**Supplemental Content 1.** Cross-sectional associations of student school-day MVPA and academic achievement, mediated by physical fitness, female students (*n*=2,466).

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| **Predictor, mediator** | **Academic outcome** | **Total effect** | ***a*** | ***b*** | **Indirect effect** | **95% CI of indirect effect** |
| **Grade 4 fall MVPA, BMI** | **Grade 4 fall course grades** |  |  |  |  |  |
|  | Math | -0.049 (0.023) | -0.018 (0.012) | -0.054 (0.041) | 0.001 | -0.003, 0.007 |
|  | Reading | -0.054 (0.019) | -0.018 (0.012) | -0.034 (0.034) | 0.001 | -0.003, 0.005 |
|  | Writing | -0.037 (0.018) | -0.018 (0.012) | -0.068 (0.033) | 0.001 | -0.002, 0.007 |
|  | Spelling | -0.057 (0.024) | -0.018 (0.012) | -0.041 (0.043) | 0.001 | -0.003, 0.006 |
| **Grade 4 spring MVPA, BMI** | **Grade 4 spring course grades** |  |  |  |  |  |
|  | Math | -0.044 (0.022) | -0.035 (0.013) | -0.046 (0.036) | 0.002 | -0.003, 0.009 |
|  | Reading | -0.034 (0.020) | -0.036 (0.013) | -0.050 (0.033) | 0.002 | -0.003, 0.009 |
|  | Writing | -0.030 (0.019) | -0.036 (0.013) | -0.045 (0.032) | 0.002 | -0.003, 0.009 |
|  | Spelling | -0.038 (0.022) | -0.036 (0.013) | -0.050 (0.038) | 0.002 | -0.004, 0.0098 |
| **Grade 4 MVPA, BMI** | **Grade 4 standardized test scores** |  |  |  |  |  |
|  | Math | -0.338 (0.100) | -0.039 (0.015) | -0.140 (0.141) | 0.005 | -0.020, 0.039 |
|  | English language arts | -0.286 (0.116) | -0.038 (0.015) | -0.163 (0.167) | 0.006 | -0.021, 0.041 |
|  | Lexile | -1.105 (0.518) | -0.038 (0.015) | -0.332 (0.750) | 0.013 | -0.115, 0.156 |
| **Grade 5 fall MVPA, BMI** | **Grade 5 fall course grades** |  |  |  |  |  |
|  | Math | 0.020 (0.026) | -0.006 (0.016) | -0.097 (0.036) | 0.001 | -0.007, 0.009 |
|  | Reading | -0.010 (0.020) | -0.005 (0.016) | -0.081 (0.028) | 0.000 | -0.006, 0.007 |
|  | Writing | -0.054 (0.019) | -0.005 (0.016) | -0.099 (0.027) | 0.001 | -0.006, 0.008 |
|  | Spelling | 0.002 (0.025) | -0.006 (0.016) | -0.091 (0.034) | 0.001 | -0.007, 0.008 |
| **Grade 4 fall MVPA, CRF** | **Grade 4 fall course grades** |  |  |  |  |  |
|  | Math |  | 0.054 (0.012) | 0.174 (0.046) | **0.009** | 0.001, 0.023 |
|  | Reading |  | 0.053 (0.012) | 0.117 (0.037) | **0.006** | 0.000, 0.016 |
|  | Writing |  | 0.052 (0.012) | 0.138 (0.038) | **0.007** | 0.000, 0.018 |
|  | Spelling |  | 0.052 (0.012) | 0.125 (0.049) | 0.006 | -0.003, 0.020 |
| **Grade 4 spring MVPA, CRF** | **Grade 4 spring course grades** |  |  |  |  |  |
|  | Math |  | 0.067 (0.012) | 0.124 (0.124) | 0.008 | -0.002, 0.022 |
|  | Reading |  | 0.064 (0.012) | 0.071 (0.071) | 0.005 | -0.004, 0.017 |
|  | Writing |  | 0.063 (0.012) | 0.117 (0.117) | **0.007** | 0.000, 0.019 |
|  | Spelling |  | 0.063 (0.012) | 0.111 (0.111) | 0.007 | -0.004, 0.023 |
| **Grade 4 MVPA, CRF** | **Grade 4 standardized test scores** |  |  |  |  |  |
|  | Math |  | 0.080 (0.012) | 0.420 (0.176) | 0.033 | -0.018, 0.095 |
|  | English language arts |  | 0.077 (0.013) | 0.701 (0.200) | 0.054 | -0.005, 0.132 |
|  | Lexile |  | 0.076 (0.013) | 2.176 (0.897) | 0.165 | -0.073, 0.487 |
| **Grade 5 fall MVPA, CRF** | **Grade 5 fall course grades** |  |  |  |  |  |
|  | Math |  | 0.071 (0.014) | 0.157 (0.042) | **0.011** | 0.001, 0.028 |
|  | Reading |  | 0.070 (0.014) | 0.115 (0.033) | 0.008 | -0.001, 0.020 |
|  | Writing |  | 0.070 (0.013) | 0.088 (0.032) | 0.006 | -0.002, 0.017 |
|  | Spelling |  | 0.070 (0.013) | 0.107 (0.040) | 0.007 | -0.002, 0.021 |

Models adjusted for student sex, race/ethnicity, free/reduced-price lunch (FRL) status, English language learner status, student with disabilities status, grade 3 absences, grade 3 tardies, special education course enrollment, school percentage female, school percentage Black, school percentage Hispanic, school percentage FRL, school cohort (intervention or control), departmentalization, and prior achievement for the specific academic outcome (e.g., when assessing math grade as outcome, used grade 3 average math grade). The 95% confidence interval (CI) for the indirect effect was found using the Monte Carlo method. In bold are the indirect effects found to be statistically significant using a Bonferroni corrected alpha of 0.00038. The *a* path is from a model in which the focal predictor is predicting the mediator and the *b* path is from a model in which the mediator is predicting the outcome. BMI, body mass index; CRF, cardiorespiratory fitness; MVPA, moderate-to-vigorous physical activity.