Two Stage Path Analysis with Interaction for Categorical Indicators

Jimmy[1]

[1] University of Southern California

Author Note

Add Note

Two Stage Path Analysis with Interaction for Categorical Indicators

Results

Table 1

Standardized Bias and Raw Bias of Path Coefficient Estimates (γ) Across 2,000 Replications.

N	Skewness	UPI-All	2SPA	LMS	LMS-FS
			$\gamma = 0$		
100	symm	0.00 (0.00)	-0.03 (-0.00)	-0.03 (-0.00)	-0.03 (-0.00)
250	symm	0.01 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (-0.00)
500	symm	0.01 (0.00)	0.01 (0.00)	0.02 (0.00)	0.02 (0.00)
100	skew	-0.12 (-0.07)	-0.14 (-0.03)	1.12 (0.41)	-0.02 (-0.00)
250	skew	-0.41 (-0.13)	-0.28 (-0.03)	0.27 (0.06)	-0.03 (-0.00)
500	skew	-0.78 (-0.16)	-0.36 (-0.03)	0.04 (0.00)	-0.01 (-0.00)
			$\gamma = 0.3$		
100	symm	0.23 (0.13)	0.05 (0.01)	-0.13 (-0.02)	-0.22 (-0.03)
250	symm	**0.45 (0.13)**	0.16 (0.02)	-0.08 (-0.01)	-0.12 (-0.01)
500	symm	**0.62 (0.12)**	0.32 (0.02)	-0.06 (-0.00)	-0.05 (-0.00)
100	skew	-0.03 (-0.02)	-0.05 (-0.01)	**0.74 (0.17)**	-0.19 (-0.03)
250	skew	0.17 (0.07)	-0.09 (-0.01)	0.20 (0.03)	-0.10 (-0.01)
500	skew	0.35 (0.11)	-0.04 (-0.00)	-0.02 (-0.00)	-0.02 (-0.00)

Table 2

Raw Relative Standard Error (SE) Bias Ratio and Outlier Proportion of SE (%) of Path Coefficient Estimates (γ) Across 2,000 Replications.

N	Skewness	UPI-All	2SPA	LMS	LMS-FS
			$\gamma = 0$		
100	symm	**-18.00 (11.1)**	-0.00 (5.05)	8.00 (3.4)	**-75.00 (3.9)**
250	symm	-10.00 (8.35)	-0.00 (2.25)	1.00 (2.1)	**-80.00 (5.75)**
500	symm	-5.00 (6.5)	0.00 (2)	1.00 (2.65)	**-79.00 (6.2)**
100	skew	**-29.00 (10.6)**	-2.00 (5.5)	**-61.00 (12.8)**	**-77.00 (4.6)**
250	skew	**-30.00 (9.15)**	1.00 (3.3)	**-61.00 (2.95)**	**-79.00 (5.3)**
500	skew	**-20.00 (7.05)**	-2.00 (2.1)	**-25.00 (1.8)**	**-82.00 (5.45)**
			$\gamma = 0.3$		
100	symm	-6.00 (11.6)	2.00 (4.3)	1.00 (3.95)	**-52.00 (3.7)**
250	symm	**-11.00 (9.9)**	9.00 (1.9)	4.00 (3.05)	**-42.00 (4.4)**
500	symm	**-13.00 (7.3)**	9.00 (2.1)	5.00 (2.35)	**-34.00 (6.4)**
100	skew	**-31.00 (9.35)**	-0.00 (5.8)	**-39.00 (10)**	**-57.00 (2.7)**
250	skew	**-42.00 (10.15)**	5.00 (3.15)	**-35.00 (3.45)**	**-52.00 (2.7)**
500	skew	**-37.00 (9.8)**	7.00 (2.05)	-4.00 (2.2)	**-48.00 (2.95)**

Table 3

Robust Relative Standard Error (SE) Bias Ratio and Outlier Proportion of SE (%) of Path Coefficient Estimates (γ) Across 2,000 Replications.

N	Skewness	UPI-All	2SPA	LMS	LMS-FS
			$\gamma = 0$		
100.00	symm	5.00 (11.1)	1.00 (5.05)	-7.00 (3.4)	**-83.00 (3.9)**
250.00	symm	4.00 (8.35)	-2.00 (2.25)	-1.00 (2.1)	**-87.00 (5.75)**
500.00	symm	-1.00 (6.5)	-1.00 (2)	-4.00 (2.65)	**-90.00 (6.2)**
100.00	skew	-10.00 (10.6)	-0.00 (5.5)	**-64.00 (12.8)**	**-83.00 (4.6)**
250.00	skew	**-12.00 (9.15)**	-1.00 (3.3)	**-14.00 (2.95)**	**-88.00 (5.3)**
500.00	skew	-6.00 (7.05)	-3.00 (2.1)	-4.00 (1.8)	**-90.00 (5.45)**
			$\gamma = 0.3$		
100.00	symm	-10.00 (11.6)	4.00 (4.3)	-9.00 (3.95)	**-60.00 (3.7)**
250.00	symm	-1.00 (9.9)	**11.00 (1.9)**	2.00 (3.05)	**-52.00 (4.4)**
500.00	symm	-1.00 (7.3)	10.00 (2.1)	2.00 (2.35)	**-50.00 (6.4)**
100.00	skew	**-25.00 (9.35)**	6.00 (5.8)	**-45.00 (10)**	**-58.00 (2.7)**
250.00	skew	**-25.00 (10.15)**	4.00 (3.15)	**-13.00 (3.45)**	**-56.00 (2.7)**
500.00	skew	**-28.00 (9.8)**	9.00 (2.05)	2.00 (2.2)	**-53.00 (2.95)**

Table 4

Coverage Rate of 95 % Confidence Interval (CI) of Path Coefficient Estimates (γ) Across 2,000 Replications.

N	Skewness	UPI-All	2SPA	LMS	LMS-FS
		$\gamma = 0$			
100	symm	99	96.00	93	**19**
250	symm	99	96.00	94	**16**
500	symm	98	95.00	94	**16**
100	skew	98	97.00	**38**	**19**
250	skew	95	96.00	**86**	**18**
500	skew	**88**	94.00	93	**15**
		$\gamma = 0.3$			
100	symm	91	97.00	93	**61**
250	symm	96	97.00	95	**67**
500	symm	98	97.00	96	**69**
100	skew	**78**	96.00	**54**	**60**
250	skew	**86**	95.00	**85**	**64**
500	skew	**90**	96.00	95	**65**

Table 5

Root Mean Square Error (RMSE) of Latent Interaction Estimates (γ) Across 2,000 Replications.

N	Skewness	UPI-All	2SPA	LMS	LMS-FS
		$\gamma = 0$			
100	symm	0.49	0.16	0.14	0.13
250	symm	0.19	0.10	0.08	0.08
500	symm	0.11	0.07	0.06	0.06
100	skew	0.60	0.19	0.55	0.15
250	skew	0.34	0.11	0.23	0.09
500	skew	0.25	0.08	0.08	0.06
		$\gamma = 0.3$			
100	symm	0.57	0.16	0.13	0.13
250	symm	0.33	0.10	0.08	0.08
500	symm	0.24	0.07	0.05	0.05
100	skew	0.60	0.19	0.29	0.14
250	skew	0.44	0.11	0.14	0.09
500	skew	0.32	0.07	0.06	0.06

Table 6

Empirical Type I Error Rate and Statistical Power Across 2,000 Replications.

N	Skewness	UPI-All	2SPA	LMS	LMS-FS
Empirical Type I Error Rate ($\gamma = 0$)					
100	symm	0.01	0.04	0.07	0.81
250	symm	0.01	0.04	0.06	0.84
500	symm	0.02	0.05	0.06	0.84
100	skew	0.02	0.03	0.62	0.81
250	skew	0.05	0.04	0.14	0.82
500	skew	0.12	0.06	0.07	0.85
Statistical Power ($\gamma = 0.3$)					
100	symm	0.09	0.47	0.60	0.95
250	symm	0.47	0.91	0.94	0.96
500	symm	0.88	1.00	1.00	0.95
100	skew	0.12	0.35	0.79	0.95
250	skew	0.36	0.79	0.90	0.98
500	skew	0.68	0.98	1.00	0.98