

Latent-Score Mediation SEM

Standalone verified Python analysis

Test: Latent-Score Mediation SEM

Design: Measurement-informed engagement, behavior, and academic scores linked in a mediation structure.

Variables: G1, G2, G3, famrel, freetime, goout, studytime, health, Dalc, Walc, failures

Null hypothesis: Engagement has neither direct nor indirect association with academic achievement.

Formula: Behavior=a Engagement+u; Academic=b Behavior+c' Engagement+e; indirect=a*b.

Source rows: 649

Calculated metrics:

engagement_to_behavior: 0.16857009200456385

behavior_to_academic: 0.4925065042856399

direct_effect: 0.16010130763925542

indirect_effect: 0.08302186674027644

total_effect: 0.24312317437953185

academic_r_squared: 0.14220793441771185

Independent reference values:

engagement_to_behavior: 0.16857009200456385

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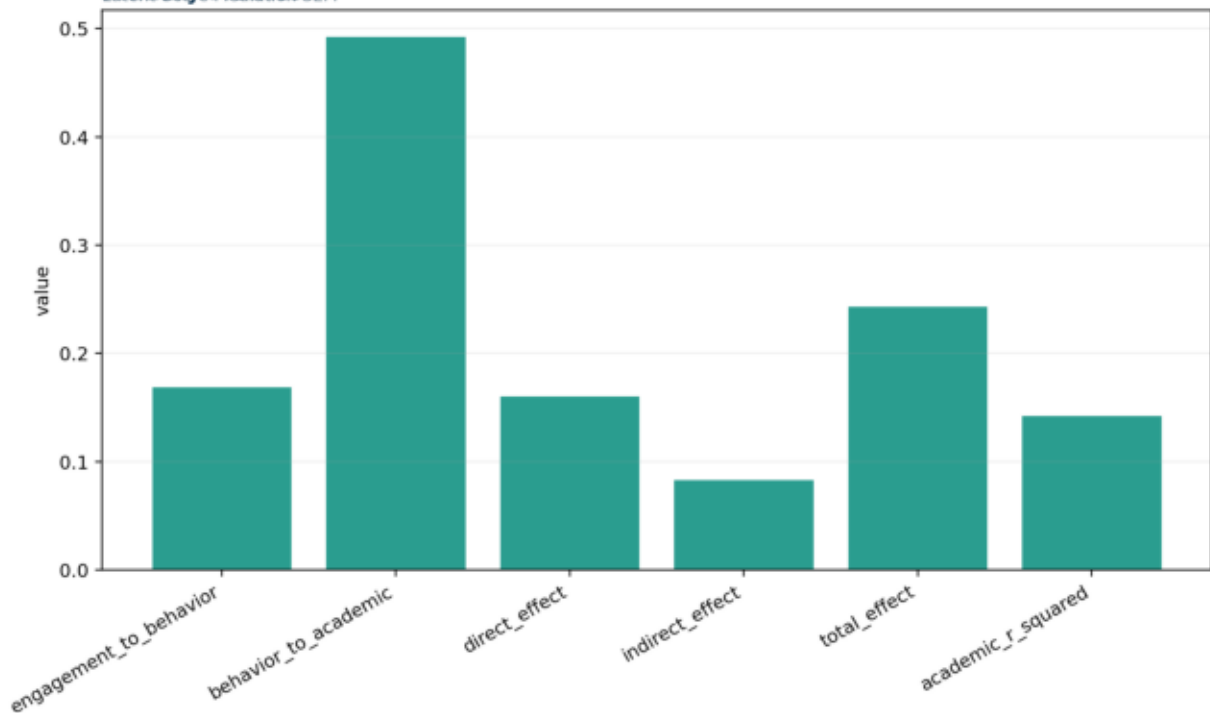
Interpretation:

The SEM separates direct, indirect, and total mediation effects.

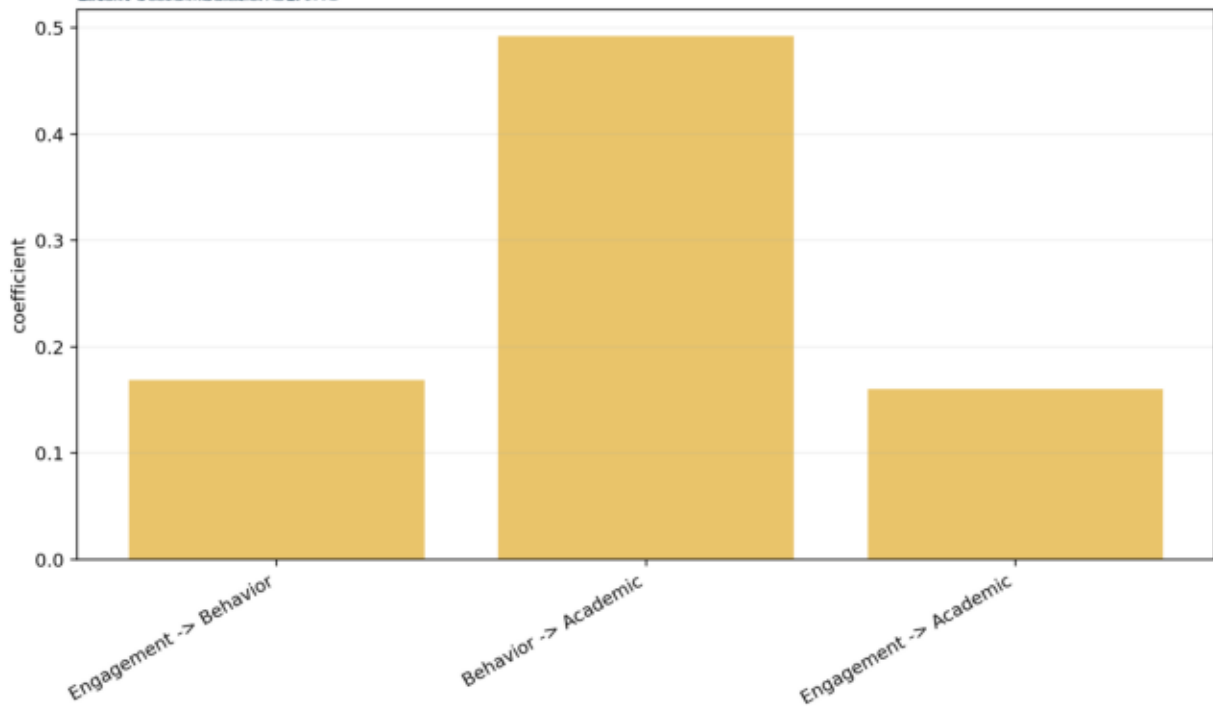
Indirect effect=0.083022.

Primary Metrics

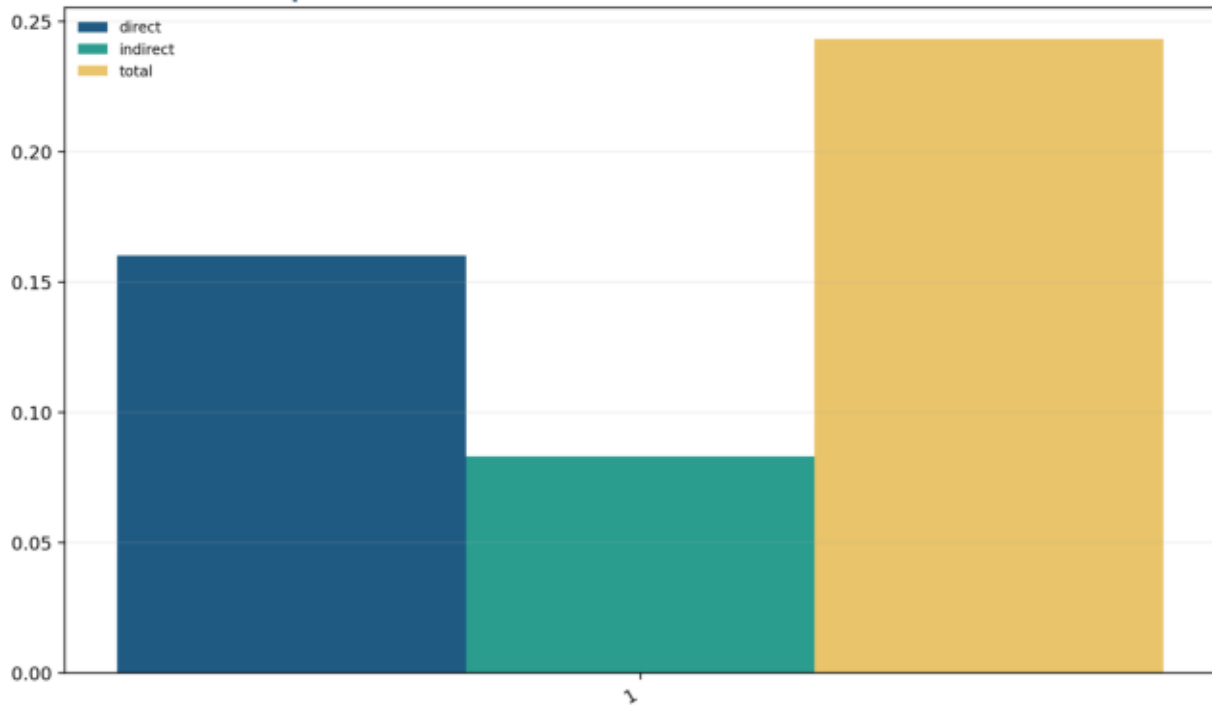
Model: Path Analysis SEM



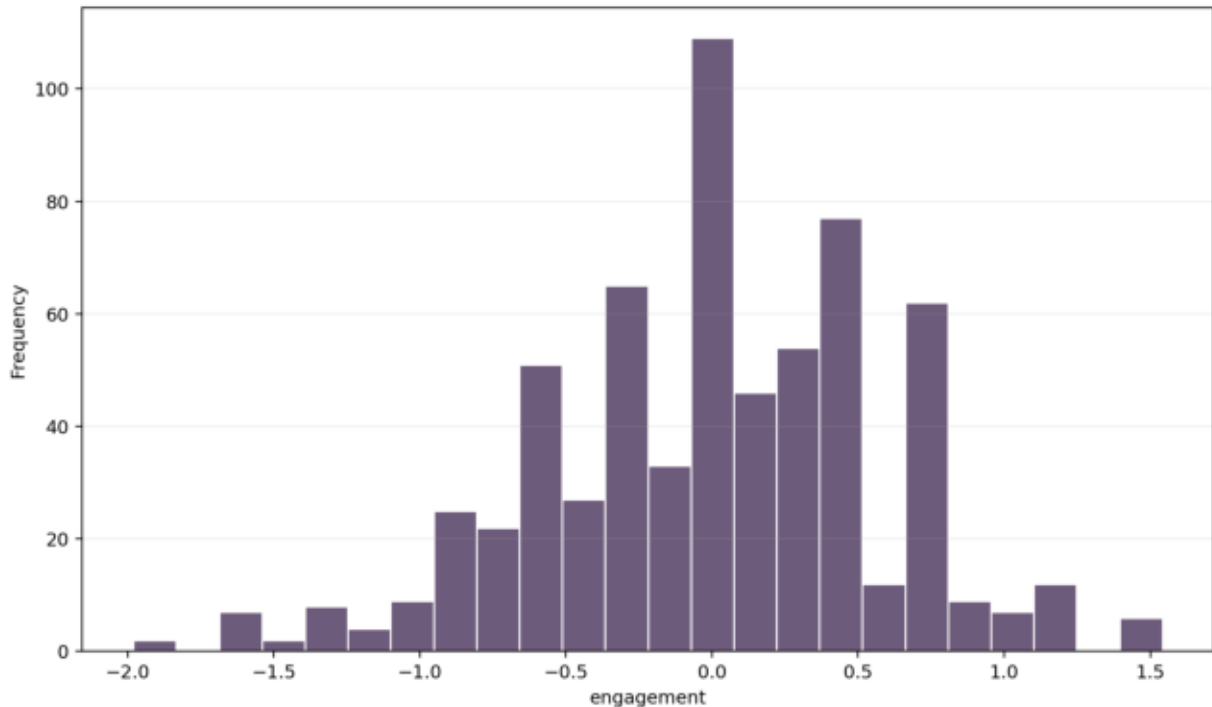
Sem-Mediation Paths



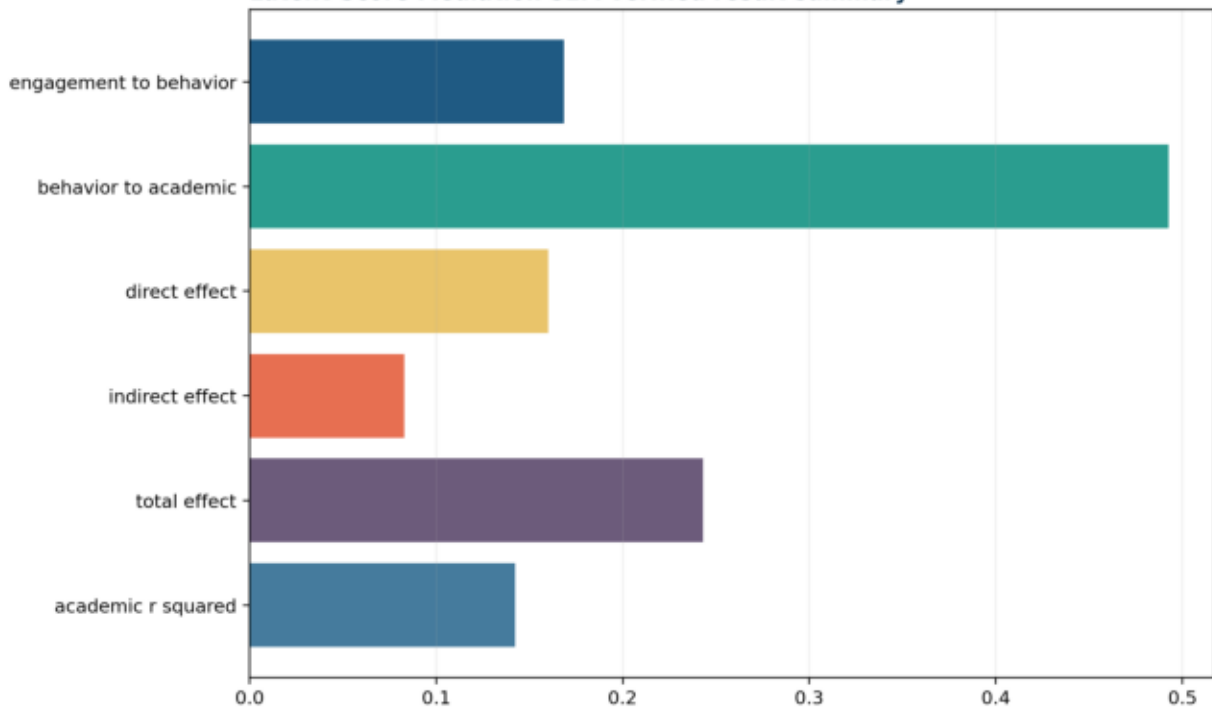
Sem-Effect Decomposition



Sem Construct Scores



Latent-Score Mediation SEM verified result summary



Primary Metrics

metric	value
engagement_to_behavior	0.16857
behavior_to_academic	0.492507
direct_effect	0.160101
indirect_effect	0.0830219
total_effect	0.243123
academic_r_squared	0.142208

Sem Mediation Paths

path	coefficient
Engagement -> Behavior	0.16857
Behavior -> Academic	0.492507
Engagement -> Academic	0.160101

Sem Effect Decomposition

direct	indirect	total
0.160101	0.0830219	0.243123

Sem Construct Scores

engagement	behavior	academic
-0.0715392	0.638026	-1.58802
0.277239	0.638026	-0.466377
-0.0715392	-0.241456	0.259033
0.442486	0.638026	0.846341
0.38942	0.378498	0.242599
0.738199	0.378498	0.245557
-0.0715392	0.638026	0.370184
-0.532499	0.638026	0.117972
-0.532499	0.638026	1.53888
0.738199	0.638026	0.245557
-0.650797	0.378498	0.846341
0.909563	0.638026	-0.00369699
-0.0124237	0.118969	0.259033
0.277239	0.378498	0.245557
0.330305	0.638026	0.954533
-0.703863	0.378498	1.9098
-0.248953	0.378498	0.600045
0.507719	0.638026	0.721714
0.336355	-2.18666	-1.38878
-0.361202	0.118969	0.137365
-0.532499	0.638026	0.475418
0.336355	0.638026	0.0127378
0.38942	0.118969	0.475418
0.738199	-0.500984	-0.571611
0.791264	0.638026	-0.449942
-1.05876	0.118969	-0.233558