

SEM Structural Model

Standalone verified Python analysis

Test: SEM Structural Model

Design: Predictive paths to the academic construct score after the measurement model is fixed.

Variables: Academic score, Social score, studytime, failures

Null hypothesis: All structural slopes are zero and academic R-squared is zero.

Formula: $\text{Academic} = \beta_0 + \beta_1 \text{Social} + \beta_2 \text{Studytime} + \beta_3 \text{Failures} + \text{zeta}$.

Source rows: 649

Calculated metrics:

social_path: -0.047089820120738896

studytime_path: 0.2030470703509362

failures_path: -0.3725739993744453

social_p_value: 0.18148189995599537

academic_r_squared: 0.20849058206409432

residual_variance: 0.7915094179359057

Independent reference values:

social_path: -0.047089820120738896

studytime_path: 0.2030470703509362

failures_path: -0.3725739993744453

social_p_value: 0.18148189995599537

academic_r_squared: 0.20849058206409432

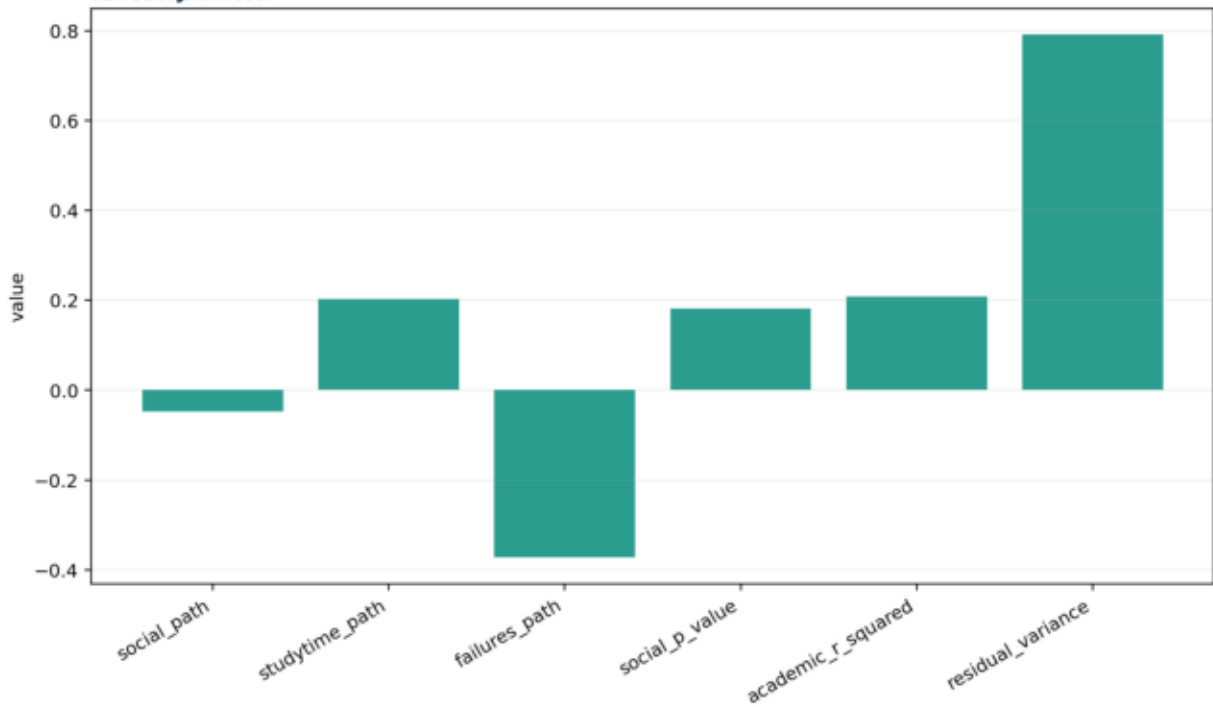
residual_variance: 0.7915094179359057

Interpretation:

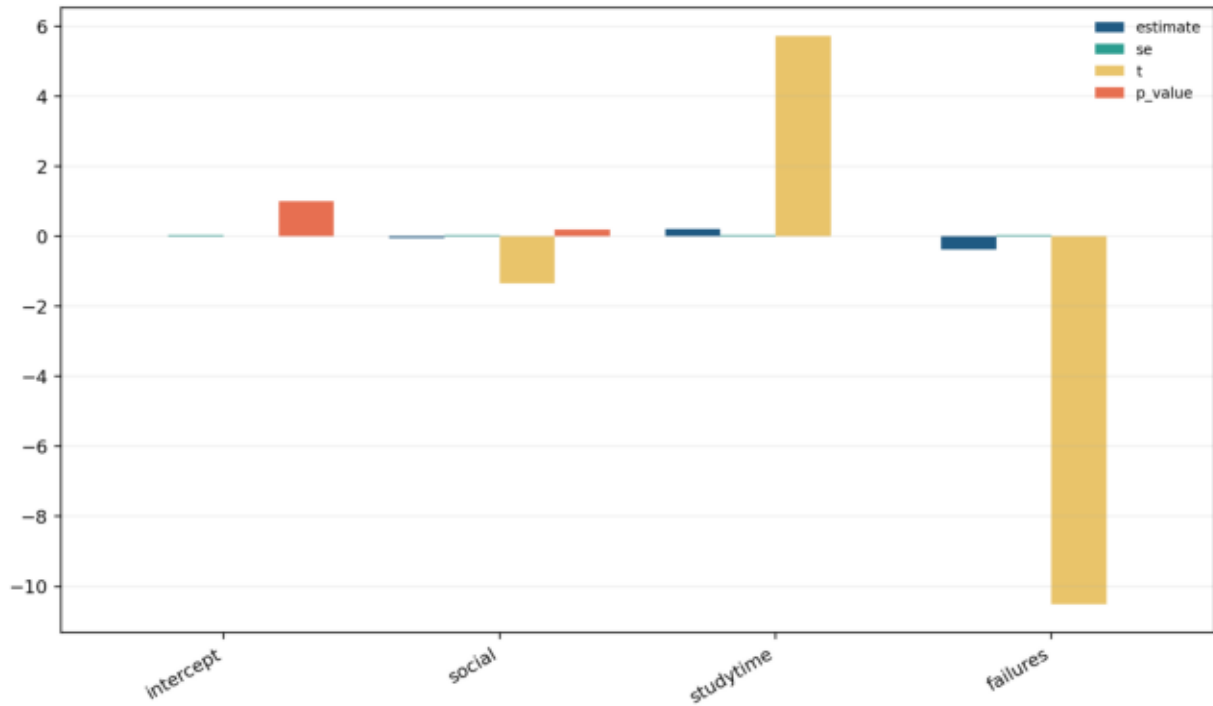
This folder isolates predictive structural paths after fixing construct scores.

Academic structural R-squared=0.208491.

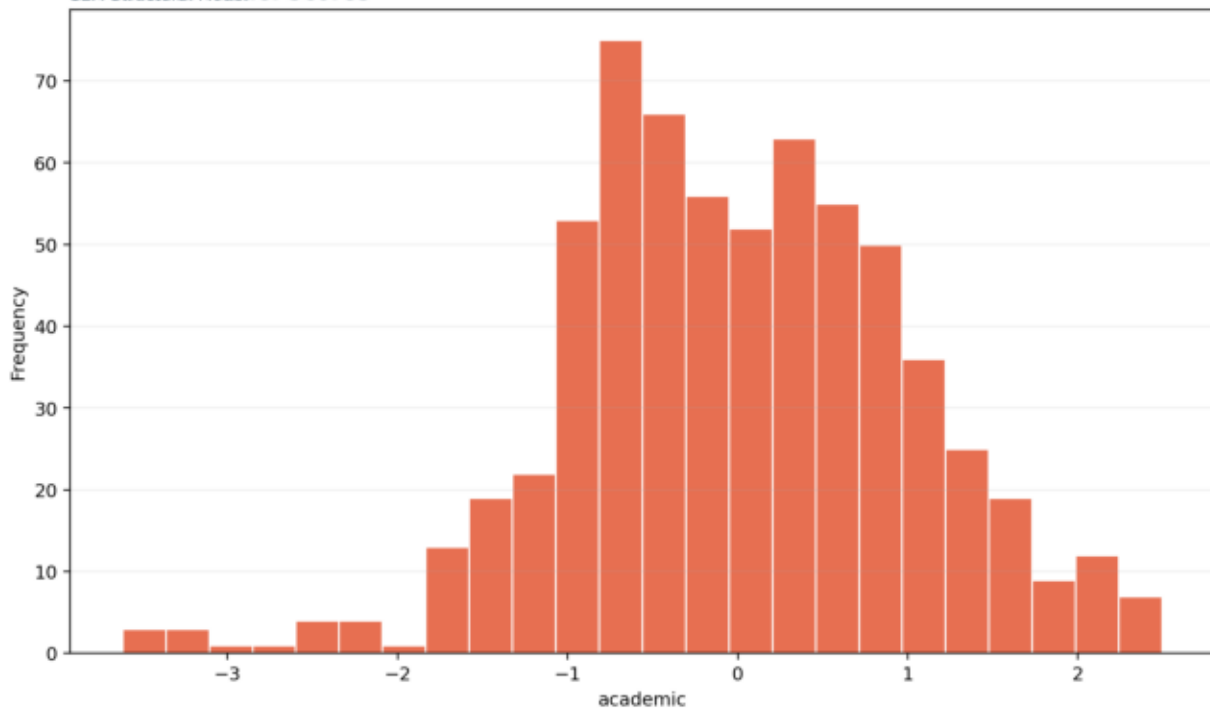
Primary Metrics



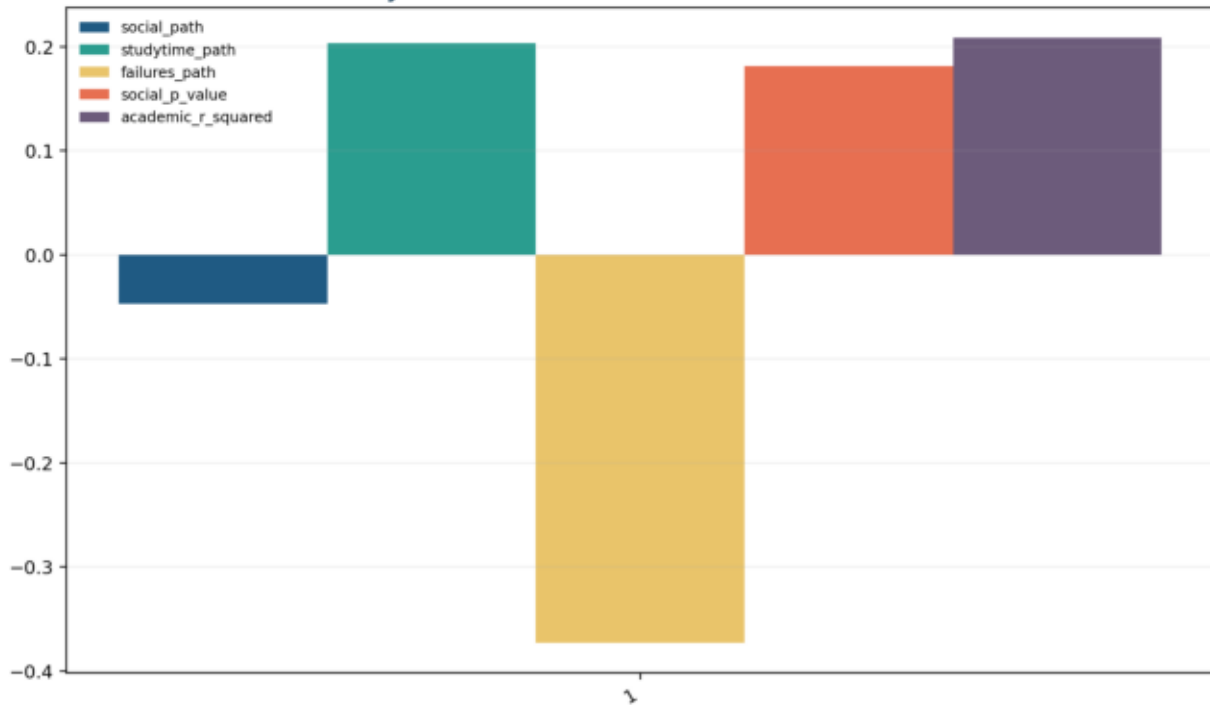
Structural Model Coefficients



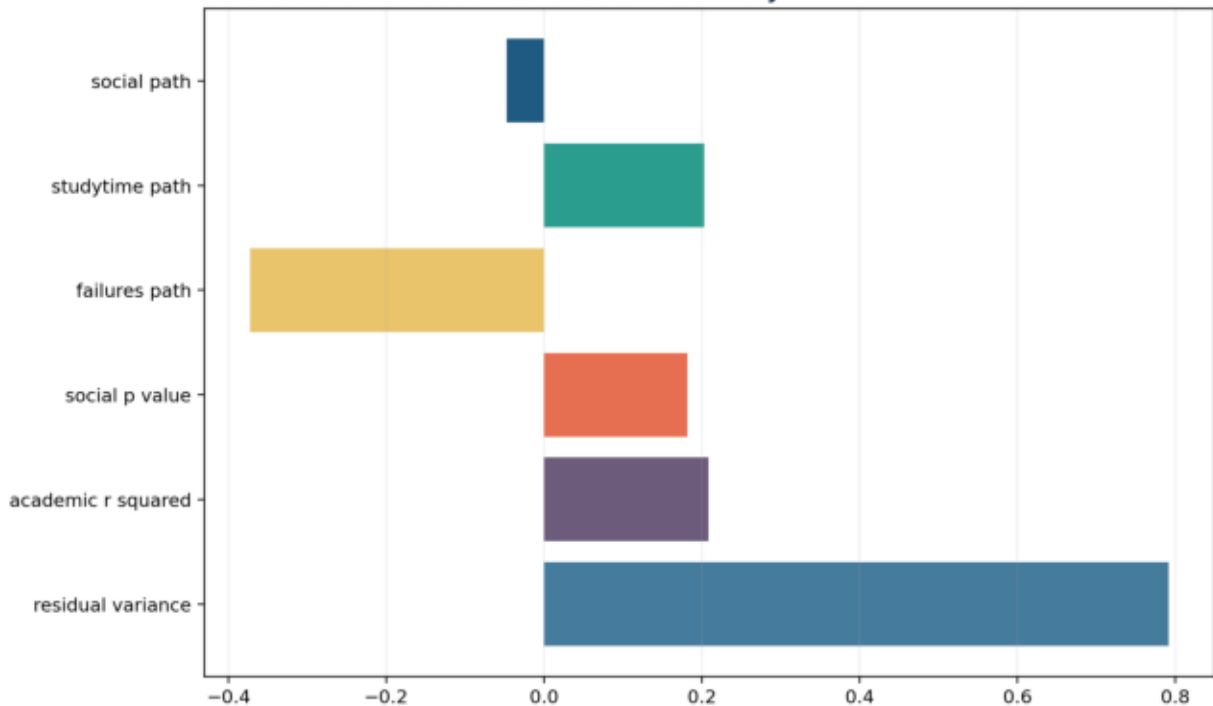
Structural Model Scores



Structural Model Summary



SEM Structural Model verified result summary



Primary Metrics

metric	value
social_path	-0.0470898
studytime_path	0.203047
failures_path	-0.372574
social_p_value	0.181482
academic_r_squared	0.208491
residual_variance	0.791509

Structural Model Coefficients

term	estimate	se	t	p_value
intercept	0	0.0350037	0	1
social	-0.0470898	0.0352034	-1.33765	0.181482
studytime	0.203047	0.0355113	5.71781	1.65087e-08
failures	-0.372574	0.0354738	-10.5028	6.29231e-24

Structural Model Scores

academic	social	studytime	failures	fitted	residual
-1.58802	0.30562	0.0835885	-0.374017	0.14193	-1.72995
-0.466377	0.154013	0.0835885	-0.374017	0.149069	-0.615446
0.259033	-0.628356	0.0835885	-0.374017	0.18591	0.073123
0.846341	-1.48118	1.28912	-0.374017	0.47085	0.375491
0.242599	-0.628356	0.0835885	-0.374017	0.18591	0.0566882
0.245557	0.224471	0.0835885	-0.374017	0.145751	0.0998063
0.370184	0.843067	0.0835885	-0.374017	0.116621	0.253563
0.117972	-0.769273	0.0835885	-0.374017	0.192546	-0.0745747
1.53888	-1.1658	0.0835885	-0.374017	0.211219	1.32766
0.245557	0.29493	0.0835885	-0.374017	0.142433	0.103124
0.846341	-0.476749	0.0835885	-0.374017	0.178771	0.667569
-0.00369699	-0.850422	1.28912	-0.374017	0.441147	-0.444844
0.259033	-0.161368	-1.12194	-0.374017	-0.0808596	0.339893
0.245557	0.69146	0.0835885	-0.374017	0.123761	0.121797
0.954533	0.446537	1.28912	-0.374017	0.380074	0.574459
1.9098	0.843067	-1.12194	-0.374017	-0.128158	2.03796
0.600045	-1.0142	1.28912	-0.374017	0.448859	0.151186
0.721714	-0.312975	0.0835885	-0.374017	0.171059	0.550654
-1.38878	2.16288	-1.12194	4.683	-2.07442	0.685642
0.137365	-1.55164	-1.12194	-0.374017	-0.0153918	0.152757
0.475418	-0.557898	0.0835885	-0.374017	0.182593	0.292825
0.0127378	0.224471	-1.12194	-0.374017	-0.0990287	0.111766
0.475418	-0.020451	0.0835885	-0.374017	0.157284	0.318134
-0.571611	1.15845	0.0835885	-0.374017	0.10177	-0.673381
-0.449942	-0.628356	1.28912	-0.374017	0.43069	-0.880633
-0.233558	-2.11194	-1.12194	-0.374017	0.0109927	-0.244551

Structural Model Summary

social_path	studytime_path	failures_path	social_p_value	academic_r_squared	residual_variance
-0.0470898	0.203047	-0.372574	0.181482	0.208491	0.791509