

Moderated Mediation

Test name: Moderated Mediation

Dataset: D:\DATA ANALYSIS\H Regression Tests and Models\Moderated Mediation\dataset.csv

Rows in original dataset: 649

Columns in original dataset: 33

Rows used in moderated mediation model: 649

Outcome Y: G3

Predictor X: G1

Mediator M: G2

Moderator W: studytime

Covariates: failures, absences, age, Medu, Fedu

Mediator model: $M \sim X + \text{covariates}$.

Outcome model: $Y \sim X + M + W + M \times W + \text{covariates}$.

Conditional indirect effect: $a * (b_M + b_{MW} * W_{\text{centered}})$.

Bootstrap samples requested: 1000

Bootstrap samples completed: 1000

Index of moderated mediation: -0.0390

Index bootstrap 95% CI: [-0.0750, -0.0065]

Index decision: Moderated mediation supported

Outcome model R-squared: 0.8518

Charts generated: 8

Mediator model coefficients

model	term	coefficient	standard_error	t_value	p_value	ci95_lower	ci95_upper	decision_alpha_0.05
Mediator model:	const	11.5701	0.0566	204.3794	0.0000	11.4589	11.6813	Statistically significant
Mediator model:	X_c	0.8860	0.0231	38.3968	0.0000	0.8407	0.9313	Statistically significant
Mediator model:	cov_failures	-0.3868	0.1081	-3.5781	0.0004	-0.5991	-0.1745	Statistically significant
Mediator model:	cov_absences	-0.0020	0.0125	-0.1561	0.8760	-0.0265	0.0226	Not statistically significant
Mediator model:	cov_age	0.1664	0.0496	3.3533	0.0008	0.0689	0.2638	Statistically significant
Mediator model:	cov_Medu	0.0674	0.0664	1.0150	0.3105	-0.0630	0.1979	Not statistically significant
Mediator model:	cov_Fedu	0.0583	0.0681	0.8573	0.3916	-0.0753	0.1920	Not statistically significant

Outcome model coefficients

model	term	coefficient	standard_error	t_value	p_value	ci95_lower	ci95_upper	decision_alpha_0.05
Outcome model:	const	11.9316	0.0507	235.5015	0.0000	11.8321	12.0311	Statistically significant
Outcome model:	X_c	0.1473	0.0366	4.0209	0.0001	0.0753	0.2192	Statistically significant
Outcome model:	M_c	0.8840	0.0343	25.7854	0.0000	0.8167	0.9513	Statistically significant
Outcome model:	W_c	0.1084	0.0622	1.7428	0.0819	-0.0137	0.2305	Not statistically significant
Outcome model:	MW_interaction	-0.0441	0.0211	-2.0897	0.0370	-0.0855	-0.0027	Statistically significant
Outcome model:	cov_failures	-0.2230	0.0952	-2.3433	0.0194	-0.4099	-0.0361	Statistically significant
Outcome model:	cov_absences	0.0215	0.0109	1.9757	0.0486	0.0001	0.0430	Statistically significant
Outcome model:	cov_age	0.0312	0.0437	0.7133	0.4759	-0.0547	0.1171	Not statistically significant
Outcome model:	cov_Medu	-0.0418	0.0578	-0.7223	0.4704	-0.1553	0.0718	Not statistically significant
Outcome model:	cov_Fedu	0.0098	0.0594	0.1655	0.8686	-0.1069	0.1266	Not statistically significant

Conditional indirect effects

moderator_level	W_centered_value	W_original_value	a_path_X_to_M	conditional_b_path	direct_effect_c_path	total_effect_c_path	conditional_indirect_effect	index_of_moderation
Low moderator (-1 SD)	-0.8295	1.1012	0.8860	0.9205	0.1473	0.9339	0.8156	-0.0390
Mean moderator	0.0000	1.9307	0.8860	0.8840	0.1473	0.9339	0.7832	-0.0390
High moderator (+1 SD)	0.8295	2.7602	0.8860	0.8474	0.1473	0.9339	0.7508	-0.0390

Bootstrap summary

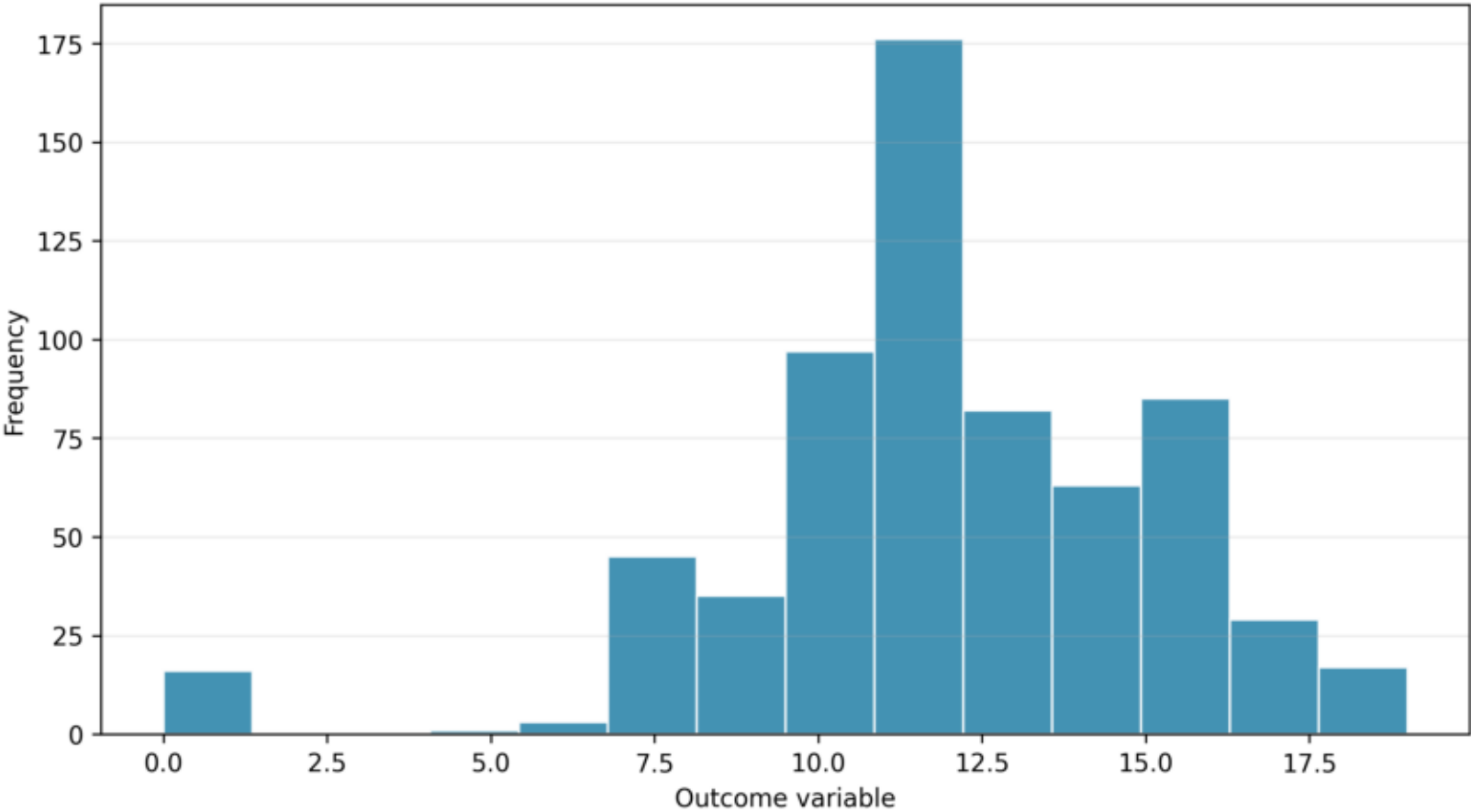
effect	point_estimate	bootstrap_mean	bootstrap_se	ci95_lower_percentile	ci95_upper_percentile	decision
Low moderator (-1 SD)	0.8156	0.8154	0.0500	0.7149	0.9121	Evidence of conditional i
Mean moderator	0.7832	0.7830	0.0466	0.6899	0.8703	Evidence of conditional i
High moderator (+1 SD)	0.7508	0.7506	0.0476	0.6600	0.8434	Evidence of conditional i
Index of moderated m	-0.0390	-0.0391	0.0175	-0.0750	-0.0065	Moderated mediation su

Model fit statistics

model	n	df_model	df_resid	r_squared	adjusted_r_sq	f_statistic	f_p_value	aic	bic	rmse
Mediator model	649.0000	6.0000	642.0000	0.7573	0.7550	333.8084	0.0000	2324.0239	2355.3520	1.4344
Outcome model	649.0000	9.0000	639.0000	0.8518	0.8497	408.0503	0.0000	2143.9044	2188.6587	1.2428
Total effect model	649.0000	6.0000	642.0000	0.6953	0.6925	244.2108	0.0000	2605.5529	2636.8809	1.7818

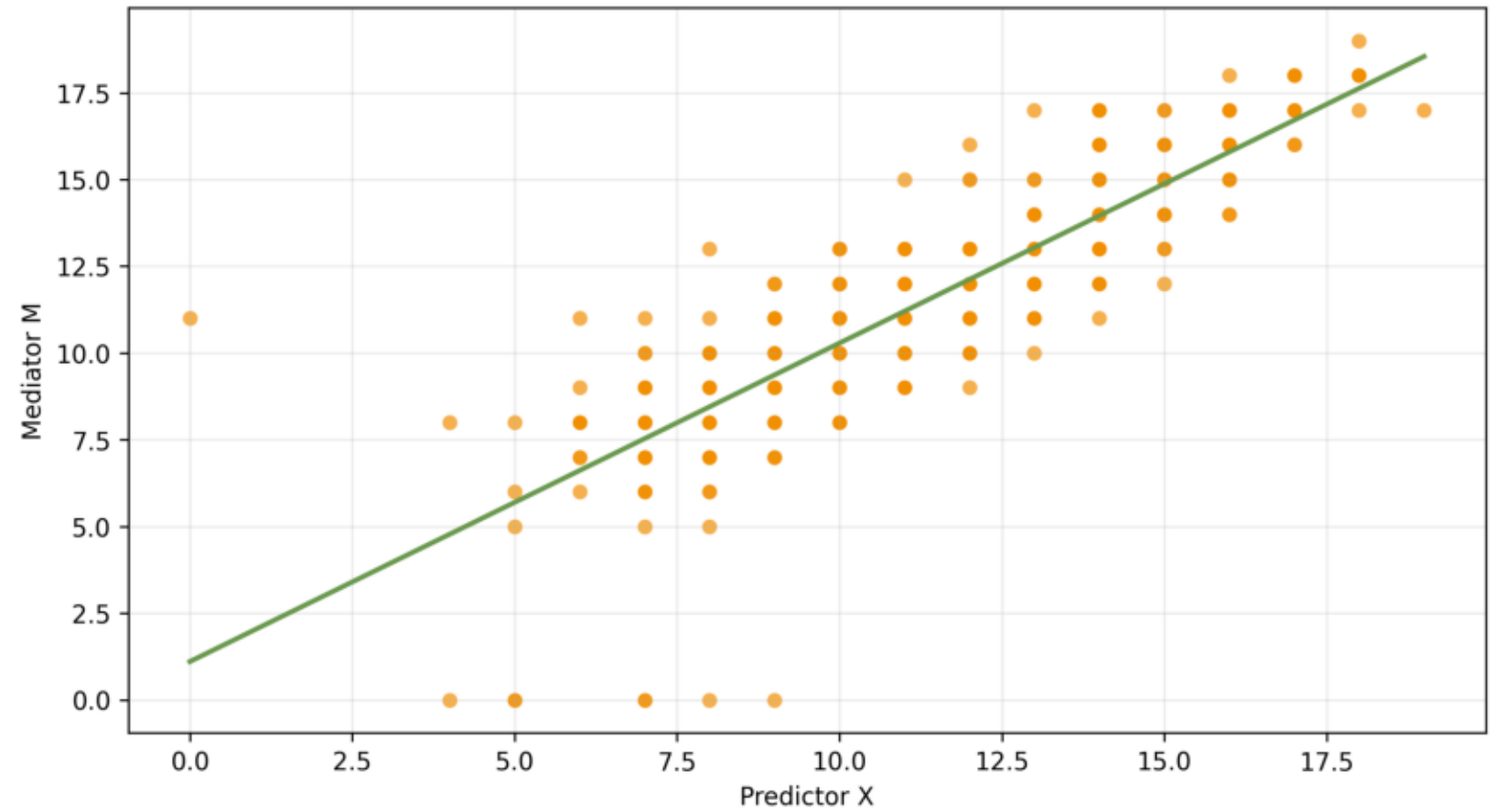
Outcome distribution for moderated mediation

The dependent variable is inspected before estimating direct, indirect, and conditional effects.



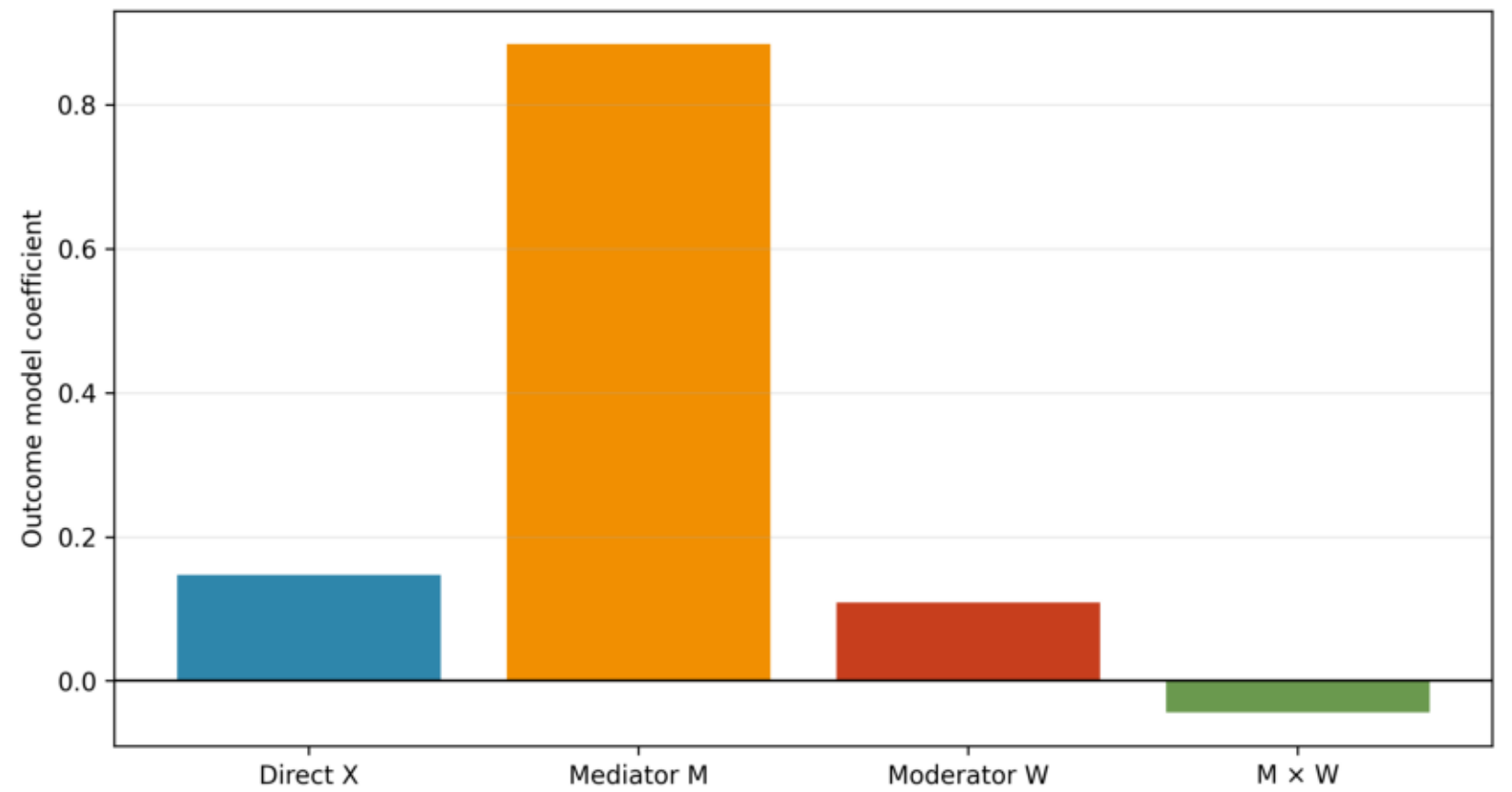
Mediator path: X to M

This chart visualizes the a path used in the moderated mediation indirect effect.



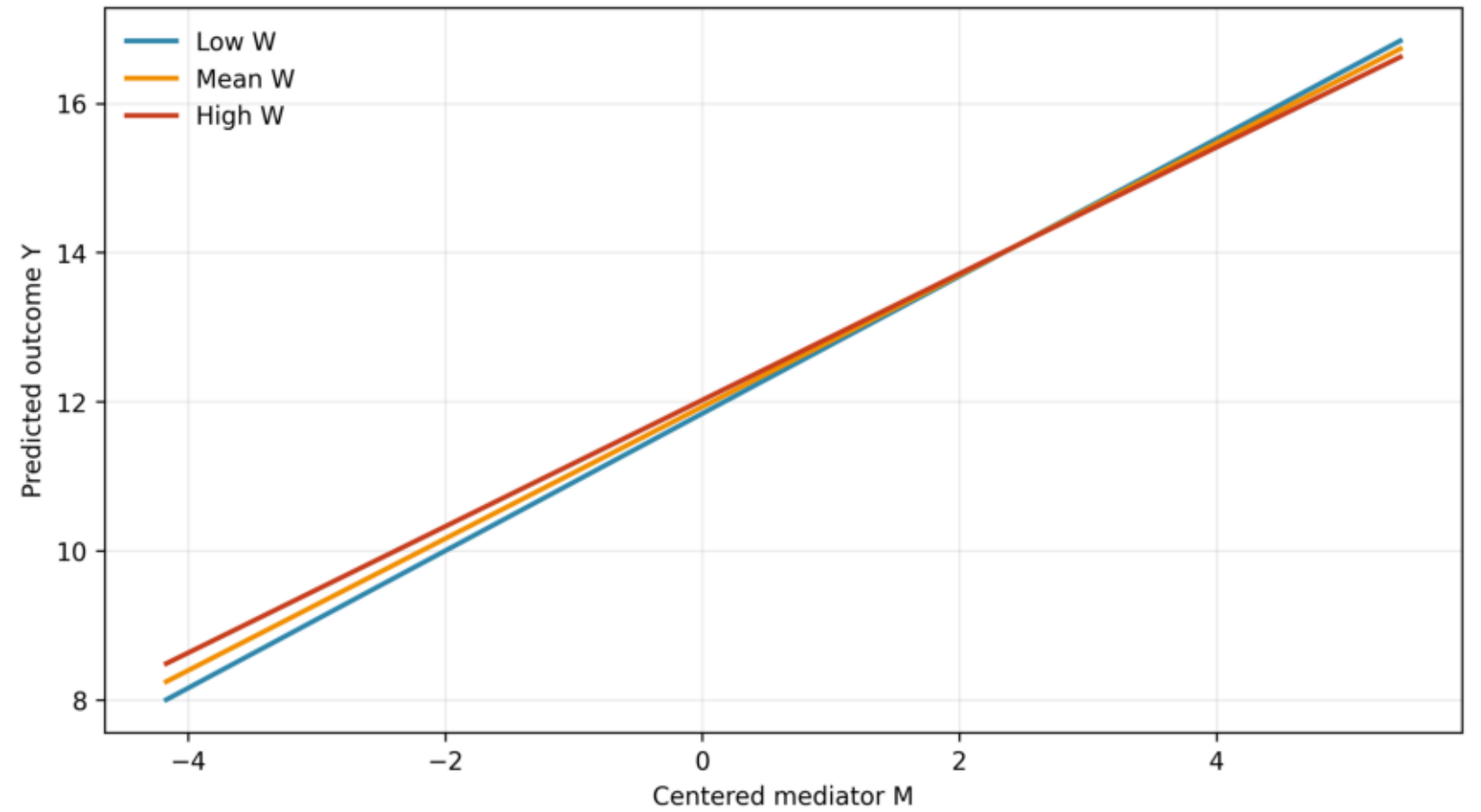
Outcome-model path coefficients

The interaction term tests whether the mediator effect changes across moderator levels.



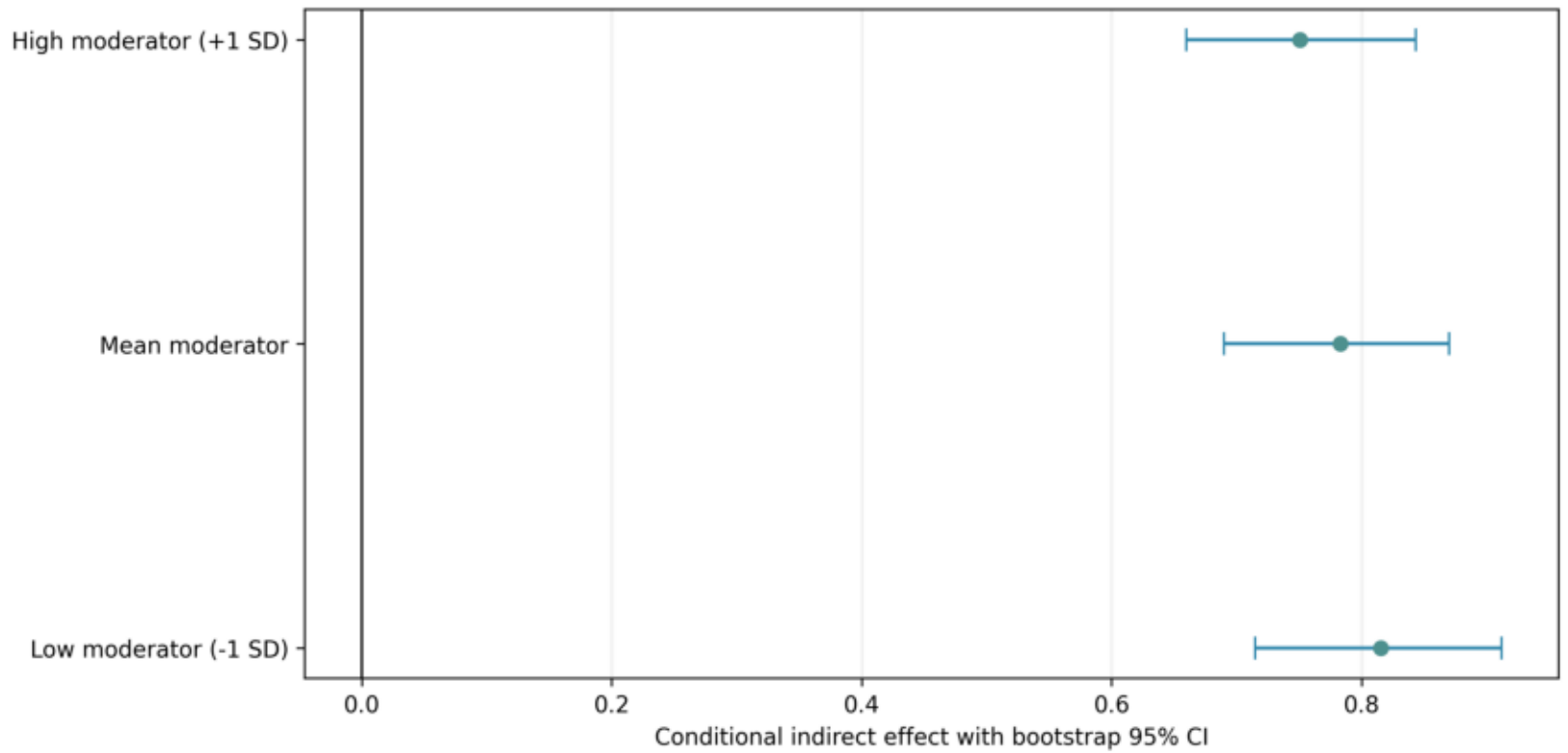
Moderation of the mediator-to-outcome path

Separate lines show how the M to Y path changes at low, mean, and high moderator values.



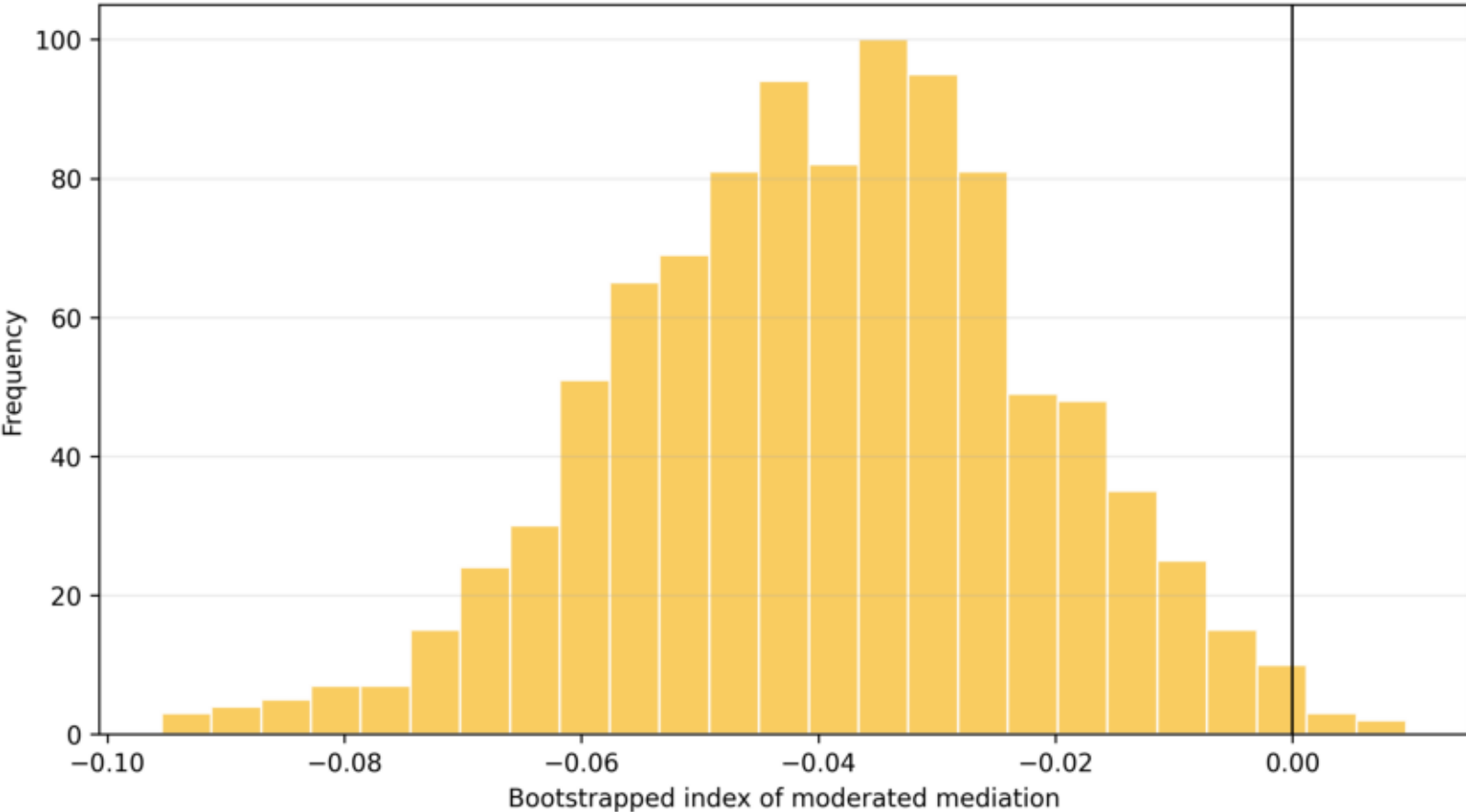
Conditional indirect effects

Bootstrap intervals not crossing zero support conditional mediation at that moderator level.



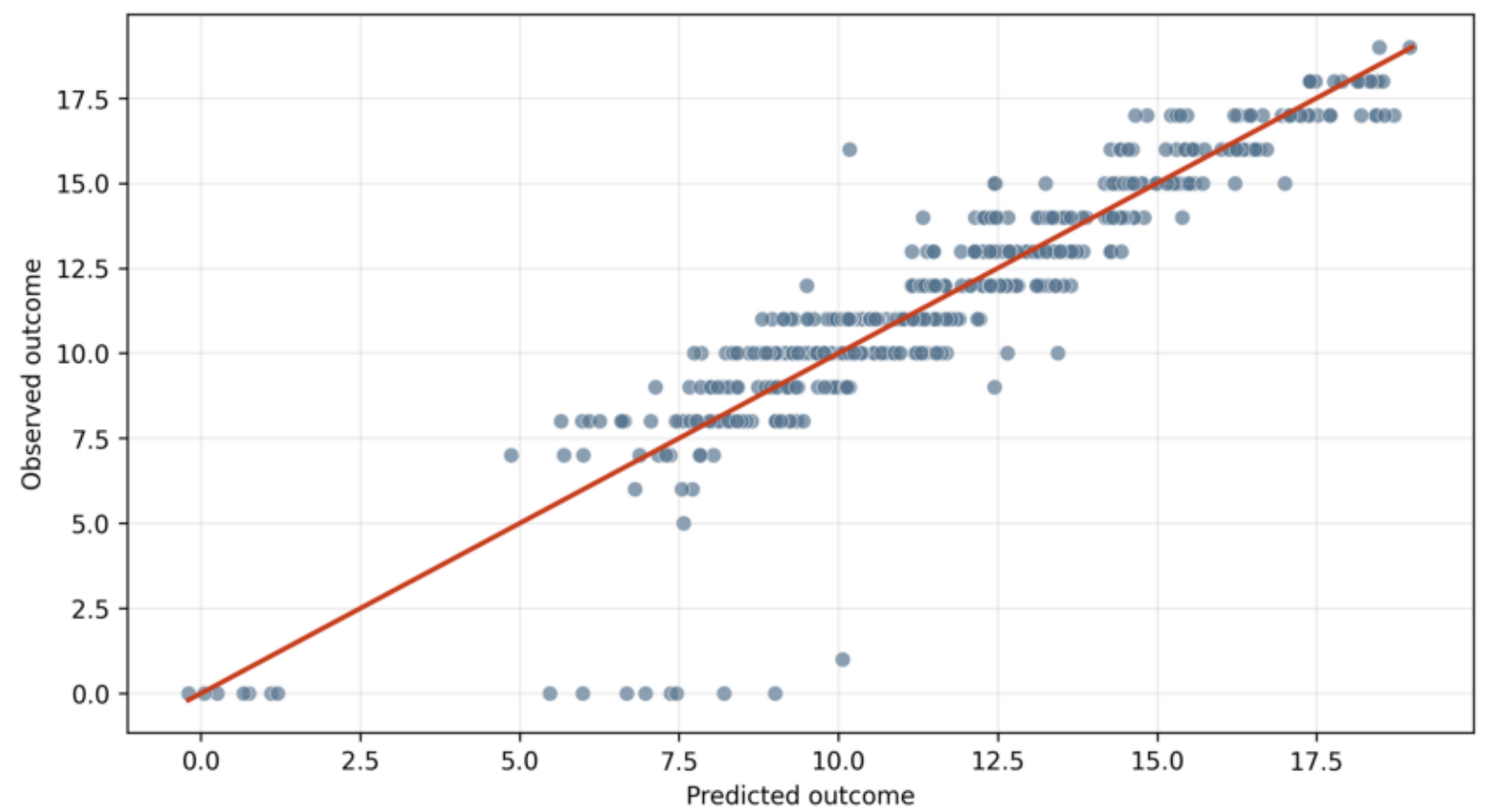
Bootstrap distribution of moderated mediation index

A percentile interval away from zero supports moderated mediation.



Observed vs predicted outcome

This chart checks how closely the moderated mediation outcome model reproduces observed outcomes.



Outcome-model residuals

Random residual scatter supports the linear outcome-model component of the moderated mediation analysis.

