and (c) iterate through each of five sets of control variables. Appendix F describes each alternate confidence definition in detail.

Figure A5: Specification chart for adolescent math scores
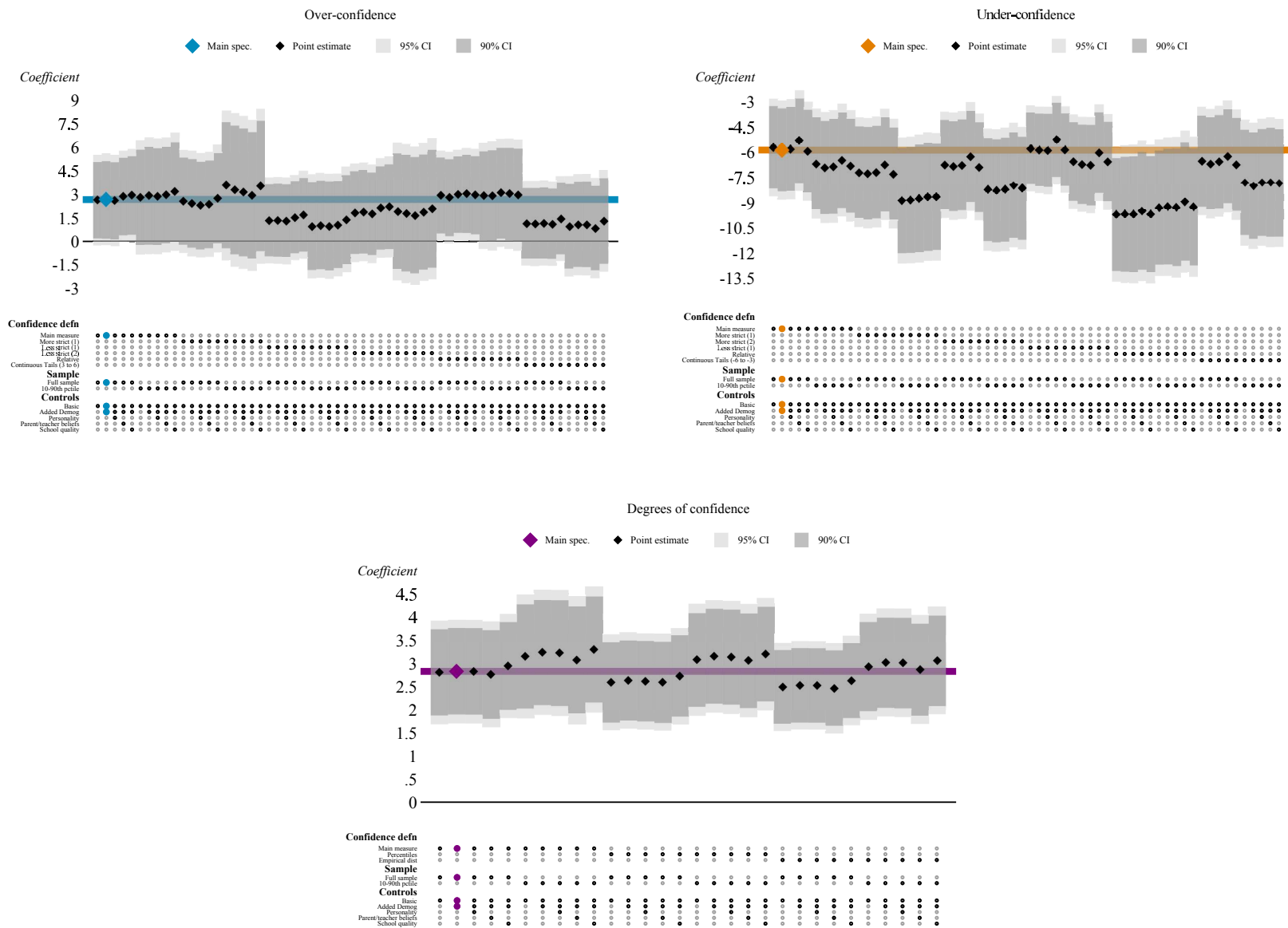
Note: This figure is analogous to Appendix Figure A4, but the outcome is adolescent math test scores.

Figure A6: Specification chart for adolescent reading scores

Note: This figure is analogous to Appendix Figure A4, but the outcome is adolescent reading test scores.

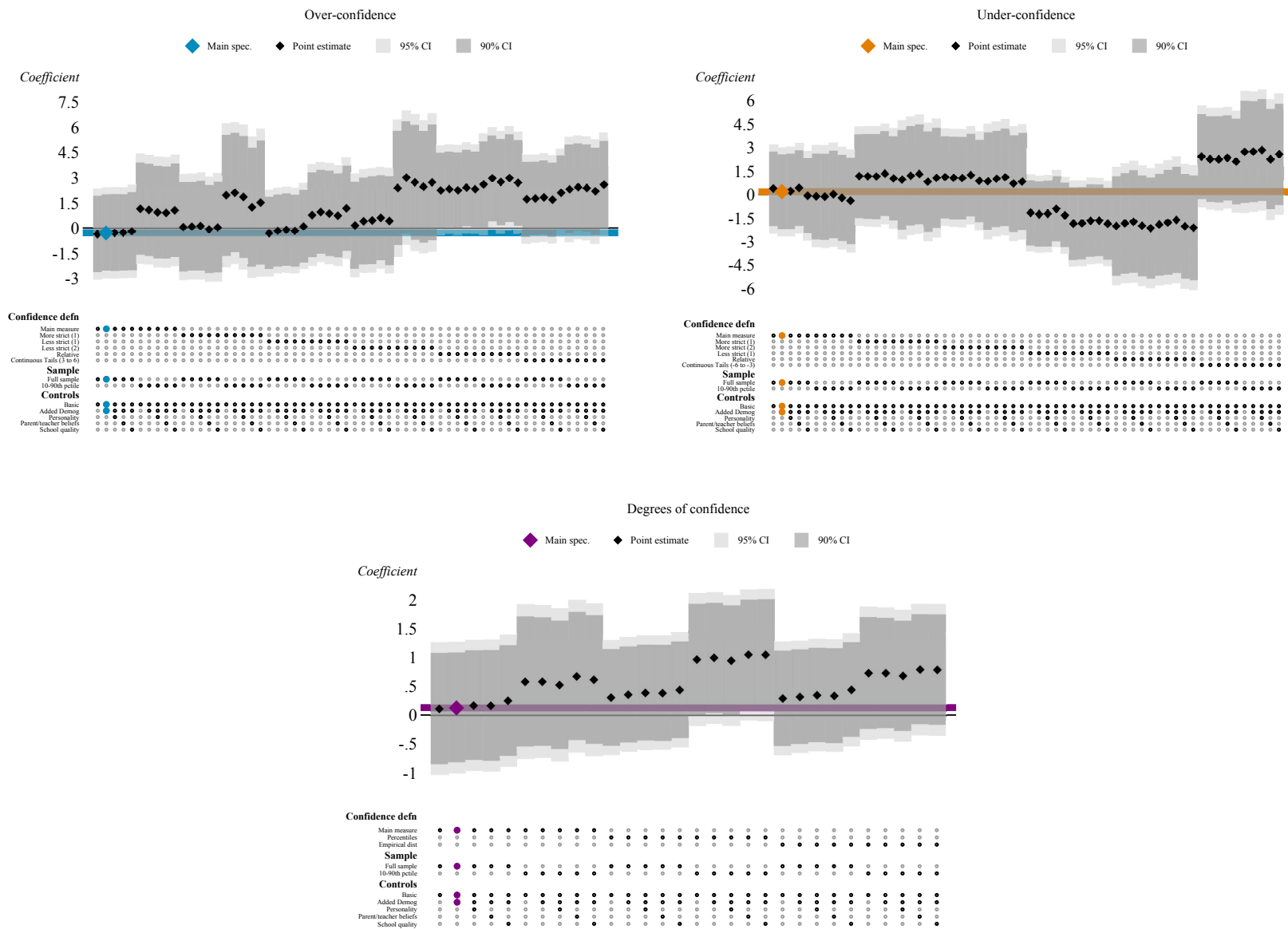# Figure A7: Specification chart for graduating from high school

Note: This figure plots the coefficient of interest on either over- or under-confidence or our degrees of confidence measure for a large number of specification tests. The outcome is an indicator for graduating from high school. We test the relationship between childhood biased beliefs and high-school graduation when we (a) change our definitions of over- and under-confidence and the degrees of confidence measure, (b) drop the bottom and top ten percent of the ability distribution, since those children are the mechanically most likely to be over- or under-confident, respectively, and (c) iterate through each of five sets of control variables. Here, our alternate definitions of biased beliefs include measures of confidence that replicate the main measure but are based on information from multiple waves of the CDS. Appendix F describes each alternate confidence definition in detail.

Figure A8: Specification chart for graduating from college
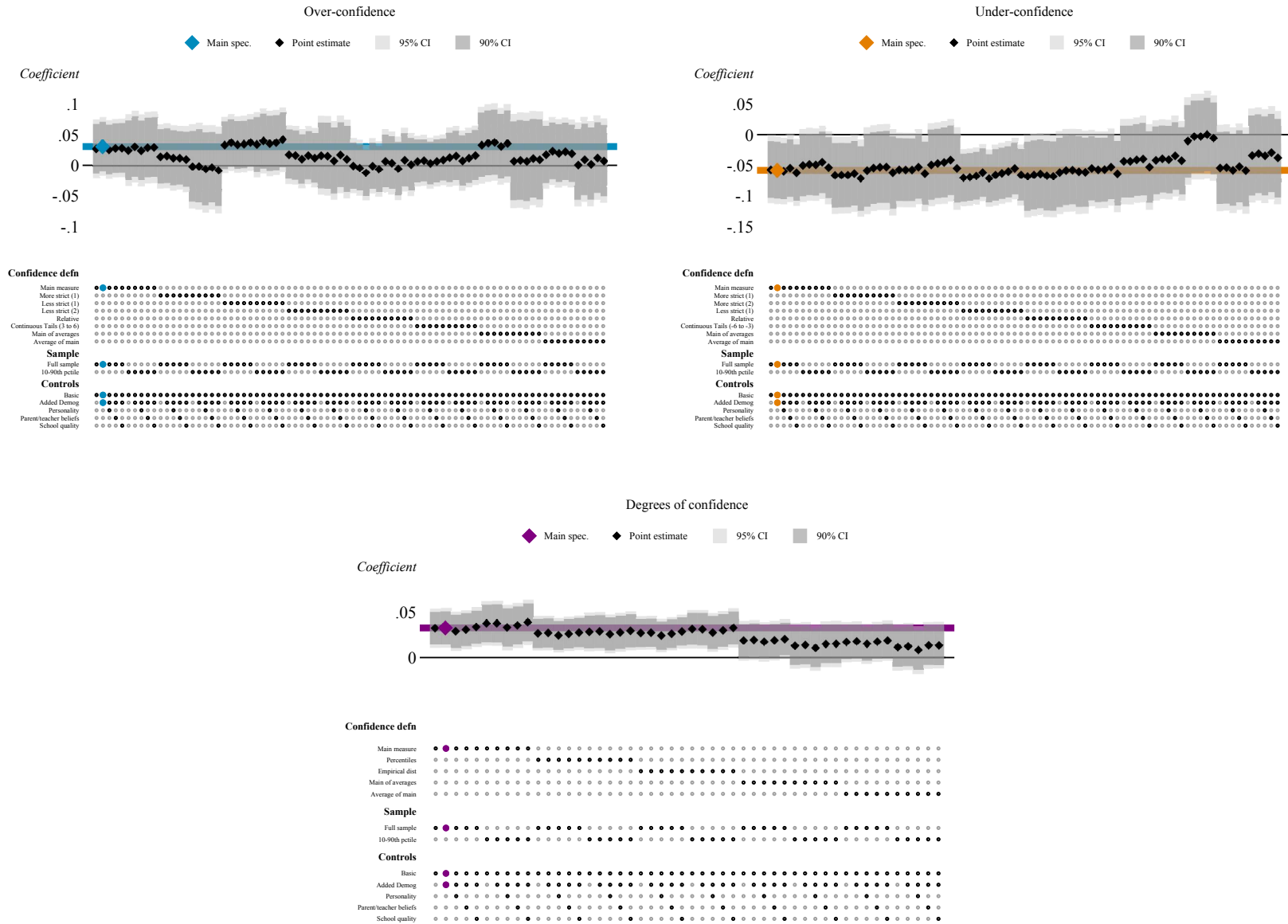
Note: This figure is analogous to Appendix Figure A7, but the outcome is an indicator for graduating from college.

Figure A9: Specification chart for college quality index
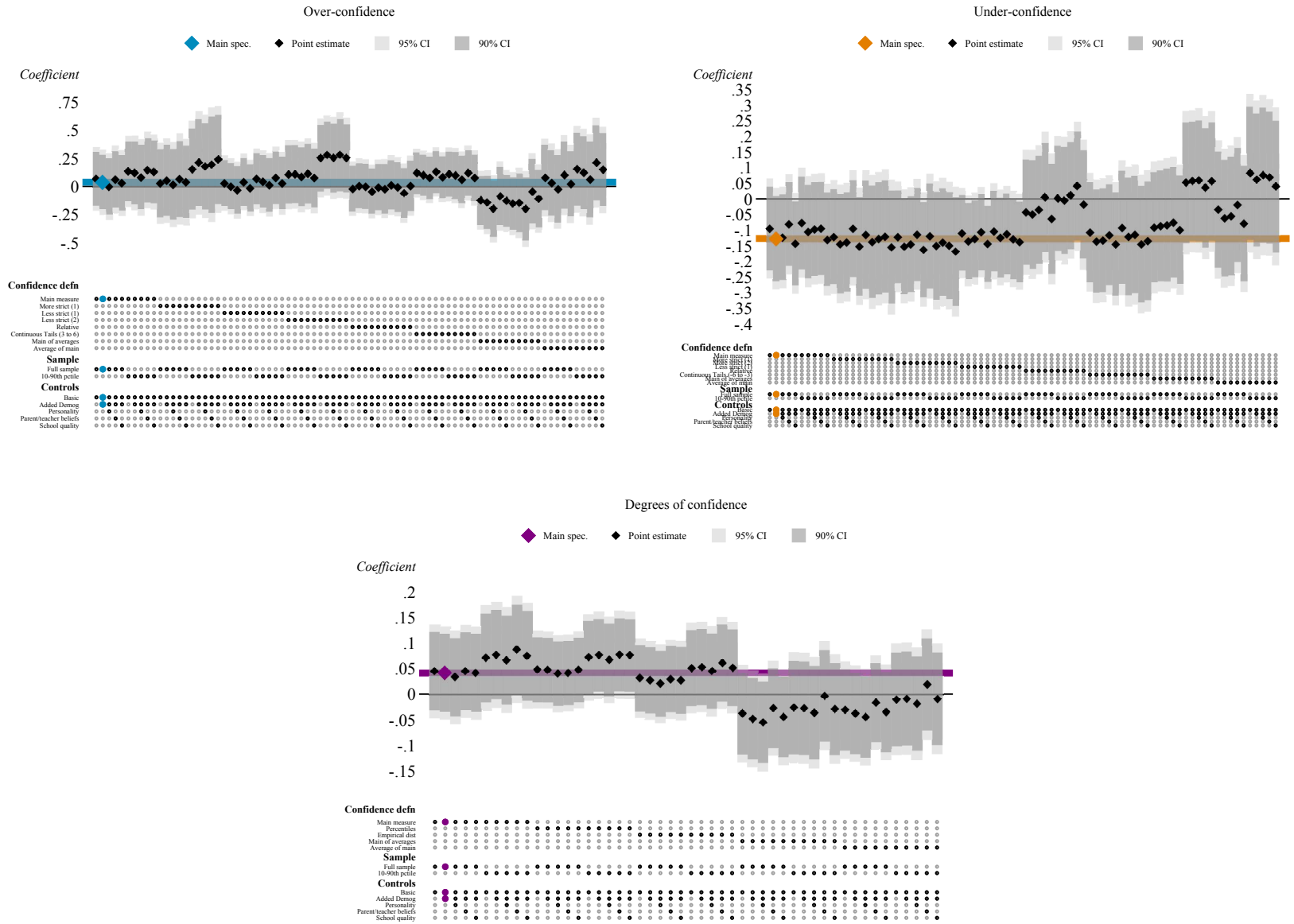
Note: This figure is analogous to Appendix Figure A7, but the outcome is the index of college quality for a student's first college attended (conditional on going to college).

Figure A10: Specification chart for college's 75th percentile math SAT score
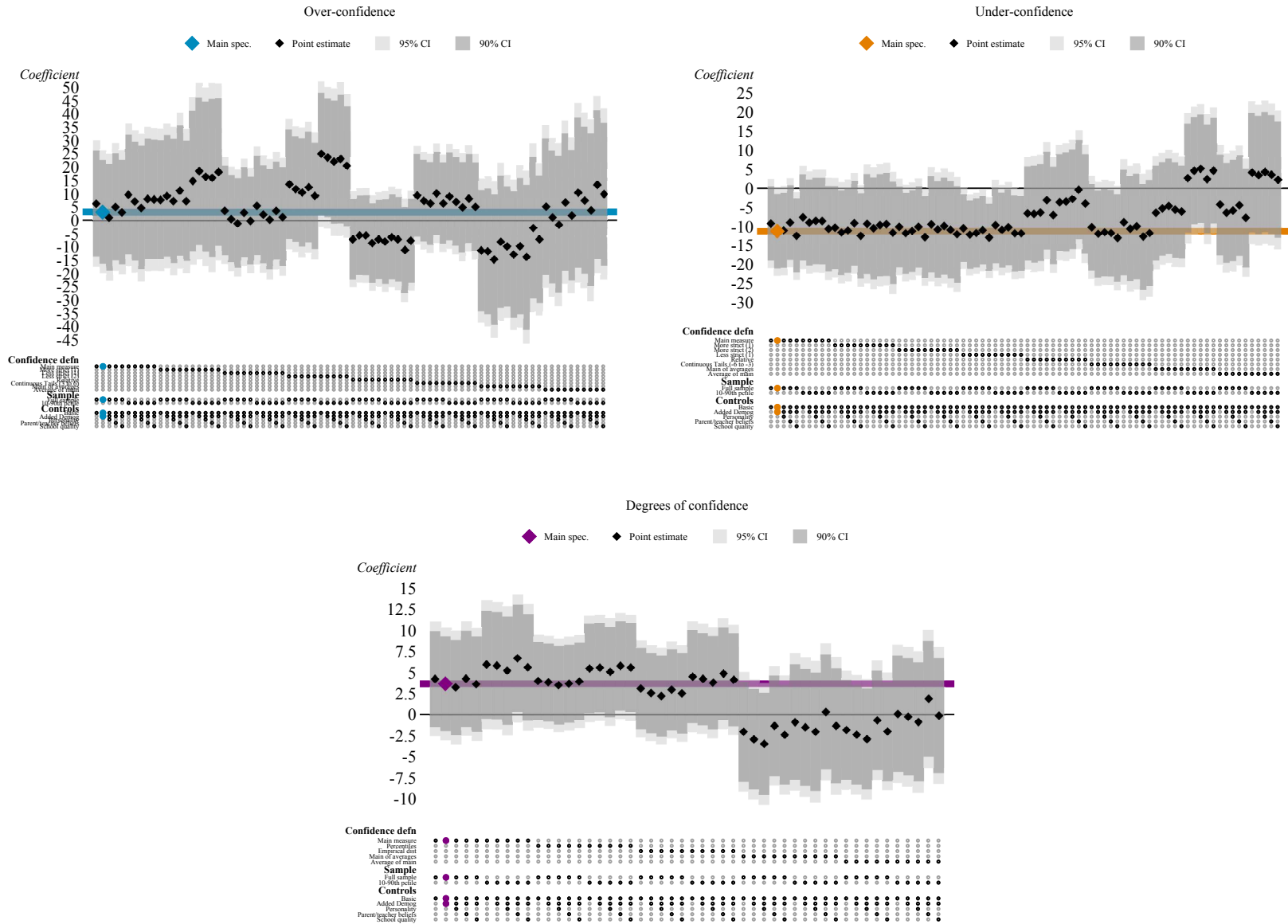
Note: This figure is analogous to Appendix Figure A7, but the outcome is the 75th percentile math SAT score at a student's first college attended (conditional on going to college).

Figure A11: Specification chart for majoring in STEM
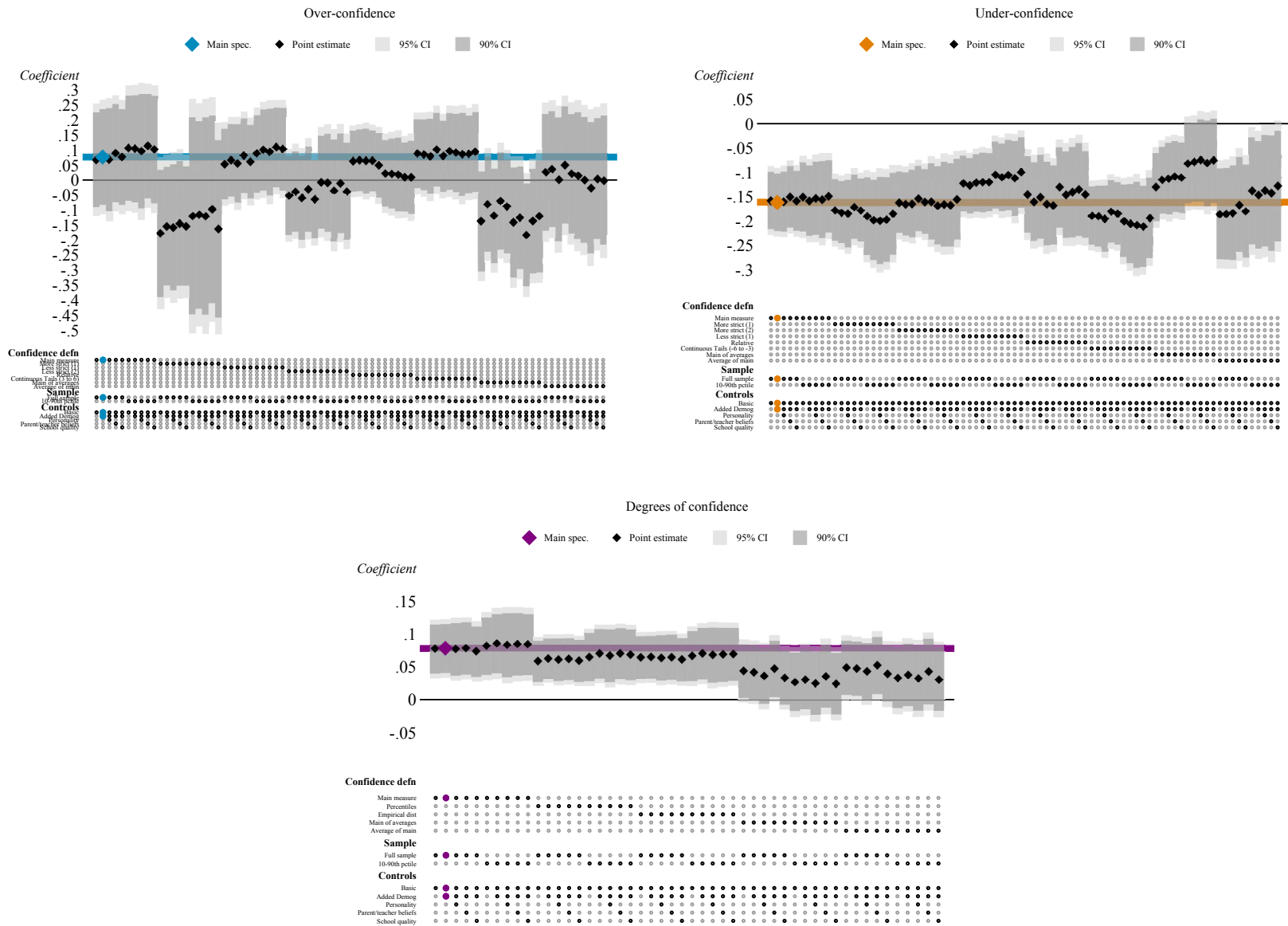
Note: This figure is analogous to Appendix Figure A7, but the outcome is an indicator for majoring in STEM (conditional on going to college).

Figure A12: Specification chart for having a graduate school degree
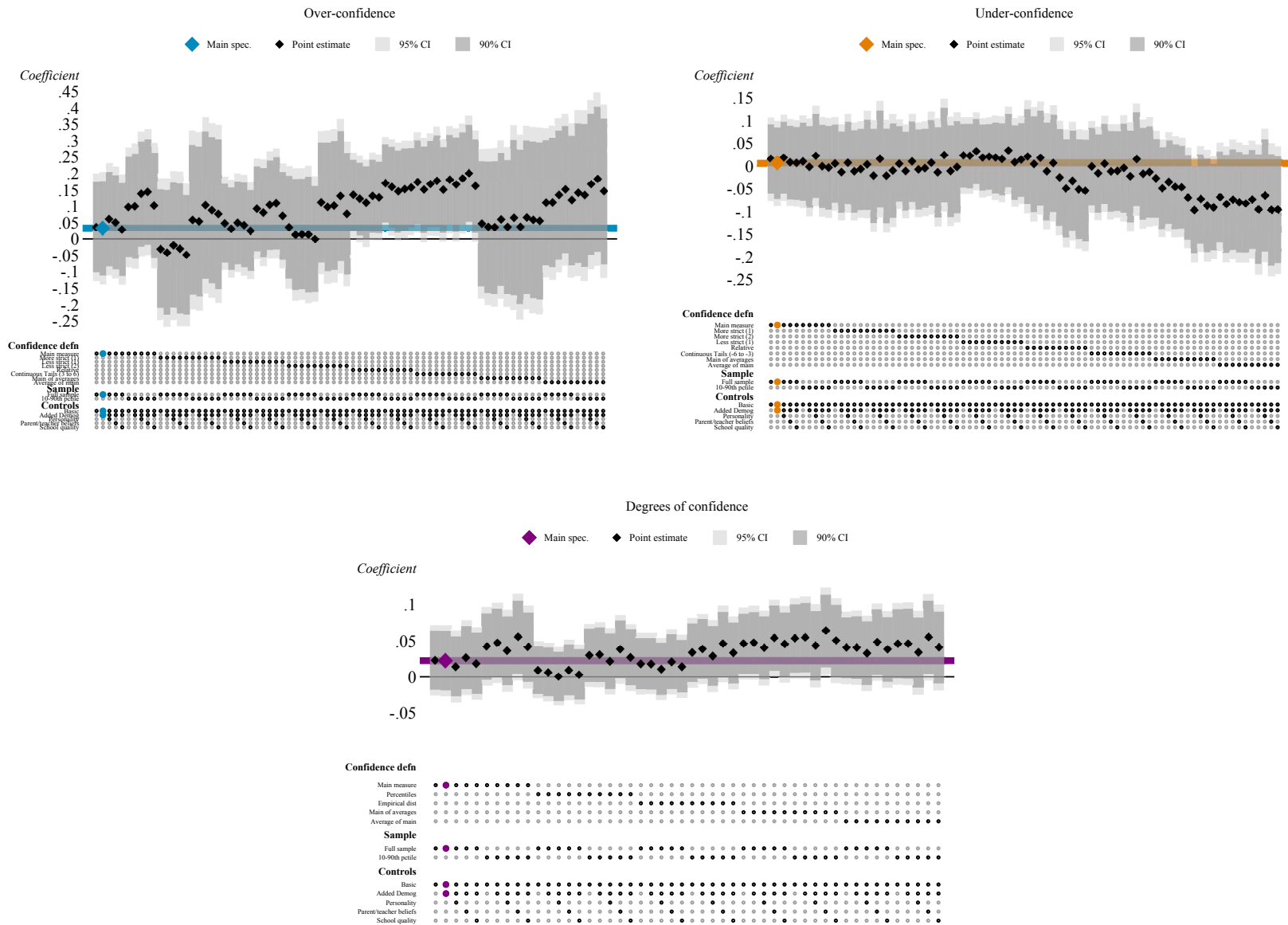
Note: This figure is analogous to Appendix Figure A7, but the outcome is an indicator for having a graduate degree (conditional on going to college).

Figure A13: Specification chart for working in STEM
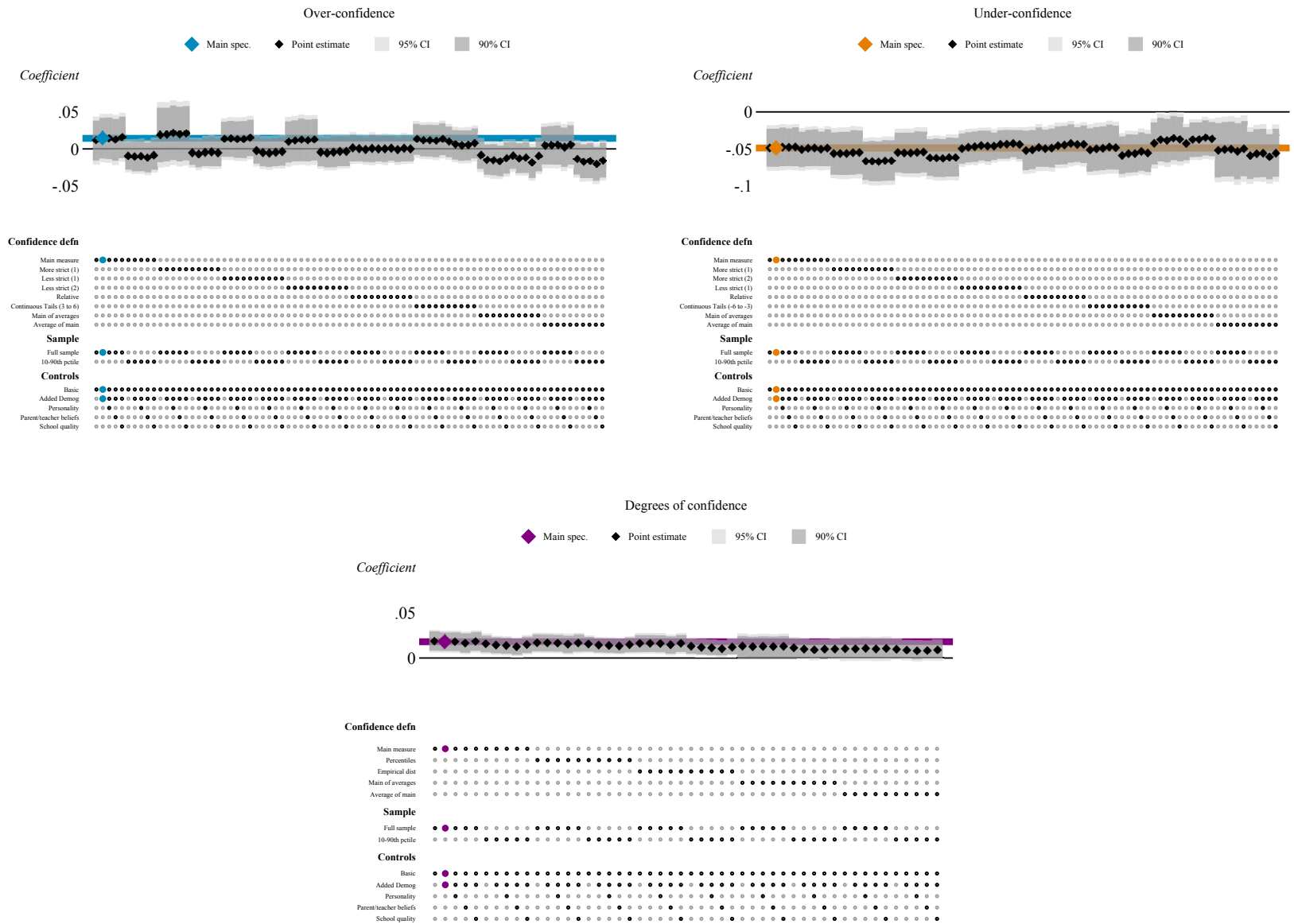
Note: This figure is analogous to Appendix Figure A7, but the outcome is an indicator for working in STEM.

Figure A14: Specification chart for working in non-STEM high-education occupation
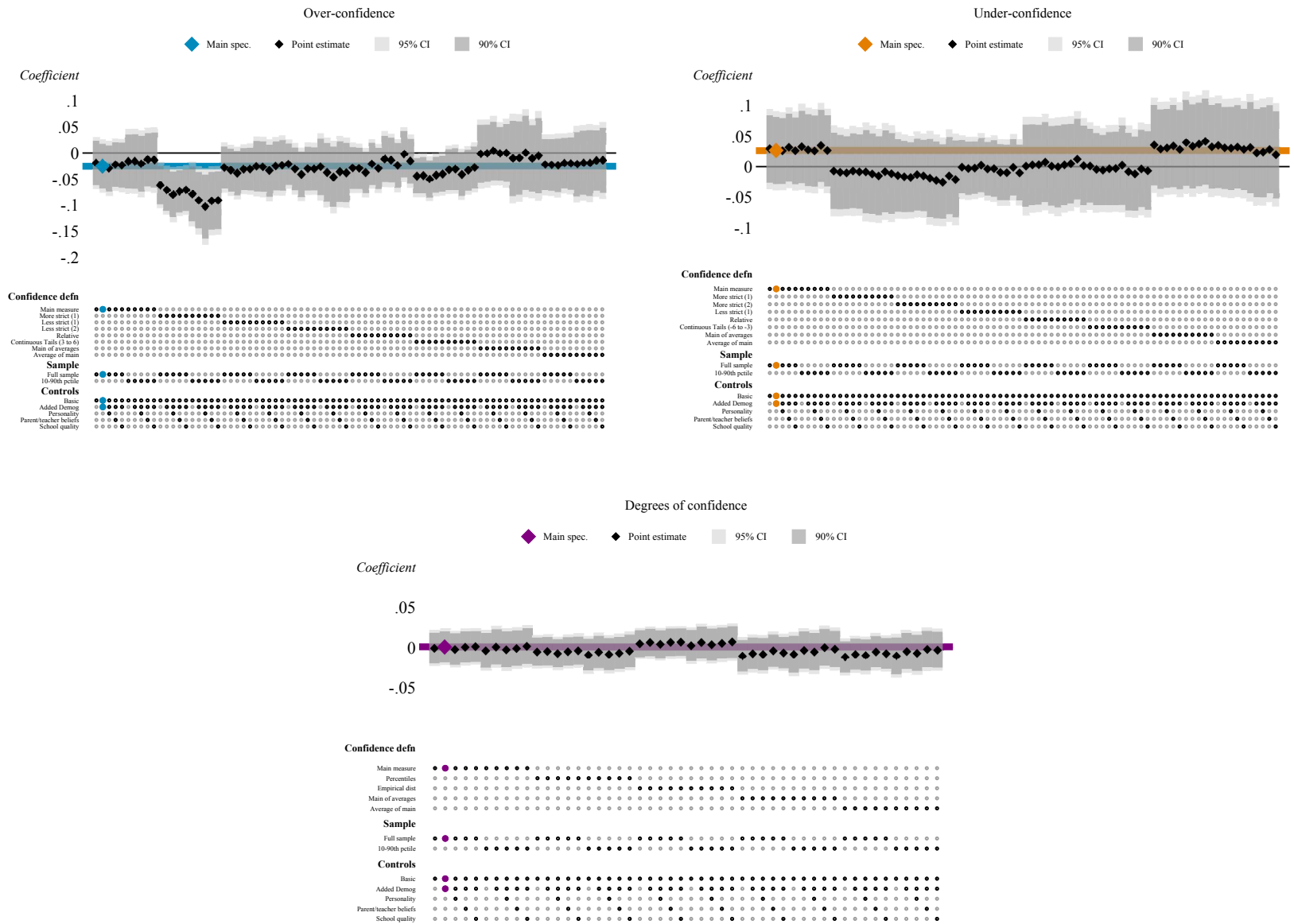
Note: This figure is analogous to Appendix Figure A7, but the outcome is an indicator for working in a non-STEM high-education job.

Figure A15: Specification chart for ln(earnings)
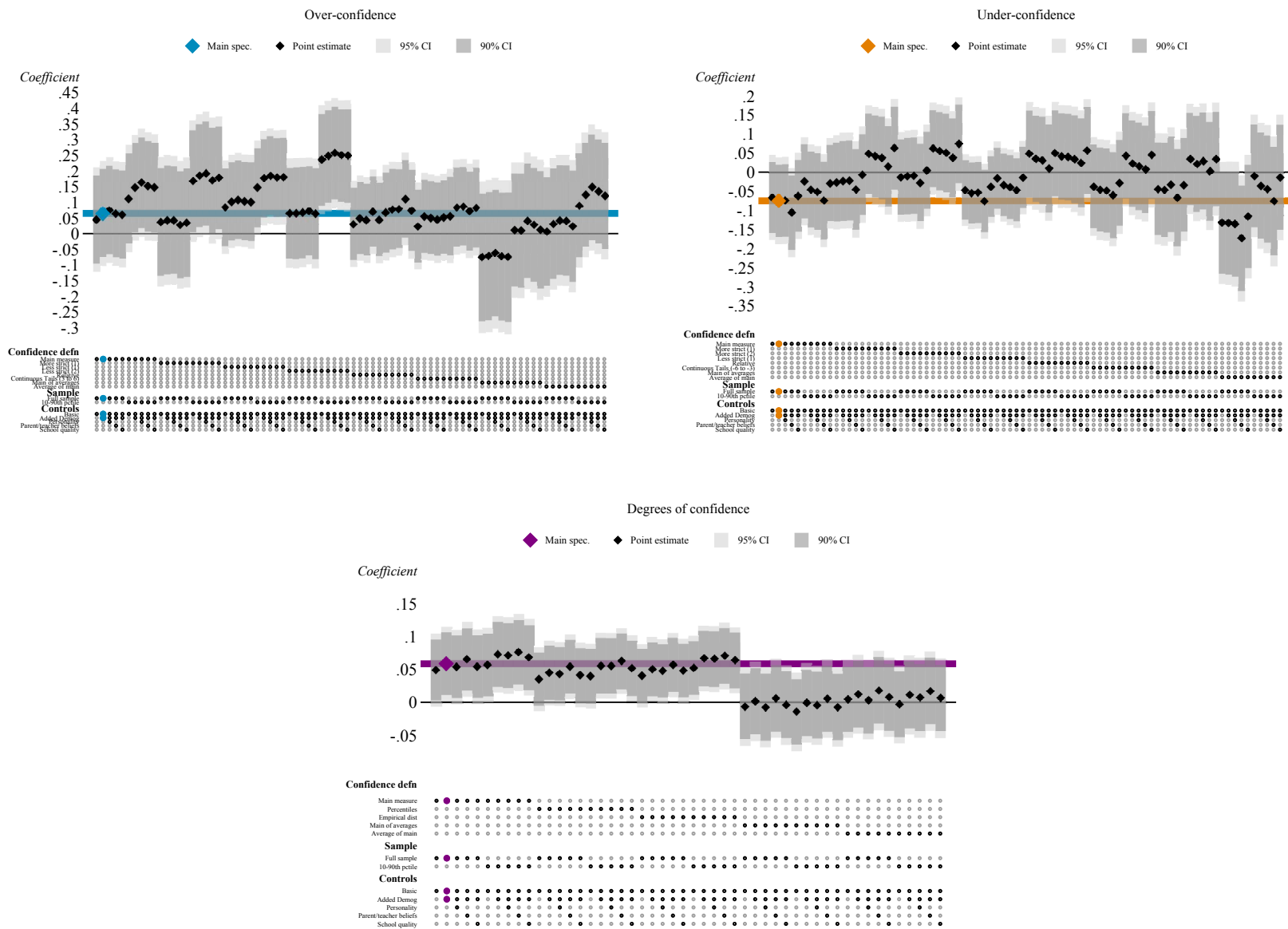
Note: This figure is analogous to Appendix Figure A7, but the outcome is log earnings.

Figure A16: Specification chart for unemployment

Over-confidence

| Main spec. | Point estimate | 95% CI | 90% CI |

Coefficient

Under-confidence

| Main spec. | Point estimate | 95% CI | 90% CI |

Coefficient

Confidence defn
Main measure
More strict (1)
Less strict (1)
Less strict (2)
Relative
Continuous Tails (3 to 6)
Main of averages
Average of main

Sample
Full sample
10-90th pctile

Controls
Basic
Added Demog
Personality
Parent/teacher beliefs
School quality

Degrees of confidence

| Main spec. | Point estimate | 95% CI | 90% CI |

Coefficient

Confidence defn
Main measure
Percentiles
Empirical dist
Main of averages
Average of main

Sample
Full sample
10-90th pctile

Controls
Basic
Added Demog
Personality
Parent/teacher beliefs
School quality

Note: This figure is analogous to Appendix Figure A7, but the outcome is an indicator for being ever unemployed in that year.

Figure A17: Specification chart for gender differences
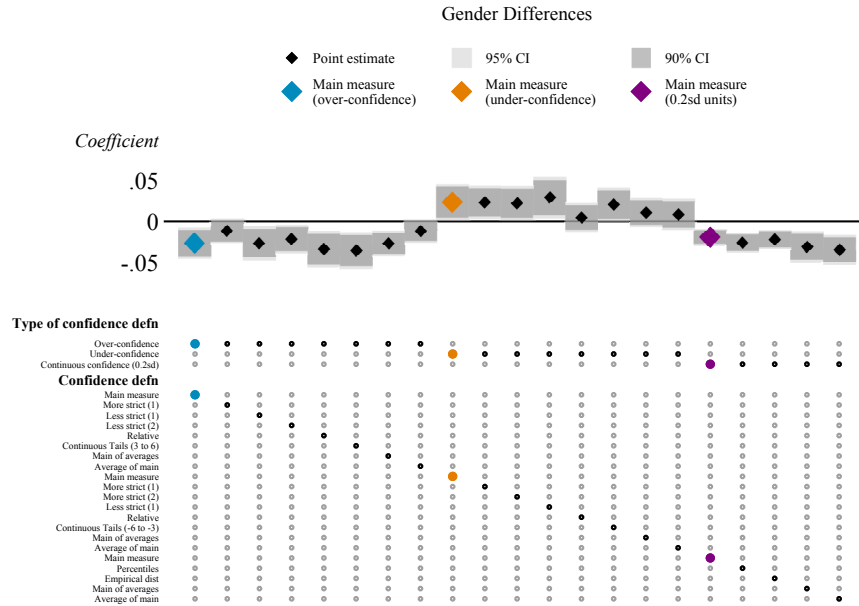
Note: This figure presents the gender gap in confidence for every measure of confidence we consider. For all measures, there is a robust gender gap: girls are less likely to be over-confident, more likely to be under-confident, and have lower degrees of confidence. Each point plots the coefficient on the female indicator when we replace the dependent variables in Table 2 with each of our alternate measures. Note that the more continuous measures of degrees of over- and under-confidence are all divided by 5 so that the resulting coefficient is on a similar scale as the coefficients when the outcome is an indicator for over- and under-confidence. This chart aims to communicate the stability of these coefficients, but one can obtain the gender gap in standard deviations by multiplying the coefficient for the more continuous measures by 5.

Figure A18: Coefficients on each confidence level fixed effect (medium-term educational achievement and attainment)
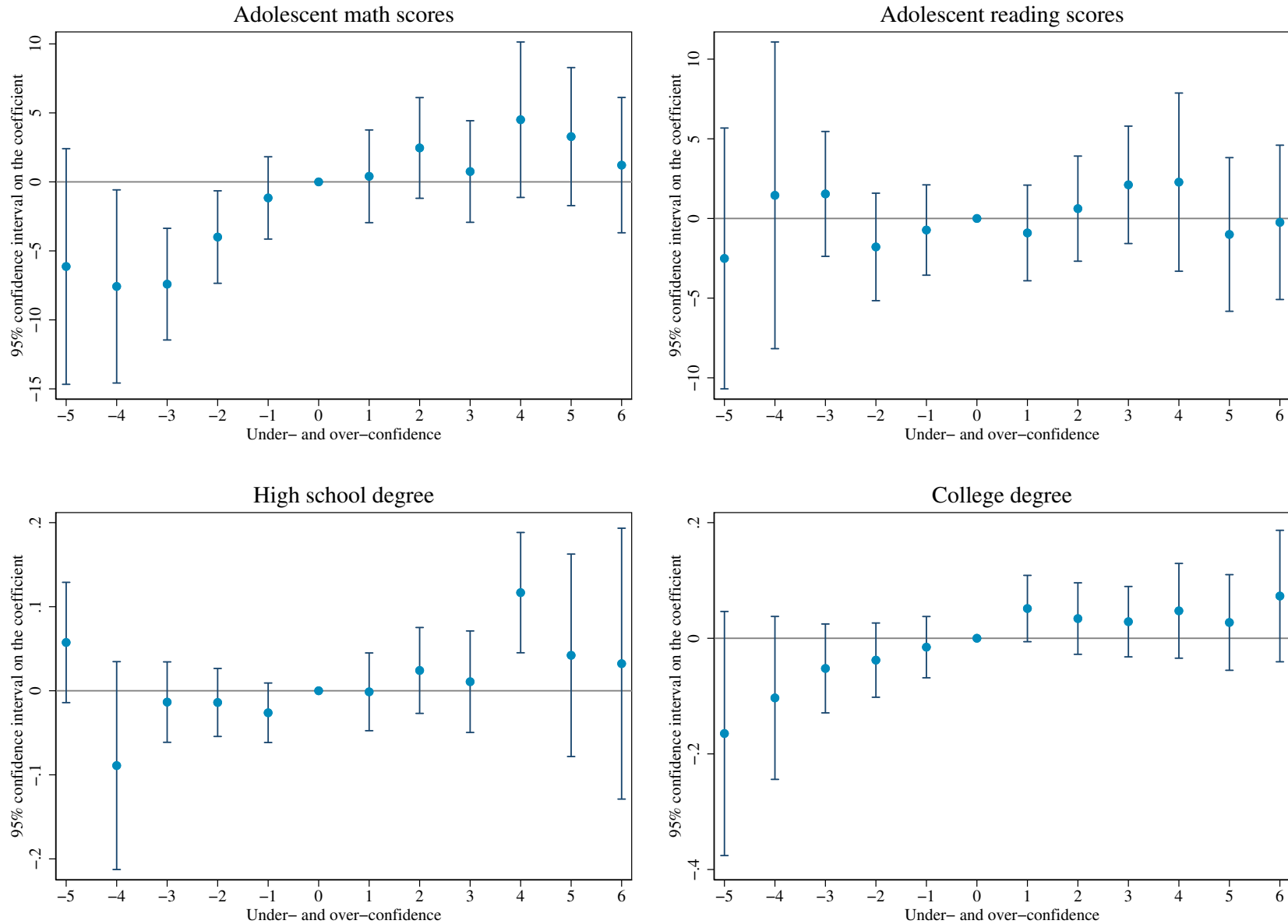
Notes: This figure plots results from a version of our main specification where we include fixed effects on each integer value of the degrees of confidence measure, which takes on integer values from -6 to 6. It is measured as the difference between a child's self-assessed ability (from 1-7) and the bin from 1-7 in which they should have placed themselves if they knew the national score distribution and their place in it. The outcomes are the same as in Table 3, where the degrees of confidence measure enters linearly into the specification. These figures support that linearity assumption.

Figure A19: Coefficients on each confidence level fixed effect (college quality, college major, and post-college schooling)
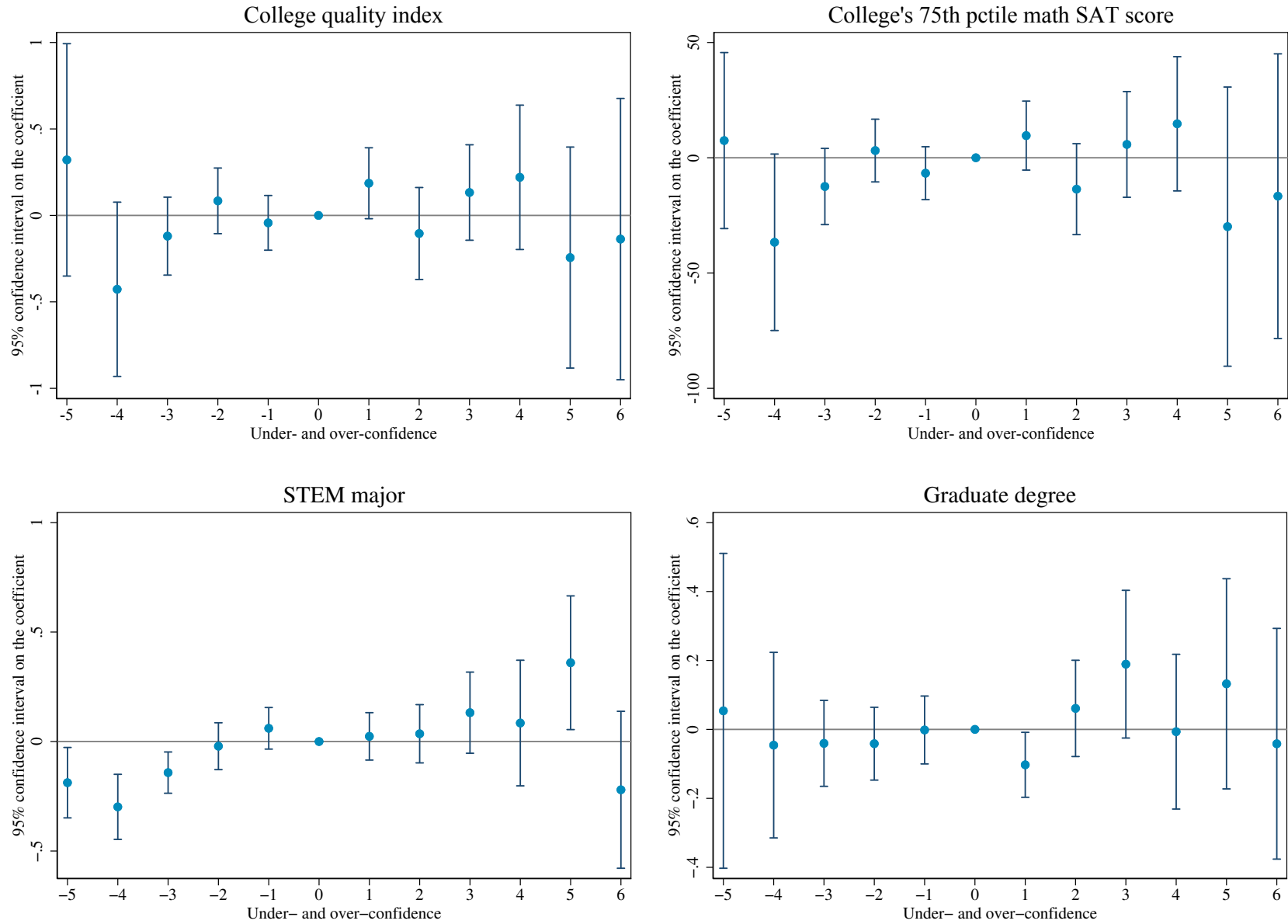
Notes: This figure parallels figure A18, but for the outcomes presented in Table 4.

Figure A20: Coefficients on each confidence level fixed effect (employment outcomes)
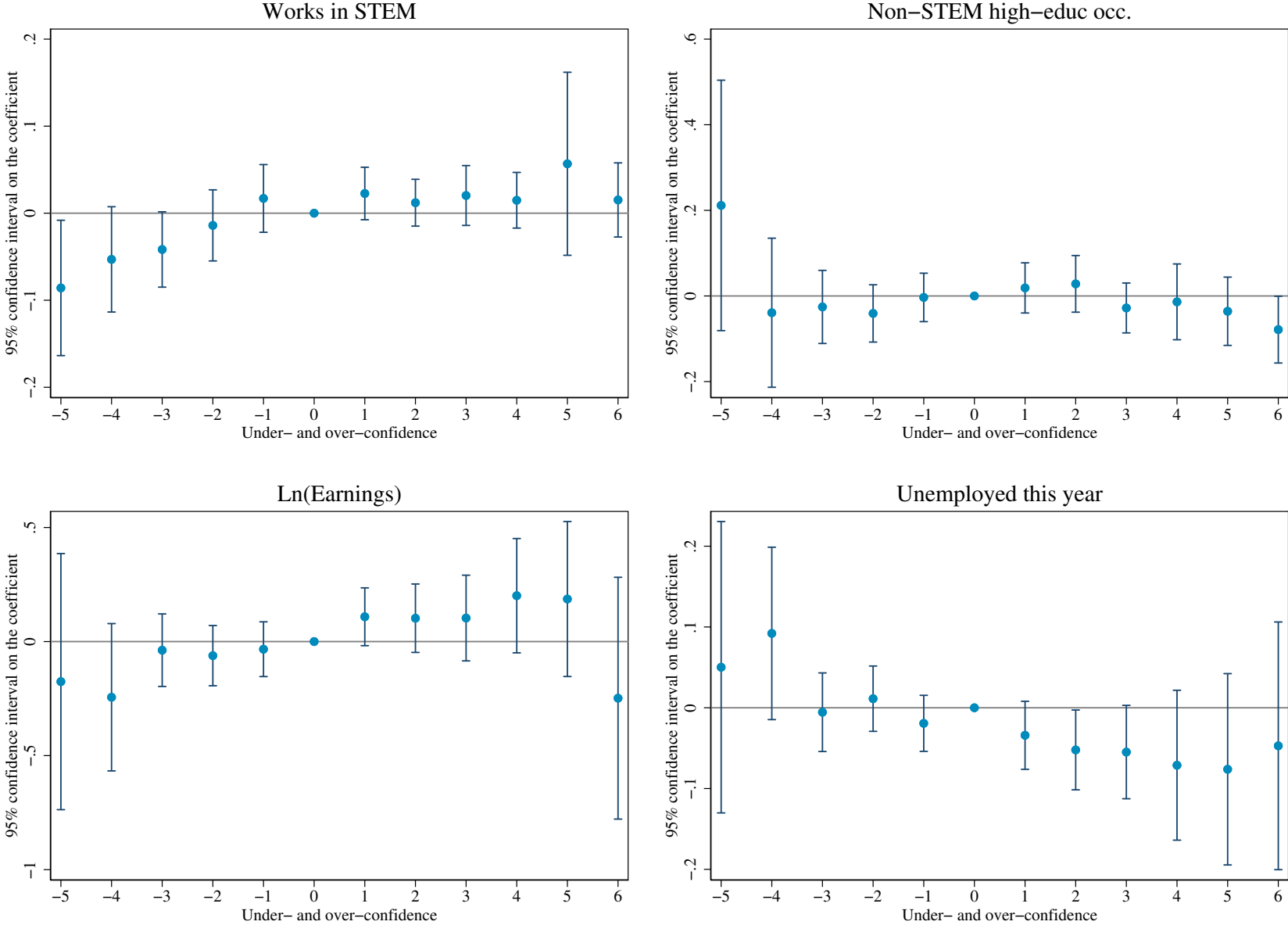
Notes: This figure parallels figure A18, but for the outcomes presented in Table 5.

Table A1: WJ-R Applied Problems section scores predict long-run outcomes

	Math Score (1)	Reading Score (2)	HS grad (3)	College grad (4)	STEM major (5)	STEM occup (6)	High-educ occup (7)	ln(Earnings) (8)	Unempl (9)
Math score percentile/10	4.953***	1.316***	0.008***	0.026***	0.023***	0.006***	0.008**	0.058***	-0.011***
	(0.231)	(0.241)	(0.003)	(0.004)	(0.008)	(0.002)	(0.004)	(0.010)	(0.003)
Reading score percentile/10	1.503***	6.371***	0.015***	0.021***	0.007	-0.001	0.014***	0.014	-0.002
	(0.242)	(0.242)	(0.003)	(0.004)	(0.008)	(0.002)	(0.004)	(0.010)	(0.003)
N	1747	1745	2714	2725	736	4592	4592	4423	4975
Sample mean	50.808	48.231	0.876	0.297	0.189	0.046	0.163	10.185	0.167
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: This table regresses educational and employment outcomes on CDS math and reading scores. We drop our fixed effect controls for math and reading score deciles, replacing them with linear controls for math and reading score percentiles. These regressions include all controls included in Table 1 except for childhood over- and under-confidence in math. Basic controls also include year fixed effects when the outcome is observed in a panel. All controls that are indices are normalized relative to the weighted distribution. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A2: The persistence of reading over- and under-confidence

	(1)	(2)
Panel A: Reading over-confidence	0.194***	0.198***
	(0.037)	(0.037)
N	1732	
Sample mean	0.153	
Panel B: Reading under-confidence	0.098***	0.102***
	(0.034)	(0.034)
N	1732	
Sample mean	0.061	
Panel C: Reading confidence (SD units)	0.165***	0.166***
	(0.024)	(0.024)
N	1732	
Sample mean	-0.002	
Basic controls:	✓	✓
Added background controls:		✓

Notes: This table regresses adolescent confidence outcomes on childhood reading confidence with various controls. All controls are the same as described in Table 1. Standard errors are clustered by family, and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A3: Childhood reading confidence and medium-term educational achievement and attainment

Dependent variable:	Adolescent math scores		Adolescent reading scores		High school degree		College degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Panel A: Independent variables are binary measures of over- and under-confidence

Over-confidence	-3.630***	-3.745***	1.668	1.564	-0.033	-0.032	0.008	0.008
	(1.265)	(1.291)	(1.320)	(1.314)	(0.025)	(0.025)	(0.020)	(0.020)
Under-confidence	2.075	2.002	-5.720***	-5.811***	-0.004	-0.008	-0.040	-0.043
	(1.835)	(1.830)	(1.707)	(1.749)	(0.024)	(0.023)	(0.040)	(0.040)
N	1734	1734	1732	1732	2698	2698	2709	2709
OC = -1*UC? *p-value*:	0.487	0.436	0.057	0.050	0.288	0.244	0.467	0.423

Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units

Confidence	-1.773***	-1.750***	1.989***	2.008***	-0.014	-0.013	-0.006	-0.004
	(0.609)	(0.623)	(0.565)	(0.577)	(0.010)	(0.010)	(0.010)	(0.010)
N	1734	1734	1732	1732	2698	2698	2709	2709
Sample mean of dep. var.	50.949		48.421		0.875		0.297	
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:		✓		✓		✓		✓

Notes: This table regresses educational achievement and attainment outcomes on childhood biased beliefs with various controls. Biased beliefs are measured in the earlies observed wave in the CDS with non-missing test scores and self-assessed ability. In Panel A, the outcome is regressed on an indicator for over-confidence, an indicator for under-confidence and our basic set of controls (in odd-numbered columns) and our extended set of controls (in even-numbered columns). The p-value listed tests whether the coefficient on the over-confidence indicator is equal to -1 times the coefficient on the under-confidence indicator. In Panel B, the outcome is regressed on our more continous measure of biased beliefs which has been standardized to have mean zero and standard deviation one in our sample and the same sets of controls. All controls are the same as described in Table 1, minus the controls for adolescent test score deciles. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A4: Childhood reading confidence and college quality, college major choice, and post-college schooling

Dependent variable:	College quality index		College's 75th pctile math SAT score		STEM Major		Graduate degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Panel A: Independent variables are binary measures of over- and under-confidence

Over-confidence	-0.011	-0.005	-6.274	-5.052	0.057	0.065	0.009	0.016
	(0.112)	(0.110)	(9.595)	(9.452)	(0.070)	(0.070)	(0.076)	(0.074)
Under-confidence	-0.221*	-0.193*	-13.598*	-10.917	0.103*	0.079	0.060	0.054
	(0.117)	(0.114)	(8.098)	(7.932)	(0.062)	(0.064)	(0.062)	(0.062)
N	1103	1103	1112	1112	732	732	804	804
OC = -1*UC? *p-value*:	0.154	0.212	0.117	0.198	0.081	0.126	0.467	0.461

Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units

Confidence	0.103**	0.090**	7.223**	6.193*	-0.045*	-0.041	-0.010	-0.012
	(0.042)	(0.042)	(3.259)	(3.238)	(0.025)	(0.027)	(0.026)	(0.026)
N	1103	1103	1112	1112	732	732	804	804
Sample mean of dep. var.	0.051		594.052		0.189		0.199	
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:		✓		✓		✓		✓

Notes: This table regresses college outcomes outcomes on childhood biased beliefs with various controls. Biased beliefs are measured in the earlies observed wave in the CDS with non-missing test scores and self-assessed ability. In Panel A, the outcome is regressed on an indicator for over-confidence, an indicator for under-confidence and our basic set of controls (in odd-numbered columns) and our extended set of controls (in even-numbered columns). In Panel B, the outcome is regressed on our more continous measure of biased beliefs which has been standardized to have mean zero and standard deviation one in our sample and the same sets of controls. All controls are the same as described in Table 1, minus the controls for adolescent test score deciles. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A5: Childhood reading confidence and employment outcomes

Dependent variable:	Works in STEM		Non-STEM high-educ occ.		Ln(Earnings)		Unemployed this year	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Panel A: Independent variables are binary measures of over- and under-confidence

Over-confidence	0.003	0.005	0.012	0.005	-0.048	-0.063	-0.007	-0.003
	(0.012)	(0.012)	(0.022)	(0.022)	(0.071)	(0.071)	(0.022)	(0.022)
Under-confidence	0.056*	0.055*	-0.006	-0.012	0.073	0.054	-0.037	-0.034
	(0.033)	(0.033)	(0.045)	(0.045)	(0.071)	(0.070)	(0.023)	(0.022)
N	4564	4564	4564	4564	4395	4395	4943	4943
OC = -1*UC? *p-value*:	0.092	0.079	0.897	0.878	0.801	0.925	0.164	0.235

Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units

Confidence	-0.005	-0.005	0.003	0.001	-0.054*	-0.051*	0.006	0.006
	(0.007)	(0.007)	(0.012)	(0.012)	(0.029)	(0.029)	(0.009)	(0.009)
N	4564	4564	4564	4564	4395	4395	4943	4943
Sample mean of dep. var.	0.045		0.163		10.185		0.168	
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:		✓		✓		✓		✓

Notes: This table regresses employment outcomes on childhood biased beliefs with various controls. Biased beliefs are measured in the earlies observed wave in the CDS with non-missing test scores and self-assessed ability. In Panel A, the outcome is regressed on an indicator for over-confidence, an indicator for under-confidence and our basic set of controls (in odd-numbered columns) and our extended set of controls (in even-numbered columns). The p-value listed tests whether the coefficient on the over-confidence indicator is equal to -1 times the coefficient on the under-confidence indicator. In Panel B, the outcome is regressed on our more continous measure of biased beliefs which has been standardized to have mean zero and standard deviation one in our sample and the same sets of controls. All controls are the same as described in Table 1, minus the controls for adolescent test score deciles. Basic controls also include year fixed effects when the outcome is observed in a panel. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A6: Summary statistics

	Mean	SD	Med.	Share Mi.
Panel A: Child Demographics				
Child is female	0.497	0.500	0	0.000
Child is white	0.458	0.498	0	0.000
Child is black	0.417	0.493	0	0.000
Child is hispanic	0.075	0.264	0	0.000
Child's birth year	1990.020	3.748	1990	0.000
Panel B: Parent and Family Demographics				
Father at least graduated high school	0.835	0.371	1	0.370
Father at least has bachelors	0.257	0.437	0	0.369
Mother at least graduated high school	0.817	0.387	1	0.110
Mother at least has bachelors	0.134	0.341	0	0.113
Mother works in STEM	0.018	0.133	0	0.157
Father works in STEM	0.072	0.259	0	0.321
Mother works in other high-educ field	0.169	0.375	0	0.157
Father works in other high-educ field	0.109	0.311	0	0.321
Total family taxable income (thous 2016 USD)	69.777	80.333	52.03	0.000
HH receives govt transfers	0.478	0.500	0	0.000
# Siblings in the HH	1.415	1.081	1	0.000
Panel C: Parenting Practices and Beliefs				
Father figure in HH	0.727	0.445	1	0.008
Two adults in HH	0.645	0.479	1	0.000
Parent says key thing for success is:				
to obey	0.278	0.448	0	0.023
to think for one's self	0.711	0.453	1	0.023
to work hard	0.284	0.451	0	0.023
to help others in need	0.174	0.380	0	0.023
At least once/week, parent:				
reads with child	0.386	0.487	0	0.004
does art with child	0.072	0.258	0	0.004
plays sports with child	0.157	0.364	0	0.005
does homework with child	0.634	0.482	1	0.005
plays board games with child	0.145	0.352	0	0.004
shows phys. affection to child	0.912	0.283	1	0.642
says *I love you* to child	0.894	0.308	1	0.005
Parent's traditional gender norms (index)	0.019	0.561	0	0.147
Parent's poor mental health (index)	-0.001	0.674	-0	0.116
Parent's self esteem (index)	0.011	0.992	0	0.146
Parent's self efficacy (index)	0.012	0.994	-0	0.144
Aggravation in parenting (index)	0.006	1.008	-0	0.143
Parent expectations for educ. attainment:				
Graduate degree	0.125	0.331	0	0.010
Bachelors' degree	0.493	0.500	0	0.010
High school degree	0.376	0.484	0	0.010
High school dropout	0.006	0.078	0	0.010

Table A6: Summary statistics (continued)

	Mean	SD	Med.	Share Mi.
Panel D: Other Child Characteristics				
Child ever in gifted prog	0.243	0.429	0	0.031
Child ever in special ed prog	0.127	0.333	0	0.032
Child has repeated grade	0.122	0.327	0	0.021
Child qualifies for FRP lunch	0.598	0.490	1	0.256
Parent's rating of child health	0.014	1.000	1	0.005
Big 5 personality scores (indices)				
Conscientiousness	-0.003	0.684	0	0.007
Extroversion	0.005	0.618	-0	0.005
Neuroticism	-0.006	0.622	-0	0.009
Agreeableness	-0.003	0.644	0	0.008
Openness to experiences	-0.001	0.500	0	0.010
Panel E: Teacher Beliefs				
Perceptions of competence (stdized):				
Academic competence	0.003	0.992	-0	0.806
Social competence	-0.011	1.002	-0	0.805
Physical competence	0.003	1.006	-0	0.818
Teacher expectations for educ. attainment:				
Graduate degree	0.155	0.362	0	0.660
Bachelors' degree	0.358	0.480	0	0.660
High school degree	0.425	0.495	0	0.660
High school dropout	0.062	0.241	0	0.660
Panel F: School Quality				
Percent FRPL	0.000	0.000	0	0.000
Student-teacher ratio	0.000	0.000	0	0.000
Average math and reading achievement	0.000	0.000	0	0.000
Difference btwn math and reading achievement	0.000	0.000	0	0.000
Cohort slope of average achievement	0.000	0.000	0	0.000
Panel G: Child Ability Measures				
Math score percentile	58.477	29.214	60	0.000
Reading score percentile	55.386	28.907	54	0.004
Digit span score	14.246	3.718	14	0.041

Notes: All variables marked as indices are standardized to mean 0 and a standard deviation of 1 by year. All variables are taken from the first year in which we observe the child's over-confidence in reading or math. Except for the indicator that the child lives in a two-adult household, all variables in Panel C are reported by the child's primary caregiver. We identify two-parent households by whether a family has both a *head* and a *wife* in the main PSID.

Table A7: The persistence of math over- and under-confidence (weighted)

	(1)	(2)
Panel A: Math over-confidence	0.179***	0.177***
	(0.042)	(0.041)
N	1747	
Sample mean	0.036	
Panel B: Math under-confidence	0.046	0.041
	(0.033)	(0.033)
N	1747	
Sample mean	0.065	
Panel C: Math confidence (SD units)	0.260***	0.256***
	(0.039)	(0.040)
N	1747	
Sample mean	-0.008	
Basic controls:	✓	✓
Added background controls:		✓

Notes: This table regresses adolescent confidence outcomes on childhood math confidence with various controls. All controls are the same as described in Table 1. Observations are weighted so that the analysis sample matches the racial makeup of the US population in the 1990 census and so that the distribution of math percentile scores is uniform by decile, and the distribution of income is uniform by quartile. All controls that are indices are normalized relative to the weighted distribution. Standard errors are clustered by family, and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A8: Childhood math confidence and medium-term educational achievement and attainment (weighted)

Dependent variable:	Adolescent math scores		Adolescent reading scores		High school degree		College degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Panel A: Independent variables are binary measures of over- and under-confidence

Over-confidence	5.103**	5.039**	1.553	1.872	0.104***	0.110***	0.053	0.067*
	(2.349)	(2.318)	(2.082)	(2.028)	(0.039)	(0.039)	(0.035)	(0.035)
Under-confidence	-4.565**	-4.108**	1.046	0.901	0.042*	0.042*	-0.011	-0.007
	(1.995)	(2.008)	(1.891)	(1.922)	(0.023)	(0.023)	(0.043)	(0.041)
N	1747	1747	1745	1745	2714	2714	2725	2725
OC = -1*UC? *p-value*:	0.861	0.759	0.355	0.302	0.002	0.001	0.446	0.264

Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units

Confidence	2.871***	2.684***	-0.204	-0.020	0.027	0.026	0.017	0.016
	(0.826)	(0.841)	(0.832)	(0.834)	(0.017)	(0.017)	(0.015)	(0.015)
N	1747	1747	1745	1745	2714	2714	2725	2725
Sample mean of dep. var.	46.836		46.068		0.868		0.270	
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:		✓		✓		✓		✓

Notes: This table regresses educational achievement and attainment outcomes on childhood biased beliefs with various controls. Biased beliefs are measured in the earlies observed wave in the CDS with non-missing test scores and self-assessed ability. In Panel A, the outcome is regressed on an indicator for over-confidence, an indicator for under-confidence and our basic set of controls (in odd-numbered columns) and our extended set of controls (in even-numbered columns). The p-value listed tests whether the coefficient on the over-confidence indicator is equal to -1 times the coefficient on the under-confidence indicator. In Panel B, the outcome is regressed on our more continous measure of biased beliefs which has been standardized to have mean zero and standard deviation one in our sample and the same sets of controls. All controls are the same as described in Table 1, minus the controls for adolescent test score deciles. Observations are weighted so that our sample matches population shares in quintiles of income, in race categories, and in deciles of nationally-normed WJ-R math percentile scores. All controls that are indices are normalized relative to the weighted distribution. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A9: Childhood math confidence and college quality, college major choice, and post-college schooling (weighted)

Dependent variable:	College quality index		College's 75th pctile math SAT score		STEM major		Graduate degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Panel A: Independent variables are binary measures of over- and under-confidence

Over-confidence	0.035	0.083	11.390	10.273	0.167	0.211*	-0.030	-0.029
	(0.165)	(0.167)	(11.115)	(11.569)	(0.122)	(0.128)	(0.060)	(0.070)
Under-confidence	-0.118	-0.132	-12.123*	-12.976*	-0.121**	-0.113**	-0.046	-0.071
	(0.106)	(0.106)	(7.178)	(6.990)	(0.054)	(0.050)	(0.059)	(0.061)
N	1107	1107	1117	1117	736	736	810	810
OC = -1*UC? *p-value*:	0.689	0.813	0.957	0.845	0.732	0.472	0.359	0.281

Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units

Confidence	0.145**	0.137**	11.005***	10.256***	0.086**	0.074**	0.027	0.029
	(0.066)	(0.064)	(3.997)	(3.889)	(0.035)	(0.035)	(0.032)	(0.030)
N	1107	1107	1117	1117	736	736	810	810
Sample mean of dep. var.	0.091		599.785		0.186		0.180	
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:		✓		✓		✓		✓

Notes: This table regresses college outcomes outcomes on childhood biased beliefs with various controls. Biased beliefs are measured in the earlies observed wave in the CDS with non-missing test scores and self-assessed ability. In Panel A, the outcome is regressed on an indicator for over-confidence, an indicator for under-confidence and our basic set of controls (in odd-numbered columns) and our extended set of controls (in even-numbered columns). In Panel B, the outcome is regressed on our more continous measure of biased beliefs which has been standardized to have mean zero and standard deviation one in our sample and the same sets of controls. All controls are the same as described in Table 1, minus the controls for adolescent test score deciles. Observations are weighted so that our sample matches population shares in quintiles of income, in race categories, and in deciles of nationally-normed WJ-R math percentile scores. All controls that are indices are normalized relative to the weighted distribution. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A10: Childhood math confidence and employment outcomes (weighted)

Dependent variable:	Works in STEM		Non-STEM high-educ occ.		Ln(Earnings)		Unemployed this year	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Panel A: Independent variables are binary measures of over- and under-confidence

Over-confidence	0.067	0.064	-0.020	-0.020	-0.015	-0.006	-0.012	-0.009
	(0.054)	(0.046)	(0.035)	(0.034)	(0.135)	(0.136)	(0.036)	(0.036)
Under-confidence	-0.063**	-0.060***	0.018	0.021	-0.013	-0.018	-0.019	-0.024
	(0.025)	(0.023)	(0.040)	(0.038)	(0.074)	(0.072)	(0.020)	(0.021)
N	4592	4592	4592	4592	4423	4423	4975	4975
OC = -1*UC? *p-value*:	0.949	0.949	0.965	0.990	0.859	0.873	0.449	0.436

Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units

Confidence	0.042***	0.040***	-0.008	-0.006	-0.009	-0.001	-0.014	-0.013
	(0.016)	(0.014)	(0.016)	(0.015)	(0.047)	(0.046)	(0.013)	(0.012)
N	4592	4592	4592	4592	4423	4423	4975	4975
Sample mean of dep. var.	0.049		0.151		10.180		0.136	
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:		✓		✓		✓		✓

Notes: This table regresses employment outcomes on childhood biased beliefs with various controls. Biased beliefs are measured in the earlies observed wave in the CDS with non-missing test scores and self-assessed ability. In Panel A, the outcome is regressed on an indicator for over-confidence, an indicator for under-confidence and our basic set of controls (in odd-numbered columns) and our extended set of controls (in even-numbered columns). The p-value listed tests whether the coefficient on the over-confidence indicator is equal to -1 times the coefficient on the under-confidence indicator. In Panel B, the outcome is regressed on our more continous measure of biased beliefs which has been standardized to have mean zero and standard deviation one in our sample and the same sets of controls. All controls are the same as described in Table 1, minus the controls for adolescent test score deciles. Basic controls also include year fixed effects when the outcome is observed in a panel. Observations are weighted so that our sample matches population shares in quintiles of income, in race categories, and in deciles of nationally-normed WJ-R math percentile scores. All controls that are indices are normalized relative to the weighted distribution. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A11: Demographic predictors of over- and under-confidence (decile coefficients)

	Over-confidence	Under-confidence	Confidence (sd)
Math score deciles			
Decile 1	0.147***	-0.257***	1.918***
	(0.04)	(0.03)	(0.09)
Decile 2	0.212***	-0.257***	1.767***
	(0.03)	(0.03)	(0.07)
Decile 3	0.204***	-0.246***	1.564***
	(0.03)	(0.03)	(0.07)
Decile 4	0.140***	-0.250***	1.231***
	(0.02)	(0.02)	(0.06)
Decile 5	0.189***	-0.250***	1.075***
	(0.02)	(0.02)	(0.05)
Decile 6	-0.001	-0.163***	0.945***
	(0.01)	(0.03)	(0.06)
Decile 7	-0.003	-0.161***	0.675***
	(0.01)	(0.03)	(0.06)
Decile 8	-0.004	0.028	0.250***
	(0.01)	(0.03)	(0.05)
Decile 9	0.004	0.049	0.064
	(0.01)	(0.03)	(0.05)
Decile 10	0.000	0.000	0.000
	(.)	(.)	(.)
Reading score deciles			
Decile 1	0.160**	-0.026	0.281
	(0.07)	(0.08)	(0.21)
Decile 2	0.074	-0.021	0.114
	(0.07)	(0.08)	(0.21)
Decile 3	0.001	-0.030	-0.006
	(0.07)	(0.08)	(0.20)
Decile 4	0.021	-0.034	0.043
	(0.07)	(0.08)	(0.20)
Decile 5	0.001	-0.001	-0.098
	(0.07)	(0.08)	(0.20)
Decile 6	-0.012	0.006	-0.157
	(0.07)	(0.08)	(0.20)
Decile 7	0.002	0.010	-0.197
	(0.07)	(0.08)	(0.20)
Decile 8	-0.000	0.041	-0.240
	(0.07)	(0.08)	(0.20)
Decile 9	-0.018	0.051	-0.277
	(0.07)	(0.08)	(0.20)
Decile 10	-0.019	0.093	-0.301
	(0.07)	(0.08)	(0.20)
Mean of dependent variable	0.085	0.121	0.000
N	2985	2985	2985
R-squared	0.21	0.21	0.57

Notes: This table shows the coefficients on math and reading test score decile fixed effects that are not included in Table 2 due to space constraints.

Table A12: Benchmarking the relationships between confidence and long-run outcomes and test scores

	Math Score (1)	Reading Score (2)	HS grad (3)	College grad (4)	College quality ind. (5)	College math SAT 75p (6)	STEM major (7)	Grad degree (8)	STEM occup (9)	High-educ occup (10)	ln(Earnings) (11)	Unempl (12)
Panel A: Independent variables are binary measures of over- and under-confidence												
Math over-confidence	3.618**	0.544	0.054**	0.038	0.070	5.079	0.117	-0.007	0.023	-0.030	0.033	-0.029
	(1.464)	(1.319)	(0.026)	(0.024)	(0.135)	(11.253)	(0.095)	(0.083)	(0.017)	(0.027)	(0.083)	(0.029)
Math under-confidence	-6.482***	0.797	0.021	-0.056**	-0.136*	-11.503**	-0.149***	0.005	-0.049***	0.023	-0.089	0.007
	(1.475)	(1.407)	(0.017)	(0.027)	(0.080)	(5.706)	(0.035)	(0.046)	(0.015)	(0.032)	(0.057)	(0.016)
Math pctile/10	5.291***	1.289***	0.008***	0.029***	0.056***	4.068***	0.030***	0.015*	0.008***	0.005	0.060***	-0.012***
	(0.235)	(0.250)	(0.003)	(0.004)	(0.014)	(1.107)	(0.009)	(0.008)	(0.003)	(0.004)	(0.011)	(0.003)
Reading pctile/10	1.597***	6.387***	0.015***	0.022***	0.048***	3.850***	0.007	0.013	0.000	0.013***	0.014	-0.002
	(0.240)	(0.241)	(0.003)	(0.004)	(0.016)	(1.082)	(0.008)	(0.008)	(0.002)	(0.004)	(0.010)	(0.003)
N	1747	1745	2714	2725	1107	1117	736	810	4592	4592	4423	4975
Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units												
Math confidence	2.963***	0.223	0.017*	0.037***	0.060	4.795	0.076***	0.015	0.018***	0.004	0.058**	-0.021**
	(0.563)	(0.560)	(0.010)	(0.011)	(0.044)	(3.237)	(0.022)	(0.025)	(0.006)	(0.011)	(0.028)	(0.009)
Math pctile/10	5.583***	1.357***	0.011***	0.034***	0.062***	4.563***	0.038***	0.019**	0.009***	0.008	0.068***	-0.016***
	(0.260)	(0.274)	(0.004)	(0.005)	(0.016)	(1.260)	(0.009)	(0.009)	(0.003)	(0.005)	(0.012)	(0.004)
Reading pctile/10	1.655***	6.399***	0.016***	0.023***	0.050***	3.962***	0.009	0.013	0.000	0.013***	0.015	-0.002
	(0.240)	(0.242)	(0.003)	(0.004)	(0.016)	(1.089)	(0.008)	(0.008)	(0.002)	(0.004)	(0.010)	(0.003)
N	1747	1745	2714	2725	1107	1117	736	810	4592	4592	4423	4975

Notes: This table presents the same regressions as the even-numbered columns of Tables 3, 4, and 5, but replaces the math and reading test score decile fixed effects with linear terms for math and reading percentile scores divided by 10 (so that the coefficients can be interpreted in terms of increasing test scores by one decile). We use this table to benchmark the relationships between math confidence versus math test scores and long-term outcomes. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A13: Robustness to potential confounders

	Math Score (1)	Reading Score (2)	HS grad (3)	College grad (4)	College quality ind. (5)	College math SAT 75p (6)	STEM major (7)	Grad degree (8)	STEM occup (9)	High-educ occup (10)	ln(Earnings) (11)	Unempl (12)
Section 1: Controlling for childhood Big 5 personality traits												
Panel A: Independent variables are binary measures of over- and under-confidence												
Over-confidence	2.600*	-0.286	0.061**	0.025	-0.001	1.075	0.068	0.060	0.014	-0.030	0.075	-0.033
	(1.483)	(1.393)	(0.026)	(0.025)	(0.150)	(12.165)	(0.104)	(0.087)	(0.017)	(0.027)	(0.086)	(0.030)
Under-confidence	-5.808***	0.187	0.023	-0.060**	-0.123	-11.110*	-0.160***	0.017	-0.048***	0.025	-0.074	0.007
	(1.513)	(1.464)	(0.017)	(0.028)	(0.083)	(5.961)	(0.037)	(0.048)	(0.016)	(0.032)	(0.058)	(0.017)
N	1747	1745	2714	2725	1107	1117	736	810	4592	4592	4423	4975
Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units												
Confidence	2.824***	0.168	0.014	0.029***	0.033	3.194	0.077***	0.014	0.018***	-0.002	0.054*	-0.022**
	(0.569)	(0.579)	(0.010)	(0.011)	(0.046)	(3.442)	(0.024)	(0.025)	(0.006)	(0.012)	(0.029)	(0.010)
N		1745	2714	2725	1107	1117	736	810	4592	4592	4423	4975
Section 2: Controlling for parent and teacher expectations and investments												
Panel A: Independent variables are binary measures of over- and under-confidence												
Over-confidence	2.861*	-0.274	0.059**	0.028	0.061	5.025	0.089	0.050	0.012	-0.023	0.064	-0.037
	(1.487)	(1.385)	(0.025)	(0.024)	(0.153)	(12.230)	(0.099)	(0.087)	(0.017)	(0.026)	(0.085)	(0.030)
Under-confidence	-5.295***	0.398	0.015	-0.055**	-0.081	-9.065	-0.150***	0.007	-0.048***	0.031	-0.106*	0.011
	(1.520)	(1.460)	(0.017)	(0.028)	(0.081)	(5.946)	(0.038)	(0.049)	(0.015)	(0.033)	(0.059)	(0.018)
N	1747	1745	2714	2725	1107	1117	736	810	4592	4592	4423	4975
Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units												
Confidence	2.761***	0.165	0.017*	0.031***	0.044	4.228	0.078***	0.026	0.016***	0.001	0.065**	-0.025**
	(0.582)	(0.583)	(0.010)	(0.011)	(0.046)	(3.461)	(0.024)	(0.026)	(0.006)	(0.012)	(0.029)	(0.010)
N		1745	2714	2725	1107	1117	736	810	4592	4592	4423	4975
Section 3: Controlling for elementary school quality												
Panel A: Independent variables are binary measures of over- and under-confidence												
Over-confidence	2.938*	-0.195	0.060**	0.028	0.030	3.039	0.076	0.028	0.016	-0.024	0.060	-0.033
	(1.511)	(1.408)	(0.026)	(0.025)	(0.150)	(11.908)	(0.097)	(0.086)	(0.017)	(0.026)	(0.086)	(0.030)
Under-confidence	-5.931***	-0.097	0.020	-0.062**	-0.143*	-12.553**	-0.159***	0.006	-0.047***	0.026	-0.062	0.005
	(1.499)	(1.460)	(0.018)	(0.028)	(0.082)	(5.892)	(0.037)	(0.049)	(0.016)	(0.033)	(0.058)	(0.017)
N	1747	1745	2714	2725	1107	1117	736	810	4592	4592	4423	4975
Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units												
Confidence	2.944***	0.251	0.018*	0.034***	0.041	3.577	0.073***	0.018	0.018***	0.001	0.054*	-0.022**
	(0.574)	(0.582)	(0.010)	(0.011)	(0.046)	(3.426)	(0.023)	(0.025)	(0.006)	(0.012)	(0.029)	(0.010)
N		1745	2714	2725	1107	1117	736	810	4592	4592	4423	4975

Notes: This table presents the robustness of our main results to adding controls for potential confounders. In the first section, we add controls for measurements of children's big 5 personality traits taken at the same time as the confidence measurements (conscientiousness, openness, extroversion, agreeableness, and neuroticism). In the second section, we add controls for parent and teacher expectations and investment: how teachers rate the child's social, physical, and academic competency; whether parents report reading, playing sports, doing homework, playing games, expressing physical affection, and saying *I love you* more than once per week; and separate indicators for whether parents and teachers think the child will get a high school or bachelors degree. Finally, the third section adds controls for elementary school quality at the time of confidence measurement: the student-teacher ratio, the percent of students qualifying for free or reduced-price lunch, and three measures of school achievement *from 2009-2018*: the average math and reading score, the difference between math and reading scores, and the cohort slope on the average math and reading score. Each of these sets of controls is individually added to our main specification in the even-numbered columns of Tables 3, 4, and 5 – the sections are not cumulative. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A14: Correlations between childhood confidence and personality measures

	Math over-confidence		Math under-confidence		Math confidence (sd)	
	(1)	(2)	(3)	(4)	(5)	(6)
Conscientiousness	-0.023**	-0.024**	0.025**	0.028**	-0.226***	-0.232***
	(0.011)	(0.011)	(0.012)	(0.012)	(0.038)	(0.038)
Extroversion	0.000	-0.002	-0.001	0.000	0.027	0.022
	(0.010)	(0.009)	(0.010)	(0.010)	(0.032)	(0.032)
Neuroticism	0.014	0.013	0.005	0.004	0.046	0.046
	(0.012)	(0.012)	(0.013)	(0.013)	(0.042)	(0.042)
Agreeableness	-0.006	-0.009	-0.011	-0.007	0.075	0.068
	(0.015)	(0.015)	(0.014)	(0.014)	(0.048)	(0.049)
Openness	-0.017	-0.018	0.010	0.011	-0.160***	-0.163***
	(0.013)	(0.013)	(0.011)	(0.011)	(0.041)	(0.041)
General Confidence	—	0.020**	—	-0.033***	—	0.070**
		(0.008)		(0.009)		(0.028)
R-squared	0.009	0.023	0.005	0.013	0.026	0.029
N	2985	2985	2985	2985	2985	2985

Note: This table shows the relationship between math confidence and measures of childhood personality and general confidence. In columns 1 and 2 the outcome is our main binary measure of over- or under-confidence, respectively. In column 3, the outcome is our measure of the degrees of confidence that takes on values of -6 to 6, *standardized to have mean zero and standard deviation one in our sample*. All independent variables are recoded to zero if missing and we include a missing indicator (coefficient not shown). Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A15: Parent and teacher predictors of math over- and under-confidence

	Math over-confidence			Math under-confidence			Confidence (sd)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Teacher Perceptions									
Academic competence	0.015	0.017	0.016	-0.019	-0.019	-0.020	-0.006	-0.002	-0.008
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)
Social competence	-0.019	-0.016	-0.015	0.017	0.016	0.015	-0.029	-0.024	-0.020
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)
Physical competence	-0.015	-0.019	-0.018	-0.002	-0.000	-0.001	-0.026	-0.038	-0.037
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)
Teacher Expectations									
Expects grad degree	0.002	0.003	0.002	-0.073*	-0.073*	-0.052	0.153**	0.157**	0.134*
	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)	(0.07)	(0.07)	(0.07)
Expects bachelors' degree	0.010	0.009	0.012	0.041	0.040	0.048*	0.047	0.049	0.051
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)	(0.06)
Parent Investment									
Reads to child	0.008	0.008	0.006	0.024*	0.024*	0.025*	-0.016	-0.014	-0.016
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.03)
Art with child	-0.035*	-0.028	-0.031	-0.015	-0.020	-0.019	-0.060	-0.043	-0.048
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.05)	(0.05)
Sports with child	0.006	0.004	0.006	-0.030*	-0.026	-0.027*	0.077**	0.068*	0.076**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)
Homework with child	0.007	0.005	0.006	0.025*	0.026*	0.026*	-0.022	-0.028	-0.029
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.03)
Games with child	0.005	0.004	0.003	-0.030*	-0.032**	-0.033**	0.070*	0.071*	0.068*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)
Physical affection to child	0.028	0.029	0.027	-0.039	-0.039	-0.037	0.074	0.083	0.078
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.09)	(0.09)	(0.09)
Says *I love you* to child	-0.016	-0.011	-0.012	0.010	0.009	0.012	-0.008	0.010	0.009
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)	(0.05)
Parent Expectations									
Expects grad degree	-0.016	-0.015	-0.015	-0.043**	-0.044**	-0.020	0.036	0.036	0.019
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.05)
Expects bachelors' degree	-0.003	-0.001	0.000	0.003	0.003	0.014	0.024	0.032	0.029
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.03)
Digit span score	0.000	0.000	-0.000	-0.004*	-0.003*	-0.003*	0.009**	0.008**	0.009**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
General confidence	0.037***	0.037***	0.038***	-0.054***	-0.056***	-0.054***	0.208***	0.212***	0.210***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Added demographic controls		✓	✓		✓	✓		✓	✓
Added all other Table 2 controls			✓			✓			✓
N	2985	2985	2985	2985	2985	2985	2985	2985	2985
R-squared	0.20	0.21	0.22	0.20	0.21	0.23	0.57	0.57	0.58

Notes: All variables are taken from the first year in which we observe the child's confidence in math. Teacher and parent expectations are indicators for each adult's expected educational attainment for each child, and the omitted category is expecting a child to obtain a high school degree or less. Parent investment controls are indicators for doing each activity more than once per week. Teacher perceptions of competence in each domain are standardized to have mean zero and standard deviation one based on teacher reports of whether a child is extremely competent to not at all competent on a four-point scale. Additional controls in all columns include math and reading test score decile fixed effects, birth year, birth quarter, state, and age at which confidence was measured fixed effects. All controls are recoded to be zero if missing and the regressions include missing indicators for each variable (not shown). Standard errors are clustered by family.

Table A16: Robustness to definitions of confidence

	Math Score (1)	Reading Score (2)	HS grad (3)	College grad (4)	College quality (5)	College math SAT 75p (6)	STEM major (7)	Grad degree (8)	STEM occup (9)	High-educ occup (10)	ln(Earn) (11)	Unempl (12)
Panel A: Independent variables are binary measures of over- and under-confidence												
Main measure:												
Over-confidence	2.666*	-0.286	0.062**	0.031	0.037	3.133	0.076	0.032	0.014	-0.025	0.064	-0.035
	(1.496)	(1.385)	(0.026)	(0.024)	(0.148)	(11.829)	(0.097)	(0.087)	(0.017)	(0.026)	(0.085)	(0.030)
Under-confidence	-5.860***	0.162	0.022	-0.058**	-0.127	-11.312*	-0.162***	0.006	-0.049***	0.026	-0.075	0.005
	(1.497)	(1.452)	(0.017)	(0.028)	(0.082)	(5.925)	(0.036)	(0.048)	(0.016)	(0.033)	(0.057)	(0.017)
More strict (1):												
Over-confidence	2.412	0.091	0.034	0.016	0.052	9.116	-0.154	-0.042	0.019	-0.071***	0.042	-0.020
	(1.717)	(1.609)	(0.036)	(0.027)	(0.190)	(13.872)	(0.121)	(0.115)	(0.022)	(0.024)	(0.105)	(0.038)
Under-confidence	-7.246***	1.150	0.012	-0.066**	-0.144	-11.660*	-0.183***	-0.014	-0.056***	-0.009	-0.023	0.004
	(1.668)	(1.629)	(0.020)	(0.032)	(0.096)	(6.749)	(0.039)	(0.054)	(0.018)	(0.037)	(0.064)	(0.020)
More strict (2):												
Over-confidence	2.631*	-0.290	0.062**	0.030	0.038	3.173	0.075	0.032	0.014	-0.025	0.063	-0.035
	(1.495)	(1.384)	(0.026)	(0.024)	(0.148)	(11.827)	(0.097)	(0.087)	(0.017)	(0.026)	(0.085)	(0.030)
Under-confidence	-6.820***	1.046	0.021	-0.058*	-0.152	-11.870*	-0.165***	-0.012	-0.055***	-0.016	-0.010	0.001
	(1.622)	(1.595)	(0.019)	(0.031)	(0.093)	(6.464)	(0.039)	(0.052)	(0.017)	(0.035)	(0.061)	(0.019)
Less strict (1):												
Over-confidence	1.344	-0.161	0.043*	0.037	-0.000	0.537	0.066	0.030	0.014	-0.033	0.102	-0.028
	(1.406)	(1.300)	(0.024)	(0.023)	(0.126)	(9.982)	(0.073)	(0.076)	(0.015)	(0.025)	(0.076)	(0.026)
Under-confidence	-5.859***	-1.266	0.005	-0.069***	-0.135*	-12.247**	-0.128***	0.022	-0.048***	-0.003	-0.055	0.004
	(1.311)	(1.255)	(0.017)	(0.024)	(0.074)	(5.400)	(0.035)	(0.043)	(0.012)	(0.026)	(0.049)	(0.016)
Less strict (2):												
Over-confidence	1.873	0.411	0.057*	0.016	0.106	11.714	-0.038	0.012	0.011	-0.031	0.064	-0.015
	(1.607)	(1.570)	(0.030)	(0.024)	(0.156)	(12.051)	(0.081)	(0.102)	(0.017)	(0.025)	(0.089)	(0.031)
Under-confidence	-5.895***	-1.265	0.004	-0.071***	-0.136*	-12.345**	-0.128***	0.021	-0.048***	-0.002	-0.057	0.005
	(1.309)	(1.253)	(0.017)	(0.024)	(0.074)	(5.408)	(0.035)	(0.043)	(0.012)	(0.026)	(0.048)	(0.015)
Relative:												
Over-confidence	2.795*	2.308*	0.041*	-0.004	0.004	-5.672	0.066	0.121*	0.000	-0.030	0.049	-0.023
	(1.480)	(1.361)	(0.023)	(0.023)	(0.122)	(9.029)	(0.062)	(0.067)	(0.010)	(0.024)	(0.070)	(0.022)
Under-confidence	-9.674***	-1.848	0.025	-0.066*	-0.049	-6.820	-0.160***	0.003	-0.051***	0.003	0.035	-0.017
	(2.081)	(1.956)	(0.022)	(0.034)	(0.105)	(7.755)	(0.049)	(0.064)	(0.016)	(0.040)	(0.069)	(0.022)

Table A16: Robustness to definitions of confidence (continued)

	Math Score (1)	Reading Score (2)	HS grad (3)	College grad (4)	College quality (5)	College math SAT 75p (6)	STEM major (7)	Grad degree (8)	STEM occup (9)	High-educ occup (10)	ln(Earn) (11)	Unempl (12)
Continuous tails:												
Over-confidence	1.127	1.751	0.033	0.008	0.098	7.333	0.084	0.149*	0.011	-0.043**	0.055	-0.031
	(1.372)	(1.339)	(0.023)	(0.021)	(0.112)	(9.301)	(0.071)	(0.081)	(0.013)	(0.021)	(0.071)	(0.024)
Under-confidence	-6.680***	2.244	-0.001	-0.057*	-0.136	-12.011*	-0.191***	-0.017	-0.050***	-0.004	-0.046	0.017
	(1.664)	(1.655)	(0.021)	(0.032)	(0.100)	(6.948)	(0.038)	(0.052)	(0.018)	(0.036)	(0.067)	(0.021)
Main of averages:												
Over-confidence	–	–	0.008	0.036	-0.143	-11.712	-0.082	0.036	-0.015	-0.001	-0.071	0.002
			(0.041)	(0.032)	(0.144)	(14.373)	(0.095)	(0.122)	(0.012)	(0.033)	(0.124)	(0.043)
Under-confidence	–	–	0.017	-0.040	-0.087	-5.400	-0.116***	-0.049	-0.038**	0.028	-0.047	-0.035*
			(0.022)	(0.033)	(0.107)	(7.458)	(0.042)	(0.055)	(0.018)	(0.039)	(0.075)	(0.021)
Average of main:												
Over-confidence	–	–	0.057	0.023	0.031	1.166	0.036	0.110	0.005	-0.023	0.031	-0.016
			(0.036)	(0.028)	(0.177)	(15.192)	(0.117)	(0.120)	(0.016)	(0.030)	(0.107)	(0.038)
Under-confidence	–	–	0.012	-0.054	-0.062	-6.511	-0.186***	-0.084	-0.051**	0.030	-0.133	-0.019
			(0.023)	(0.036)	(0.113)	(7.963)	(0.057)	(0.065)	(0.023)	(0.041)	(0.082)	(0.022)

Table A16: Robustness to definitions of confidence (continued)

	Math Score (1)	Reading Score (2)	HS grad (3)	College grad (4)	College quality (5)	College math SAT 75p (6)	STEM major (7)	Grad degree (8)	STEM occup (9)	High-educ occup (10)	ln(Earn) (11)	Unempl (12)
Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units												
Main measure	2.827***	0.128	0.018*	0.033***	0.041	3.631	0.078***	0.022	0.018***	0.001	0.059**	-0.023**
	(0.569)	(0.580)	(0.010)	(0.011)	(0.046)	(3.417)	(0.023)	(0.025)	(0.006)	(0.012)	(0.029)	(0.009)
Percentiles	2.631***	0.356	0.016**	0.027***	0.047	3.814	0.062***	0.006	0.017***	-0.005	0.045*	-0.012
	(0.528)	(0.505)	(0.008)	(0.010)	(0.038)	(2.803)	(0.019)	(0.020)	(0.006)	(0.011)	(0.025)	(0.008)
Empirical dist	2.525***	0.318	0.018**	0.027***	0.027	2.517	0.065***	0.018	0.016***	0.006	0.050**	-0.019**
	(0.487)	(0.497)	(0.008)	(0.009)	(0.039)	(2.895)	(0.020)	(0.022)	(0.006)	(0.010)	(0.025)	(0.008)
Main of averages	–	–	0.016	0.019*	-0.048	-2.972	0.042*	0.047*	0.012*	-0.007	0.001	-0.009
			(0.010)	(0.011)	(0.048)	(3.633)	(0.025)	(0.026)	(0.007)	(0.012)	(0.031)	(0.010)
Average of main	–	–	0.017*	0.018	-0.038	-2.434	0.047*	0.040	0.010	-0.008	0.012	-0.009
			(0.010)	(0.011)	(0.048)	(3.609)	(0.025)	(0.026)	(0.007)	(0.012)	(0.031)	(0.010)

Notes: This table presents the robustness of our main results to changing our definitions of our main measures of confidence. All regressions estimate our main specification in the even-numbered columns of Tables 3, 4, and 5, replacing the main measure of over-confidence and under-confidence or the main measure of degrees of confidence with alternate definitions. Sample sizes for each regression are the same as in each main table. In Panel A, we iterate over our definitions of binary over- and under-confidence variables. Each pair of over- and under-confidence measures are estimated in the same regression. The definitions labeled 'more strict' or 'less strict' change the self-assessment and percentile score cutoffs in our main measure. The relative measure identifies children who score in the top or bottom 25 percent of test scores within each self-assessment bucket as under- or over-confident, respectively. The 'continuous tails' measure identifies over-confident children as those whose more continuous measure of confidence is between 3 and 6, and under-confident children as those whose continuous measure of confidence is between -6 and -3. Finally, the last two measures combine data over the two waves of the CDS where we observe confidence measurements, when available. The first averages test scores and self-reports over the two waves and then applies our main cutoffs, and the second averages the main measure over the two waves. In Panel B, we iterate over our definitions of the more continuous measure of biased beliefs. The one labeled 'percentiles' differences the percentile of children's self-assessment and their percentile score, and the one labeled 'empirical dist' assumes that children knew the empirical distribution of self-reports and should have correspondingly reported their self-assessments (instead of assuming a uniform distribution). Again, the last two measures combine data over the two waves were possible: the first averages test scores and self-reports over the two waves and then applies the transformation to the same scale, and the second averages the main measure over the two waves. Further iteration is presented in specification charts for each outcome, found in Appendix Figures A5-A16. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A17: Sample means by whether missing confidence variables in the CDS

	Sample	Non-Sample	p-value
	(1)	(2)	(1)=(2)
Panel A: Demographic Characteristics			
Child is female	0.497	0.458	0.089
	(2985)	(578)	
Child is white	0.458	0.481	0.303
	(2985)	(578)	
Child is black	0.417	0.370	0.036
	(2985)	(578)	
Child is hispanic	0.075	0.076	0.928
	(2985)	(578)	
Child's birth order	1.625	1.521	0.067
	(2645)	(457)	
Child's birth year	1990.020	1991.478	0.000
	(2985)	(573)	
Panel B: Parent and Family Characteristics			
Father at least graduated high school	0.835	0.811	0.256
	(1882)	(365)	
Father at least has bachelors	0.257	0.260	0.880
	(1883)	(365)	
Mother at least graduated high school	0.817	0.735	0.000
	(2657)	(499)	
Mother at least has bachelors	0.134	0.123	0.490
	(2648)	(496)	
Total taxable family income (thous 2016 USD)	69.777	61.977	0.032
	(2985)	(578)	
HH lives in public housing	0.061	0.076	0.178
	(2985)	(577)	
HH receives food stamps	0.198	0.213	0.404
	(2985)	(577)	
Two adults in HH	0.645	0.666	0.329
	(2985)	(578)	
Panel C: Other Child Characteristics			
Child ever in gifted prog	0.243	0.077	0.000
	(2893)	(568)	
Child ever in special ed prog	0.127	0.067	0.000
	(2888)	(568)	
Child has repeated grade	0.122	0.033	0.000
	(2921)	(568)	
Child qualifies for FRP lunch	0.598	0.510	0.005
	(2220)	(288)	
Parent's rating of child health	0.014	0.025	0.802
	(2969)	(572)	
# Siblings in the HH	1.415	1.178	0.000
	(2985)	(578)	
Big 5 personality scores (indices)			
Conscientiousness	-0.003	0.014	0.754
	(2964)	(153)	
Extroversion	0.005	0.060	0.282
	(2970)	(154)	
Neuroticism	-0.006	0.040	0.374
	(2957)	(152)	
Agreeableness	-0.003	0.025	0.605
	(2962)	(153)	
Openness to experiences	-0.001	-0.069	0.102
	(2955)	(151)	
Panel D: Child Ability Measures			
Math score percentile	58.477	49.256	0.000
	(2985)	(156)	
Reading score percentile	55.386	52.587	0.449
	(2973)	(63)	
Digit span score	14.246	7.403	0.000
	(2863)	(149)	

Notes: This table regresses an indicator for whether a child is in our final sample on child characteristics. The sample is all 3563 children in the CDS survey. 578 children are dropped from our analysis sample. These are children for whom we never observe *both* a self-assessed and observed ability measure. Of those, 99 percent are missing a self-assessed measure and 73 percent are missing a math test score.

Table A18: Correlations between math confidence and other attitudes

| | Math | | | General Conf |
	Over-Conf	Under-Conf	Confidence (sd)	
Panel A: Other Math Attitudes				
Math skill relative to peers	0.275	-0.307	0.534	0.242
Expected performance in math this year	0.189	-0.219	0.403	0.209
How good at learning new thing in math	0.152	-0.190	0.316	0.242
How easy is math for you	0.078	-0.095	0.166	0.044
How useful is what you learn in math	0.055	-0.056	0.130	0.207
Being good in math is important	0.063	-0.057	0.146	0.199
Working on math is interesting	0.157	-0.120	0.291	0.167
How much do you like math	0.240	-0.189	0.404	0.142
Panel B: Social and School Performance				
Do you feel like part of your school	-0.000	-0.036	0.054	0.213
Do you feel close to people at your school	0.001	-0.051	0.049	0.247

Note: This table shows the partial correlations between over- and under-confidence in math and general confidence and children's other attitudes towards math and social experiences at school after partialling out the relationship with math test score deciles.

Table A19: Childhood math confidence and average employment outcomes from age 28-33

Dependent variable:	Works in STEM (non-health)		Non-STEM high-educ occ.		Ln(Earnings)		Unemployed this year	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Panel A: Independent variables are binary measures of over- and under-confidence

Over-confidence	0.011	0.015	-0.034	-0.041	0.122	0.132	-0.031	-0.035
	(0.017)	(0.017)	(0.030)	(0.032)	(0.109)	(0.109)	(0.035)	(0.035)
Under-confidence	-0.039**	-0.040**	0.022	0.020	-0.027	-0.030	0.025	0.021
	(0.019)	(0.019)	(0.039)	(0.039)	(0.073)	(0.075)	(0.022)	(0.022)
N	1301	1301	1301	1301	1269	1269	1364	1364
OC = -1*UC? *p-value*:	0.262	0.318	0.803	0.687	0.463	0.436	0.881	0.735

Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units

Confidence	0.017**	0.017**	0.003	0.004	0.084**	0.089**	-0.024*	-0.024*
	(0.007)	(0.007)	(0.013)	(0.014)	(0.038)	(0.039)	(0.013)	(0.013)
N	1301	1301	1301	1301	1269	1269	1364	1364
Sample mean of dep. var.	0.043		0.167		10.227		0.141	
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:		✓		✓		✓		✓

Notes: This table regresses employment outcomes on childhood biased beliefs with various controls. Biased beliefs are measured in the earlies observed wave in the CDS with non-missing test scores and self-assessed ability. In Panel A, the outcome is regressed on an indicator for over-confidence, an indicator for under-confidence and our basic set of controls (in odd-numbered columns) and our extended set of controls (in even-numbered columns). The p-value listed tests whether the coefficient on the over-confidence indicator is equal to -1 times the coefficient on the under-confidence indicator. In Panel B, the outcome is regressed on our more continous measure of biased beliefs which has been standardized to have mean zero and standard deviation one in our sample and the same sets of controls. All controls are the same as described in Table 1, minus the controls for adolescent test score deciles. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A20: Comparing predictiveness of biased beliefs and Big-Five traits

	Math Score (1)	Reading Score (2)	HS grad (3)	College grad (4)	College quality ind. (5)	College math SAT 75p (6)	STEM major (7)	Grad degree (8)	STEM occup (9)	High-educ occup (10)	ln(Earnings) (11)	Unempl (12)
Panel A: Independent variables are binary measures of over- and under-confidence												
Math over-confidence	2.485*	-0.440	0.061**	0.023	-0.004	0.517	0.053	0.062	0.013	-0.033	0.072	-0.033
	(1.484)	(1.387)	(0.026)	(0.025)	(0.147)	(12.009)	(0.102)	(0.087)	(0.017)	(0.027)	(0.086)	(0.030)
Math under-confidence	-5.633***	0.473	0.023	-0.055**	-0.107	-10.609*	-0.155***	0.021	-0.049***	0.025	-0.078	0.008
	(1.495)	(1.465)	(0.017)	(0.028)	(0.081)	(5.941)	(0.038)	(0.048)	(0.016)	(0.032)	(0.057)	(0.017)
Conscientiousness	-0.944	-0.026	0.021	0.051***	0.130**	6.120	0.009	0.037	0.002	0.038**	0.030	-0.004
	(0.913)	(0.924)	(0.014)	(0.015)	(0.064)	(4.777)	(0.039)	(0.037)	(0.010)	(0.016)	(0.045)	(0.014)
Extroversion	-0.109	0.020	0.001	0.007	-0.069	-3.263	-0.057**	0.011	-0.016**	0.012	0.029	-0.019*
	(0.712)	(0.695)	(0.011)	(0.012)	(0.053)	(4.101)	(0.029)	(0.029)	(0.007)	(0.013)	(0.033)	(0.010)
Agreeableness	-0.611	-0.342	0.039**	0.020	-0.052	-4.402	-0.041	0.039	-0.006	0.002	0.063	-0.002
	(1.086)	(1.084)	(0.018)	(0.017)	(0.072)	(5.848)	(0.051)	(0.045)	(0.011)	(0.019)	(0.048)	(0.015)
Openness	-0.789	0.706	-0.036**	-0.036**	-0.035	-0.270	0.021	-0.078**	-0.019**	-0.027*	-0.023	0.036***
	(0.922)	(0.950)	(0.014)	(0.015)	(0.063)	(4.818)	(0.038)	(0.034)	(0.009)	(0.016)	(0.042)	(0.013)
Neuroticism	-0.640	0.549	0.015	0.051***	0.019	-1.238	-0.069**	0.016	-0.005	0.009	-0.084*	0.006
	(0.933)	(0.964)	(0.015)	(0.017)	(0.066)	(4.904)	(0.032)	(0.034)	(0.008)	(0.019)	(0.045)	(0.014)
Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units												
Math confidence	2.775***	0.080	0.014	0.027**	0.030	3.262	0.076***	0.014	0.019***	-0.004	0.054*	-0.023**
	(0.568)	(0.581)	(0.010)	(0.011)	(0.046)	(3.442)	(0.025)	(0.025)	(0.006)	(0.012)	(0.028)	(0.009)
Conscientiousness	-1.007	-0.042	0.021	0.051***	0.128**	5.933	0.004	0.036	0.003	0.037**	0.030	-0.003
	(0.914)	(0.923)	(0.014)	(0.016)	(0.064)	(4.749)	(0.040)	(0.038)	(0.010)	(0.016)	(0.045)	(0.014)
Extroversion	-0.191	0.017	0.000	0.007	-0.070	-3.356	-0.059**	0.010	-0.016**	0.013	0.028	-0.018*
	(0.713)	(0.697)	(0.011)	(0.012)	(0.053)	(4.100)	(0.030)	(0.029)	(0.007)	(0.013)	(0.032)	(0.010)
Agreeableness	-0.684	-0.315	0.039**	0.020	-0.053	-4.516	-0.042	0.039	-0.007	0.003	0.061	-0.002
	(1.086)	(1.082)	(0.018)	(0.017)	(0.072)	(5.796)	(0.051)	(0.045)	(0.012)	(0.019)	(0.048)	(0.015)
Openness	-0.718	0.715	-0.036**	-0.034**	-0.035	-0.246	0.020	-0.076**	-0.018**	-0.028*	-0.023	0.035***
	(0.925)	(0.950)	(0.014)	(0.015)	(0.062)	(4.826)	(0.038)	(0.033)	(0.009)	(0.016)	(0.042)	(0.013)
Neuroticism	-0.700	0.552	0.015	0.051***	0.019	-1.215	-0.069**	0.017	-0.005	0.009	-0.085*	0.006
	(0.935)	(0.964)	(0.015)	(0.017)	(0.066)	(4.924)	(0.032)	(0.034)	(0.008)	(0.019)	(0.045)	(0.014)

Notes: This table presents the estimates from Panel A of Table A13 but includes the coefficients on the childhood personality measures. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A21: Math confidence and young adult social outcomes

Dependent variable:	In a romantic relationship		Mental health		Social anxiety		Drinks alcohol often		Dangerous behavior	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Panel A: Independent variables are binary measures of over- and under-confidence

Over-confidence	-0.060**	-0.063**	-0.038	-0.023	-0.040	-0.043	0.020	0.019	0.048	0.051
	(0.026)	(0.026)	(0.048)	(0.048)	(0.055)	(0.055)	(0.014)	(0.014)	(0.043)	(0.044)
Under-confidence	-0.004	-0.001	-0.034	-0.036	-0.001	-0.000	0.013	0.015	-0.022	-0.022
	(0.023)	(0.023)	(0.034)	(0.034)	(0.044)	(0.044)	(0.015)	(0.015)	(0.029)	(0.029)
N	10389	10389	10360	10360	10374	10374	10360	10360	10277	10277
OC = -1*UC? *p-value*:	0.064	0.066	0.218	0.314	0.553	0.535	0.113	0.102	0.621	0.584

Panel B: Independent variable is degrees of over- and under-confidence in standard deviation units

Confidence	-0.005	-0.005	0.008	0.010	-0.016	-0.015	-0.001	-0.002	0.018	0.018
	(0.011)	(0.010)	(0.017)	(0.017)	(0.021)	(0.021)	(0.006)	(0.006)	(0.015)	(0.015)
N	10389	10389	10360	10360	10374	10374	10360	10360	10277	10277
Sample mean of dep. var.	0.551		0.001		0.000		0.105		-0.002	
Basic controls:	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Added background controls:		✓		✓		✓		✓		✓

Notes: This table regresses social (placebo) outcomes outcomes on childhood biased beliefs with various controls. Biased beliefs are measured in the earlies observed wave in the CDS with non-missing test scores and self-assessed ability. In Panel A, the outcome is regressed on an indicator for over-confidence, an indicator for under-confidence and our basic set of controls (in odd-numbered columns) and our extended set of controls (in even-numbered columns). The p-value listed tests whether the coefficient on the over-confidence indicator is equal to -1 times the coefficient on the under-confidence indicator. In Panel B, the outcome is regressed on our more continous measure of biased beliefs which has been standardized to have mean zero and standard deviation one in our sample and the same sets of controls. All controls are the same as described in Table 1, minus the controls for adolescent test score deciles. Basic controls also include year fixed effects when the outcome is observed in a panel. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

Table A22: Heterogeneity by over- and under-confidence using the degrees of confidence measure

	Math Score (1)	Reading Score (2)	HS grad (3)	College grad (4)	College quality (5)	College math SAT 75p (6)	STEM major (7)	Grad degree (8)	STEM occup (9)	High-educ occup (10)	ln(Earnings) (11)
Math confidence (sd)	3.100***	0.905	0.022	0.047**	-0.002	-0.714	0.015	0.009	0.012	0.034*	0.100**
	(1.042)'	(1.018)	(0.016)	(0.019)	(0.065)	(4.979)	(0.039)	(0.037)	(0.010)	(0.020)	(0.042)
Confidence (sd)*Over	-1.662	-3.046	0.011	-0.023	-0.091	-6.059	-0.193	-0.232*	-0.001	-0.055*	-0.198
	(1.875)'	(1.889)	(0.046)	(0.035)	(0.234)	(18.494)	(0.142)	(0.132)	(0.024)	(0.030)	(0.146)
Confidence (sd)*Under	-0.254	-1.621	-0.067	0.008	-0.279	-12.113	0.108	-0.097	0.010	-0.133	-0.033
	(3.621)'	(4.425)	(0.041)	(0.084)	(0.277)	(17.160)	(0.089)	(0.159)	(0.030)	(0.097)	(0.176)
Math over-confidence	-0.389	5.185*	-0.010	-0.016	0.225	16.374	0.346	0.472**	-0.002	-0.003	0.226
	(2.999)'	(3.074)	(0.069)	(0.052)	(0.334)	(27.290)	(0.218)	(0.227)	(0.034)	(0.042)	(0.220)
Math under-confidence	-3.173	0.584	-0.091	0.015	-0.620	-33.718	0.013	-0.172	-0.018	-0.193	0.014
	(6.610)'	(7.752)	(0.072)	(0.147)	(0.471)	(29.471)	(0.144)	(0.270)	(0.058)	(0.171)	(0.302)
N	1747	1745	2714	2725	1107	1117	736	810	4592	4592	4423
$Slope_{Over} = Slope_{Under}$	0.712	0.760	0.181	0.727	0.589	0.802	0.065	0.500	0.762	0.428	0.454
$Slope_{Over} = Slope_{Under} = Slope_{Neither}$	0.674	0.266	0.233	0.801	0.574	0.752	0.171	0.192	0.943	0.101	0.396

Notes: This table estimates our main specification for our more continuous degrees of confidence measure in standard deviation units (found in the even-numbered columns of Panel B in Tables 3, 4, and 5), but adds indicators for being over- and under-confident according to this measure and the interactions between the degrees of confidence measure and the indicators. Any student whose difference between their self-assessed bin from 1-7 and the bin they should have reported given their test scores is greater than two is considered over-confident and any student whose difference is less than negative two is considered under-confident. Standard errors are clustered at the family level and included in parentheses below each estimate. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 percent level, respectively.

B   Appendix B: Constructing Indices

College quality measures:

Using restricted data from the TAS, we identify the first college that each child in our sample attended, if they attended college. We then match those schools to college quality data from the first year that they attended the college. Following Cohodes and Goodman (2014), we construct an index of college quality by taking the first component from a principal component analysis of colleges' 75th-percentile math SAT scores among incoming freshmen, graduation rates, and per-pupil instructional expenditures, separately by year from 2005-2019.

We impute SAT scores where possible to increase our sample size; some schools report 75th-percentile math ACT scores but not SAT scores. For those schools, we impute 75th-percentile math SAT scores as predicted values from a regression of 75th-percentile SAT scores on 75th-percentile ACT scores among schools with both measures. We also use the 6-year graduation rate rather than the 4-year graduation rate because the 6-year rate is available for more schools and the two measures are highly correlated.

Depending on the year, the first principal component captures 70-80 percent of the variation between these three variables and assigns nearly equal weights to all three variables in all years. We standardize the first principal component to have mean 0 and standard deviation 1 in the full sample of four-year colleges in the US by year, and call this our college quality index.

Secondary outcome variables:

To minimize the number of outcomes and controls include in our analysis, we create many indices of similar variables. Here we list each index with its underlying variables. All underlying variables are scales from 1-3, 1-4, 1-5, or 1-7. When the variable applies to parents, we standardize by year before taking the average. When the variable applies to children, we standardize by year and age group (8-11, 12-14, and 15-19).

Adult math confidence:

- How good would you be in a career that required you to use math?

- How good would you be in a career that required you to use physical science or technology?

Adult reading confidence:

- How good would you be in a career that required you to read and write a lot?

Adult general academic confidence:

- How good would you be in a career that required you to be creative?

- How good are you at solving problems you encounter?

- How good are you at logical, analytic thinking?

- How intelligent are you, compared to others?

- How good are you at listening to and understanding others?

- How good are you at teaching and explaining to others?

Adult career confidence:

- How successful do you think you could be in the type of job you most want?

- How likely do you think you are to end up in the job you most want at age 30?

Adult general confidence: (variables marked with a * are flipped so that a higher score means more confident)

- How confident are you, compared with others?

- How decisive are you, compared with others?

- How independent are you, compared with others?

- How good are you at being a leader?

- How good are you at supervising others?

- How often do you feel discouraged about the future*

- How often, in the last month, did you feel that you had something important to contribute to society?

- How often, in the last month, did you feel good at managing responsibilities of daily life?

- How often, in the last month, did you feel confident to think or express your own ideas and opinions?

- How often, in the last month, did you feel that your life had a direction or purpose?

Adult Big-Five personality measures: (variables marked with a * are flipped so that a higher score means more conscientious, agreeable, etc.)

- Conscientiousness:

    - You are someone who does a thorough job. Does this describe you not at all, a little, some, or a lot?
    - You are someone who tends to be lazy. Does this...?*
    - You are someone who does things efficiently. Does this...?

- Agreeableness:

    - You are someone who is sometimes rude to others. Does this...?*
    - You are someone who has a forgiving nature. Does this...?
    - You are someone who is considerate and kind to almost everyone. Does this...?

- Extroversion:

    - You are someone who is talkative. Does this...?
    - You are someone who is outgoing, sociable. Does this...?
    - You are someone who is reserved. Does this...?*

- Neuroticism:

    - You are someone who worries a lot. Does this...?
    - You are someone who gets nervous easily. Does this...?
    - You are someone who is relaxed, handles stress well. Does this...?*

- Openness to experience:

    - You are someone who is original, comes up with new ideas. Does this...?
    - You are someone who values artistic experiences. Does this...?
    - You are someone who has an active imagination. Does this...?

Dangerous behavior index:

- How often in the last 6 months did you do something you knew was dangerous just for the thrill of it?

- How often in the last 6 months did you damage public or private property?

- How often in the last 6 months did you get into a physical fight?

- How often in the last 6 months did you drive when you were drunk or high on drugs?

- How often in the last 6 months did you ride with a driver who had too much to drink?

Control variables:

Child general confidence:
- Does the statement never, sometimes, always apply to you ... I do things as well as most people

- ... When I do something, I do it well

- ... I'm as good as most other people

- ... A lot of things about me are good

- ... I have a lot to be proud of

Child Big-Five personality measures, reported by primary caregiver: (variables marked with a * are flipped so that a higher score means more conscientious, agreeable, etc.)

- Conscientiousness:

  - According to [child's] behavior, [he/she] cheats or tells lies*
  - ... [he/she] has difficulty concentrating, cannot pay attention for long*
  - Thinking about [child], tell me if [child] waits [his/her] turn in games and other activities
  - ... tell me if [child] does neat, careful work
  - ... tell me if [child] usually does what you tell [him/her] to do

- Agreeableness:

  - ... [he/she] argues too much*
  - ... [he/she] bullies or is cruel or mean to others*
  - ... [he/she] is disobedient*
  - ... [he/she] has trouble getting along with other children*

- ... [he/she] is stubborn, sullen, or irritable*
- ... [he/she] breaks things on purpose or deliberately destroys [his/her] own or another's things*
- ... tell me if [child] is cheerful, happy
- ... tell me if [child] gets along well with other children
- ... tell me if [child] is admired and well-liked by other children

- Extroversion:

  - ... [he/she] is withdrawn, does not get involved with others*
  - ... [he/she] demands a lot of attention

- Neuroticism:

  - ... [he/she] has sudden changes in mood or feeling
  - ... [he/she] is rather high strung, tense and nervous
  - ... [he/she] is too fearful or anxious
  - ... [he/she] has a lot of difficulty getting [his/her] mind off certain thoughts
  - ... [he/she] feels others are out to get [him/her]
  - ... [he/she] worries too much
  - ... tell me if [child] can get over being upset quickly*

- Openness to experience:

  - ... [he/she] is impulsive, or acts without thinking
  - ... [he/she] clings to adults*
  - ... [he/she] hangs around with kids who get into trouble
  - ... tell me if [child] is curious and exploring, likes new experiences

Parent adherence to traditional gender norms: (variables marked with a * are flipped so that a higher score means more traditional gender norms)

- Most of the important decisions in the life of the family should be made by the man of the house

- Women are much happier if they stay at home and take care of their children

- There is some work that is men's and some that is women's and they should not be doing each other's

- It is much better for everyone if the man earns the living and the woman takes care of the home and family

- It is more important for a wife to help her husband's career than to have one herself

- Preschool children are likely to suffer if their mother is employed

- An employed mother can establish as warm and secure a relationship with her children as a mother who is not employed*

- Parents should encourage just as much independence in their daughters as their sons*

- A father should be as heavily involved in the care of his child as the mother*

- If a husband and wife both work full-time, they should share household tasks equally*

Parent aggravation in parenting:

- Thinking about [child], there are some things that [he/she] does that really bother me a lot

- ... I find myself giving up more of my life to meet [child's] needs than I ever expected

- ... I often feel angry with [child]

- Thinking about my child[ren], being a parent is harder than I thought it would be

- ... I feel trapped by my responsibilities as a parent

- ...I find that taking care of my child[ren] is much more work than pleasure

- ...I often feel tired, worn out, or exhausted from raising a family

Parent self-esteem: (variables marked with a * are flipped so that a higher score means higher self-esteem)

- I feel that I'm a person of worth, at least on an equal basis with others

- I feel that I have a number of good qualities

- All in all, I am inclined to feel that I am a failure*

- I am able to do things as well as most other people

- I feel I do not have much to be proud of*

- I take a positive attitude toward myself

- On the whole, I am satisfied with myself

- I wish I could have more respect for myself*

- I certainly feel useless at times*

- At times I think I am no good at all*

Parent self-efficacy: (variables marked with a * are flipped so that a higher score means higher self-efficacy)

- There is really no way I can solve some of the problems I have*

- Sometimes I fell that I'm being pushed around in life*

- I have little control over the things that happen to me*

- I can do just about anything I really set my mind to

- I often feel helpless in dealing with the problems of life*

- What happens to me in the future most depends on me

- There is little I can do to change many of the important things in my life*

C Biased Beliefs and Other Attitudes Towards School

Our confidence measures consistently correlate with children's other attitudes towards math in ways we would expect. Appendix Table A18 shows the pairwise correlations between children's attitudes towards math and school, our measures of over- and under-confidence in math, and the general confidence index. Over-confidence in math is positively correlated with children's self-assessed ability relative to their peers, their expected performance in math that year, how good they think they are at learning a new skill in math, how interesting they think math is, and how much they like math ($\rho \in [0.15, 0.28]$). All of the same correlations are negative and of similar magnitude for children who are under-confident in math. The correlations between over- and under-confidence and how easy, useful, or important math is are much smaller in magnitude but have the expected signs. There are very similar patterns using the more continuous measure of math confidence. General confidence is also positively correlated with these attitudes ($\rho \in [0.14, 0.24]$), except for how easy a child thinks math is.

On the other hand, whether children report feeling like part of their school community or close to their peers are both uncorrelated with math over- or under-confidence ($\rho < |0.05|$), but are positively correlated with our index of general confidence ($\rho \approx 0.23$). Together, these patterns suggest that our measures isolate over- and under-confidence in the particular domain of math, but our regressions also control for general confidence and other measures of child ability to further isolate the relationship between children's biased beliefs about their math ability and their medium- and long-run outcomes.

D   Over- versus under-confidence

One ex-ante strength of our binary measures of biased beliefs is that they offer a clear way to test whether over- and under-confidence correlate with later-life outcomes with symmetric magnitudes; we display p-values for all of these comparisons at the bottom of Panel A in Tables 3, 4, and 5. In practice, we find that the coefficient magnitudes for over- and under-confidence are only significantly different for two of our twelve outcomes: high-school graduation and working in STEM. Over-confidence predicts high-school graduation significantly more strongly than does under-confidence, while only under-confidence predicts working in STEM.

We also test for heterogeneity in the direction of biased beliefs using our more continuous measure of degrees of confidence. In Appendix Table A22, we allow the coefficient on this measure to differ by whether a child is over-confident (assessing one's ability at least 3 bins, or 42 percentiles, too high), under-confident (assessing one's ability at least 3 bins too low), or neither. We cannot reject that the slope of the outcome with respect to the degrees of confidence variable is equal across these groups for any outcome, though we are likely under-powered to do so. This result supports the functional-form assumptions we make in Panel B of each of our main tables, where degrees of confidence enter linearly for all outcomes. More broadly, these results and those using our binary measures of over- and under-confidence suggest that over- and under-confidence largely predict similarly-sized, oppositely-signed gaps in long-term educational and employment outcomes.

E Measuring key confounders

Big-Five Personality Traits

In Section 7.1, we show that our results are robust to controlling for children's Big-Five personality traits. The CDS did not measure these traits using standard psychometric scales, so we approximate them using parents' reports of child behavior. See Appendix B for the variables that make up the index for each trait.

While our proxies for these traits may be noisy, they do correlate with other variables in expected ways. First, the TAS did collect standard psychometric scales to measure Big-5 traits among young adults, and our childhood measures correlate with these adult measures at levels similar to other estimates of the longitudinal persistence of the Big-Five traits (Hampson and Goldberg, 2006; Edmonds et al., 2013). The intercorrelations of our childhood Big-Five personality measures are also broadly similar to those found in studies that use more standard scales to measure these traits (van den Akker et al., 2014; Soto, 2016). Finally, if we regress contemporaneous math and reading cognitive test scores on our childhood Big-Five measures while controlling for IQ, race, and gender, the coefficients on the Big-Five characteristics follow similar patterns as those reported in Almlund et al. (2011) (results available upon request).

We also consider the extent to which the Big-Five traits predict long-term outcomes in our data. We present the coefficients on each personality trait in the specifications above in Appendix Table A20. Some correlations are consistent with prior estimates of the contemporaneous links between personality and economic outcomes (Almlund et al., 2011; Heckman et al., 2019), but we find fewer significant relationships than expected. These null results may reflect noise in our constructed measures of personality, or they could reflect that childhood personality traits only moderately persist into adulthood (Hampson and Goldberg, 2006; Edmonds et al., 2013).

Parent and Teacher Beliefs and Investment

In Section 7.1, we also test that our main results are robust to controlling for measures of parents' and teachers' investments and beliefs. We construct these controls using data from the CDS. We

measure caregiver investment from self-reports of how often they do certain activities with their child (e.g. do homework, play games), and we observe both caregiver and teacher reports of the level of educational attainment they expect the child to achieve. Our data also include teacher ratings of the student's academic, social, and physical competence on a scale from 1 (extremely competent) to 4 (not at all competent); we standardize these ratings by year and age group as a measure of teacher perceptions, which likely relate to teacher investment. See Appendix Table A6 for summary statistics on these variables.

We have relatively low data coverage for teacher reports because the CDS only interviewed elementary school teachers, while the CDS sample includes older children, and because questionnaires were mailed to teachers and had relatively low response rates. In total, 54 percent of our final sample had a teacher respond in any wave of the CDS. We observe teacher predictions of educational attainment in the same year in which we observe biased beliefs for 34 percent of our sample, and we observe teacher reports of student competence for 20 percent of our sample (this variable was only recorded in the 1997 CDS). In contrast, we observe caregiver reports of investment and predicted educational attainment for more than 99 percent of our sample.

These measures of teacher and parent beliefs and investments correlate with children's beliefs in math in our sample, making them potential confounders of the main associations we estimate. Appendix Table A15 regresses childhood over- and under-confidence in math on our variables for teacher perceptions and expectations, parent investment and expectations, and child test scores. First, teacher expectations of educational attainment predict children's biased beliefs: children that teachers think are going to get a graduate degree are more confident, and in particular are less likely to be under-confident. Next, parent investment predicts children's under-confidence but not over-confidence: children whose parents read or do homework with them more than once per week are (marginally significantly) more likely to be under-confident in math, whereas we find suggestive evidence that children with parents who play sports or games with them are less likely to be under-confident. Similar to the results for teacher expectations of educational attainment, children whose parents think they are likely to get a graduate degree are less likely to be under-confident.

Overall, these results show that our measures of children's over- and under-confidence in math are correlated with parent and teacher beliefs and investment in largely expected ways, even when we control for children's ability and general confidence. This suggests that one mechanism through which childhood over- and under-confidence could relate to long-term outcomes could be through parent and teacher behavior. However, adding controls for these adult beliefs and behaviors does not change the relationship between children's over- and under-confidence and long-run outcomes – if anything, children's biased beliefs become *more* predictive of long-run outcomes when we condition on these variables.

School quality when confidence is measured

Finally, Section 7.1 tests that our results are robust to controlling for the quality of the school that children were attending when we observe their first measures of over- and under-confidence in math. We match respondents with school IDs using restricted data from the CDS.

Then, we collect data on free or reduced-price lunch and student-teacher ratios from the NCES, while we collect data on testing achievement from the Stanford Education Data Archive (SEDA; Fahle et al., 2021). The measures are scaled relative to national grade- and subject-specific test score distributions. SEDA's data for school test scores pools data from 2009-2018 and is unavailable in earlier years. The students in our sample attended these schools in 1997, 2003, or 2007; we are forced to assume that relative school quality was similar in the decade before we observe testing data. 60 percent of our sample attends a school where we observe test scores in 2009-2019; 80 (50) percent of students attend a school where we observe the student-teacher ratio (percent FRPL) in the year in which we observe confidence. We also include an indicator for missing an NCES School ID in the CDS data.

F   Alternate definitions of childhood biased beliefs

This section describes the alternate definitions of over-confidence, under-confidence, and more continuous degrees of confidence to which we test robustness in Section 7 above. Throughout the following definitions, p refers to children's score percentiles in math and r refers to children's self-reported math ability from 1 to 7. The names referring to each definition match those used in the specification charts given in Appendix Figures A4-A16.

Section A. Over-confidence:

1. Main measure:

   - Over-confident if $\begin{cases} p < 25 & r \in \{6,7\} \\ p < 50 & r = 7 \end{cases}$

2. Main - more strict (1):

   - Over-confident if $\begin{cases} p < 15 & r \in \{6,7\} \\ p < 40 & r = 7 \end{cases}$

3. Main - less strict (1):

   - Over-confident if $\begin{cases} p < 35 & r \in \{6,7\} \\ p < 60 & r = 7 \end{cases}$

4. Main - less strict (2):

   - Over-confident if $\begin{cases} p < 15 & r \in \{5,6,7\} \\ p < 40 & r \in \{6,7\} \end{cases}$

   - Estimated with under-confidence measure *Original - less strict*

5. Relative:

   - Over-confident if $p <$ the 25th percentile of people who report the same self-reported ability (r) in the same age bucket and if $r < 5$

6. Continuous tails (3 to 6):

   - Over-confident if *Main* degrees of confidence measure (Section C #1) ≥ 3

7. Main of averages:

   - Take average of first and second self-reported ability (r) and first and second percentile scores (p)

   - Apply cutoffs of *Main* measure (Section A #1) to these averages

8. Average of main:

   - Take the average of the first- and second-observed *Main* (Section A #1) over-confidence measures

Section B. Under-confidence

1. Main measure::

   - Under-confident if $\begin{cases} p > 75 & r \in \{1,2,3,4\} \\ p > 50 & r \in \{1,2,3\} \end{cases}$

2. Main - more strict (1):

   - Under-confident if $\begin{cases} p > 85 & r \in \{1,2,3,4\} \\ p > 60 & r \in \{1,2,3\} \end{cases}$

3. Main - more strict (2):

   - Under-confident if $\begin{cases} p > 85 & r \in \{1,2,3,4\} \\ p > 60 & r \in \{1,2,3\} \end{cases}$

   - Estimated with over-confidence measure *Original - more strict*

4. Main - less strict (1):

- Under-confident if $\begin{cases} p > 65 & r \in \{1,2,3,4\} \\ p > 40 & r \in \{1,2,3\} \end{cases}$

5. Relative:

   - Under-confident if $p >$ the 75th percentile of people who report the same self-reported ability (r) in the same age bucket and if $r > 3$

6. Continuous tails (-6 to -3):

   - Over-confident if *Main* degrees of confidence measure (Section C #1) $\leq$ -3

7. Main of averages:

   - Take average of first and second self-reported ability (r) and first and second percentile scores (p)

   - Apply cutoffs of *Main* measure (Section B #1) to these averages

8. Average of main:

   - Take the average of the first- and second-observed *Main* (Section B #1) under-confidence measures

Section C. Degrees of confidence

- Main measure:

  - Assume that kids with accurate beliefs would have reported $r^* = 1$ if $p \in \{1, 14\}$, $r^* = 2$ if $p \in \{15, 28\}$, ... $r^* = 7$ if $p \in \{86, 100\}$.

  - Confidence measure is self-reported ability ($r \in \{1, ..., 7\}$) minus what they would have reported if they had accurate beliefs ($r^* \in \{1, ..., 7\}$). This variable has range -6 to 6.

- Percentiles:

- Convert empirical distribution of self-reports (r) into percentiles from 0 to 100 (p_r)

- Degree of confidence = $p_r - p$, or percentile of self-reported ability minus actual score percentile in our sample

- Empirical distribution:

  - Assume that the empirical distribution of self-reported ability is correct, but kids may be wrong about their place in it. In other words, if the full sample had accurate beliefs, the bottom 4% of scorers in our sample would report $r^* = 1$, the next 2% would report $r^* = 2$, and the top 22% of scorers would report $r^* = 7$. These values come from the empirical distribution of r, graphed in Figure 1.

  - Degree of confidence = $r - r^*$, or self-reported ability minus what children would have reported if they had accurate beliefs by this measure. This variable has range -6 to 6.

- Main of averages:

  - Take average of first and second self-reported ability (r) and first and second percentile scores (p)

  - Apply the same rule as the *Main* measure (Section C #1) to these averages

- Averages of main:

  - Take the average of the first- and second-observed *Main* measures (Section C #1) of degrees of confidence.

- **To make the specification charts, we standardize all of these measures of degrees of confidence to have mean 0 and standard deviation 1 in our analysis sample so that they can be compared on the same scale.**