Accomplishment in Science, Technology, Engineering, and Mathematics (STEM) and Its Relation to STEM Educational Dose: A 25-Year Longitudinal Study

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Web Supplement

Table S1 includes representative types of educational acceleration currently available to students. Table S2 shows the STEM educational dose level of the three groups of talent search participants. Table S3 shows the STEM educational dose level of the graduate student cohort with males and females combined, and males and females separately. Table S4 shows descriptive statistics of low and high dose proportions by outcome variable and statistical analyses for each cohort for proportion differences and proportion ratios. Table S5 shows descriptive statistics of low and high dose proportions by outcome variable and combined cohort statistical analyses for each cohort for proportion differences and proportion ratios (groups weighted equally).

Table S1.

Types of Educational Acceleration

1. Early Admission to Kindergarten
2. Early Admission to First Grade
3. Grade-Skipping
4. Continuous Progress
5. Self-Paced Instruction
6. Subject-Matter Acceleration/Partial Acceleration
7. Combined Classes
8. Curriculum Compacting
9. Telescoping Curriculum
10. Mentoring
11. Extracurricular Programs
12. Correspondence Courses
13. Early Graduation
14. Concurrent/Dual Enrollment
15. Advanced Placement
16. Credit by Examination
17. Acceleration in College
18. Early Entrance into Middle School, High School, or College

Note. Taken from Southern and Jones (2004, p. 6). Southern, W. T., & Jones, E. D. (2004). Types of acceleration: Dimensions and issues. In N. Colangelo, S. Assouline, and M. Gross (Eds.) *A nation deceived: How schools hold back America's brightest students* (Vol II, pp. 5-12). Iowa City, IA: University of Iowa.

Table S2.

STEM Dose Level	1972-74 Talent Search (Cohort 1) Avg. Age 13 SAT-M: 568	1976-78 Talent Search (Cohort 2) Avg. Age 13 SAT-M: 571	1980-83 Talent Search (Cohort 3) Avg. Age 13 SAT-M: 729
0	130	47	0
1	305 (median)	54	12
2	223	95	19
3	97	103 (median)	32
4	21	93	19
5	0	57	33 (median)
6	0	14	46
7	0	4	39
8	0	0	18
9	0	0	3
10	0	0	3

Note. This table includes the 1972-74 talent search (Cohort 1; SAT-M $\geq$ 500), 1976-78 talent search (Cohort 2; SAT-M $\geq$ 500), and 1980-83 talent search (Cohort 3; SAT-M $\geq$ 700) participants with 20-year follow-up data.

Table S3.

STEM Dose Level	Graduate Student Males + Females	Graduate Student Males	Graduate Student Females
0	150	80	70
1	75	47	28
2	181 (median)	82 (median)	99 (median)
3	187	93	94
4	98	52	46
5	23	14	9

Note. The components for the graduate students were college courses while in high school, AP or other courses for college credit, science fair/math competitions, special classes, and research.

Table S4.

	Low Dose	High Dose	95% CI Proportion Differences	Gain Ratio	95 % CI Gain Ratio
STEM PhD					
Cohort 1	1.6%	3.5%	(−0.004, 0.042)	2.186	(0.870, 5.493)
Cohort 2	5.1%	14.8%	(0.044, 0.149)	2.894	(1.484, 5.645)
Cohort 3	25.2%	28.4%	(−0.083, 0.148)	1.128	(0.731, 1.738)
STEM Publication					
Cohort 1	1.6%	3.5%	(−0.004, 0.042)	2.186	(0.870, 5.493)
Cohort 2	4.1%	10.7%	(0.020, 0.112)	2.623	(1.225, 5.612)
Cohort 3	11.3%	19.3%	(−0.014, 0.174)	1.705	(0.899, 3.234)
STEM Tenure					
Cohort 1	0.2%	1.8%	(0.001, 0.030)	7.652	(0.926, 63.225)
Cohort 2	0.5%	3.3%	(0.005, 0.052)	6.510	(0.831, 50.989)
Cohort 3	7.8%	8.3%	(−0.067, 0.076)	1.056	(0.435, 2.562)
STEM Patent					
Cohort 1	3.7%	3.2%	(−0.032, 0.021)	0.877	(0.412, 1.867)
Cohort 2	8.7%	14.4%	(−0.001, 0.115)	1.660	(0.968, 2.845)
Cohort 3	20.9%	19.3%	(−0.120, 0.088)	0.923	(0.547, 1.558)
STEM Occupation					
Cohort 1	22.3%	27.6%	(−0.009, 0.114)	1.236	(0.967, 1.581)
Cohort 2	31.6%	37.6%	(−0.027, 0.147)	1.190	(0.921, 1.537)
Cohort 3	28.7%	32.1%	(−0.085, 0.153)	1.119	(0.753, 1.664)
At Least One					
Cohort 1	23.9%	31.7%	(0.014, 0.141)	1.325	(1.054, 1.665)
Cohort 2	37.8%	45.4%	(−0.014, 0.166)	1.202	(0.963, 1.501)
Cohort 3	44.4%	49.5%	(−0.079, 0.182)	1.117	(0.845, 1.476)

Table S5.

	Low Dose	High Dose	95% CI Proportion Differences	Gain Ratio	95 % CI Gain Ratio
Cohorts Combined (weighted equally)					
STEM PhD	10.6%	15.6%	(0.006, 0.092)	1.463	(1.119, 1.913)
STEM Publication	5.7%	11.2%	(0.019, 0.091)	1.972	(1.379, 2.820)
STEM Tenure	2.9%	4.4%	(−0.010, 0.041)	1.558	(0.909, 2.820)
STEM Patent	11.1%	12.3%	(−0.029, 0.053)	1.110	(0.838, 1.471)
STEM Occupation	27.5%	32.4%	(−0.005, 0.103)	1.178	(1.007, 1.377)
At Least One	35.3%	42.2%	(0.019, 0.118)	1.194	(1.049, 1.359)