Forgiveness Takes Place on an Attitudinal Continuum from Hostility to Friendliness

Supplemental Information

Contents

Analyses Separated by Study

Study 1

Descriptive Statistics

Table 1: Descriptive Statistics in Study 1

Item	mean	sd
pdg	3.865952	4.1479148
tg	4.487421	3.9045500
dg	2.731466	2.4860100
ptpg	1.194585	2.8967026
trim1	1.803838	1.0836512
trim2	2.665062	1.2820471
trim3	3.564267	1.1703847
trim4	1.511987	0.9249504
trim5	2.646055	1.3082264
trim6	3.368730	1.1944451
trim7	3.263859	1.2900418
trim8	3.526147	1.1532861
trim9	2.564171	1.2447427
trim10	3.412487	1.1804937
trim11	2.696000	1.3323654
trim12	3.026652	1.2076793
trim13	1.849973	1.0788473
trim14	3.668446	1.1531046
trim15	2.875800	1.3600120
trim16	3.856153	1.1514248
trim17	1.651386	1.0029307
trim18	2.688865	1.3251498

Model Selection

Models were fit using congeneric (one-, two-, and three-factor) models as well as the bifactor (S-1) model. Although the bifactor (S-1) model demonstrated superior model fit over the three-factor model, as it was specified here, these two models are treated as equivalent based on previous research demonstrating equivalence (Geiser, Eid, & Nussbeck, 2008).

Table 2: Model fit for alternative structures in Study 1

model	ChiSq (df), p	CFI	TLI	RMSEA [90% CI]
1factor	8069.915 (119), < .001	0.930	0.920	0.188 [0.185, 0.192]
2factor	4567.524 (118), < .001	0.961	0.955	0.142 [0.138, 0.145]
3factor	2739.256 (116), < .001	0.977	0.973	0.11 [0.106, 0.113]
bifactor	1676.435 (108), < .001	0.986	0.983	0.088 [0.084, 0.092]

Invariance

Tests of invariance were conducted to determine whether the factors retain their meaning across experimental contexts. To conduct these analyses, we had to make a couple adjustments to our model specification from those reported in the main text. First, we treated item responses as continuous, as testing for invariance on categorical indicators requires that every response option for every item is endorsed at least once in each condition; considering that some conditions had no respondants who endorsed certain item values, especially for the smaller studies (2 & 3), we found this compromise to be acceptable. Second, we tested invariance on the three-factor model rather than the bifactor (S-1) models because the grouping analyses with the bifactor (S-1) models posed convergence problems.

These adjustments aside, these analyses demonstrated that the congeneric factors in the three factor model were invariance across experimental contexts, which we used as evidence to infer that our general factor (and specific factors) from the bifactor (S-1) model is also invariant.

Table 3: Invariance Across Conditions for Study 1

model	ChiSq (df), p	ChiSq diff	CFI	CFI_diff	TLI	RMSEA [90% CI]	SRMR
config	1451.734 (348), $< .001$	NA	0.958	NA	0.951	0.071 [0.067, 0.075]	0.043
metric	1535.016 (382), $< .001$	83.282 (34), $< .001$	0.956	0.002	0.953	0.069 [0.066, 0.073]	0.088
scalar	1590.168 (410), $< .001$	55.152 (28), 0.002	0.955	0.001	0.955	0.068 [0.064, 0.071]	0.088

Structural Equation Models

Table 4: Study 1 Regressions Using 3-Factor Congeneric Model

model	Outcome	Predictor	beta	se	z	pval
three-factor	PDG	AVOID	-0.340	0.072	-4.735	$<$ .001
three-factor	PDG	REVENGE	-0.017	0.053	-0.318	0.75
three-factor	PDG	BENEV	-0.139	0.095	-1.463	0.144
three-factor	TG	AVOID	0.080	0.108	0.740	0.459
three-factor	TG	REVENGE	-0.054	0.081	-0.664	0.507
three-factor	TG	BENEV	0.251	0.141	1.780	0.075
three-factor	DG	AVOID	0.300	0.115	2.611	0.009
three-factor	DG	REVENGE	0.033	0.074	0.449	0.653
three-factor	DG	BENEV	0.064	0.144	0.441	0.66
three-factor	PTPG	AVOID	-0.042	0.120	-0.349	0.727
three-factor	PTPG	REVENGE	-0.273	0.071	-3.829	$<$ .001
three-factor	PTPG	BENEV	-0.076	0.150	-0.503	0.615

Table 5: Study 1 Regressions Using Bifactor (S-1) Model

model	Outcome	Predictor	beta	se	z	pval
bifactor	PDG	GEN	-0.480	0.026	-18.404	$<$ .001
bifactor	PDG	BENEV	-0.057	0.043	-1.337	0.181
bifactor	PDG	REVENGE	-0.010	0.038	-0.271	0.786
bifactor	TG	GEN	0.264	0.040	6.594	$<$ .001
bifactor	TG	BENEV	0.139	0.064	2.170	0.03
bifactor	TG	REVENGE	-0.053	0.063	-0.844	0.399
bifactor	DG	GEN	0.380	0.034	11.095	$<$ .001
bifactor	DG	BENEV	0.016	0.059	0.278	0.781
bifactor	DG	REVENGE	0.036	0.062	0.580	0.562
bifactor	PTPG	GEN	-0.261	0.040	-6.578	$<$ .001
bifactor	PTPG	BENEV	-0.040	0.061	-0.654	0.513
bifactor	PTPG	REVENGE	-0.225	0.056	-4.000	$<$ .001

Table 6: Study 1 Regressions Using Composite Scores

model	Outcome	Predictor	b	se	z	pval	beta
composite	PDG	TRIM_CMP	-0.566	0.032	-17.598	$<$ .001	-0.451
composite	TG	TRIM_CMP	1.178	0.207	5.685	$<$ .001	0.270
composite	DG	TRIM_CMP	1.022	0.121	8.431	$<$ .001	0.378
composite	PTPG	TRIM_CMP	-1.062	0.130	-8.157	$<$ .001	-0.333

Psychometrics

Table 7: Standardized Factor Loadings from Bifactor (S-1) in Study 1

paramHeader	param	est	se	est_se	pval
GEN.BY	TRIM7	0.818	0.008	100.110	< .001
GEN.BY	TRIM2	0.909	0.005	189.029	< .001
GEN.BY	TRIM5	0.916	0.005	202.625	< .001
GEN.BY	TRIM11	0.924	0.004	218.670	< .001
GEN.BY	TRIM12	0.887	0.006	155.780	< .001
GEN.BY	TRIM15	0.915	0.004	212.207	< .001
GEN.BY	TRIM18	0.931	0.004	246.716	< .001
GEN.BY	TRIM3	0.774	0.010	79.558	< .001
GEN.BY	TRIM6	0.805	0.008	97.082	< .001
GEN.BY	TRIM8	0.808	0.008	96.172	< .001
GEN.BY	TRIM10	0.810	0.008	97.042	< .001
GEN.BY	TRIM14	0.540	0.016	34.569	< .001
GEN.BY	TRIM16	0.560	0.016	35.956	< .001
GEN.BY	TRIM17	0.541	0.020	27.519	< .001
GEN.BY	TRIM1	0.542	0.018	29.874	< .001
GEN.BY	TRIM4	0.512	0.022	23.487	< .001
GEN.BY	TRIM13	0.512	0.019	27.491	< .001
BENEV.BY	TRIM3	0.342	0.014	24.672	< .001
BENEV.BY	TRIM6	0.294	0.012	23.719	< .001
BENEV.BY	TRIM8	0.291	0.013	22.378	< .001
BENEV.BY	TRIM10	0.297	0.013	22.367	< .001
BENEV.BY	TRIM14	0.593	0.015	39.838	< .001
BENEV.BY	TRIM16	0.618	0.015	41.128	< .001
REVENGE.BY	TRIM17	0.735	0.013	54.831	< .001
REVENGE.BY	TRIM1	0.721	0.012	59.238	< .001
REVENGE.BY	TRIM4	0.671	0.015	43.933	< .001
REVENGE.BY	TRIM13	0.739	0.012	60.518	< .001

Internal Consistency

McDonald's ω Hierarchical (General Factor): 0.8995496

McDonald's ω Hierarchical Subscale (Benevolence Factor): 0.226987

McDonald's ω Hierarchical Subscale (Revenge Factor): 0.6091449

Construct Reliability

"In contrast to omegaH and omegaHS values, which provide the correlation between a factor and a unit-weighted composite, H values provide the correlation between a factor and an optimally weighted item composite." (Rodriguez et al., p. 7)

General Factor: H = 0.9771178

Benevolence Factor: H = 0.6118957

Revenge Factor: H = 0.8105999

"Hancock and Mueller (2001) have justified the need to meet a standard criterion of H = .70. . . " (ibid., p. 7)

By Hancock and Mueller's criterion, the general and revenge factors are represented well, but the benevolence factor is not specified reliably.

Explained Common Variance

"... simply because the data are more statistically consistent with a bifactor structure, for example, does not necessarily require that all the variables must be specified in a measurement model or that the more complex bifactor model even is necessary." (ibid., p. 7)

"We are not interested in the fitting of IRT models here, but rather in deciding whether to treat the multidimensional data with a bifactor structure as essentially unidimensional in an SEM measurement model." (ibid., p. 8)

ECV = 0.7586168, meaning that the general factor explains 0.7586168 of the common variance extracted with 0.2413832 spread across group factors.

Percent Uncontaminated Correlations

"To demonstrate the use of ECV and PUC, consider the MASC, with values of .80 and .77, respectively, on these indices. Under such conditions, we expect very little difference in the factor loadings between a unidimensional model and the general factor in a bifactor model." (ibid., p. 9)

PUC = 0.8455882

With our values of ECV and PUC being 0.759 and 0.846, respectively, we should also expect very little difference in the factor loadings between a unidimensional model and the general factor.

Average Parameter Bias

"We then computed the relative parameter bias as the difference between an item's loading in the unidimensional solution and its general factor loading in the bifactor (i.e., the truer model), divided by the general factor loading in the bifactor... According to Muthén, Kaplan, and Hollis (1987), parameter bias less than 10–15% is acceptable and poses no serious concern." (ibid., p. 9)

average bias = 0.1406559

"As a consequence, a unidimensional measurement model in the context of SEM well may suffice for the MASC, even though such a model would not provide a good statistical fit to the data." (ibid., p. 9)

Table 8: Item Discrimination, Thresholds, and Location Indices for Study 1

Item	subscale	a	b1	b2	b3	b4	LI_irf
TRIM4	REV	0.626	-2.119	-1.629	-1.045	-0.538	-1.3328610
TRIM17	REV	0.661	-1.997	-1.469	-0.921	-0.308	-1.1744799
TRIM1	REV	0.663	-1.860	-1.321	-0.749	-0.121	-1.0135615
TRIM13	REV	0.626	-1.923	-1.292	-0.707	-0.038	-0.9903676
TRIM16	BEN	0.685	-1.590	-1.147	-0.452	0.350	-0.7139756
TRIM14	BEN	0.661	-1.543	-1.039	-0.248	0.579	-0.5669415
TRIM3	BEN	0.947	-1.505	-0.935	-0.128	0.661	-0.4826357
TRIM8	BEN	0.989	-1.473	-0.894	-0.173	0.795	-0.4491716
TRIM10	BEN	0.991	-1.384	-0.793	-0.037	0.860	-0.3483638
TRIM6	BEN	0.984	-1.377	-0.723	0.013	0.866	-0.3116452
TRIM5	AVO	1.120	-1.186	-0.618	-0.007	0.715	-0.2786329
TRIM2	AVO	1.112	-1.211	-0.645	0.044	0.756	-0.2685340
TRIM18	AVO	1.139	-1.147	-0.555	0.009	0.740	-0.2425985
TRIM11	AVO	1.130	-1.149	-0.522	-0.001	0.739	-0.2367978
TRIM15	AVO	1.120	-0.997	-0.370	0.142	0.857	-0.0946019
TRIM12	AVO	1.084	-1.114	-0.449	0.352	1.157	-0.0188839
TRIM7	AVO	1.000	-0.814	-0.088	0.550	1.186	0.2108999

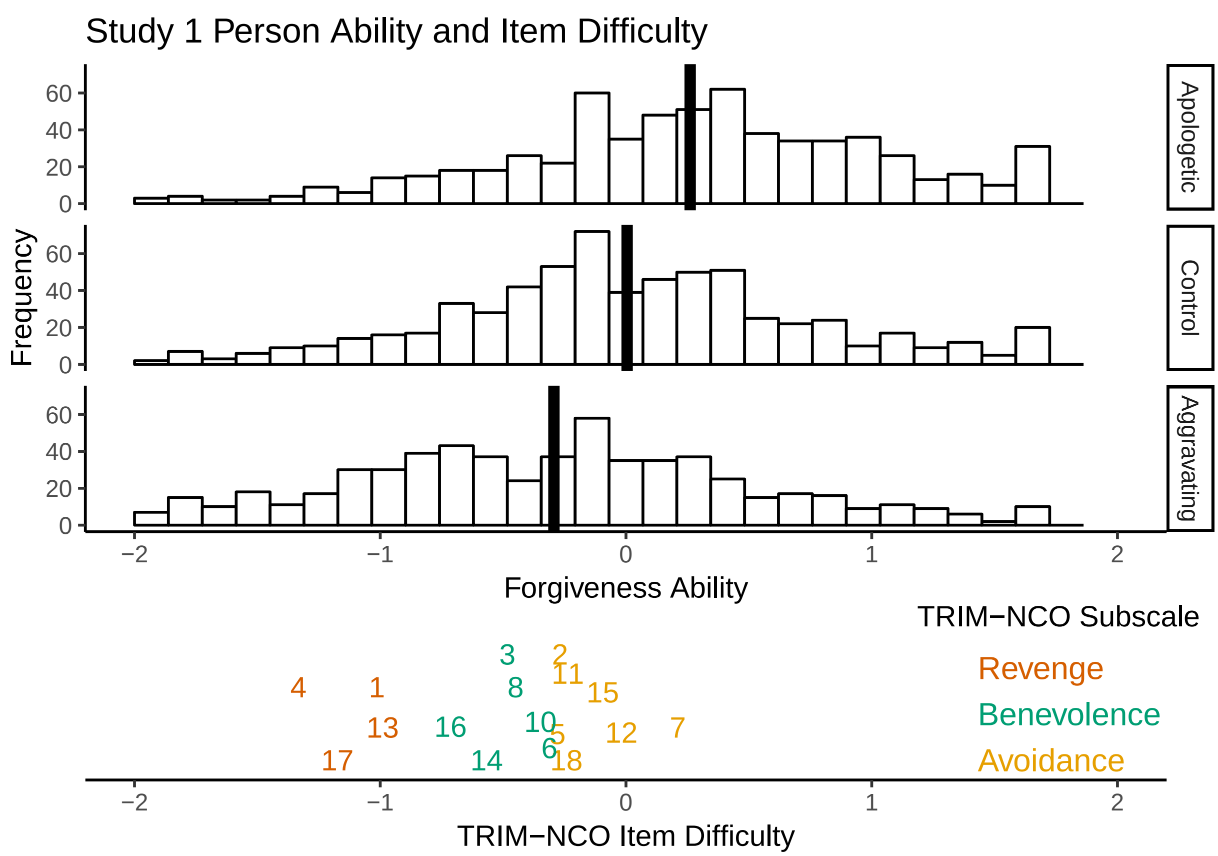
Effects of Apologies

On All Outcomes

Table 9: Main Effects for Each Outcome (Study 1)

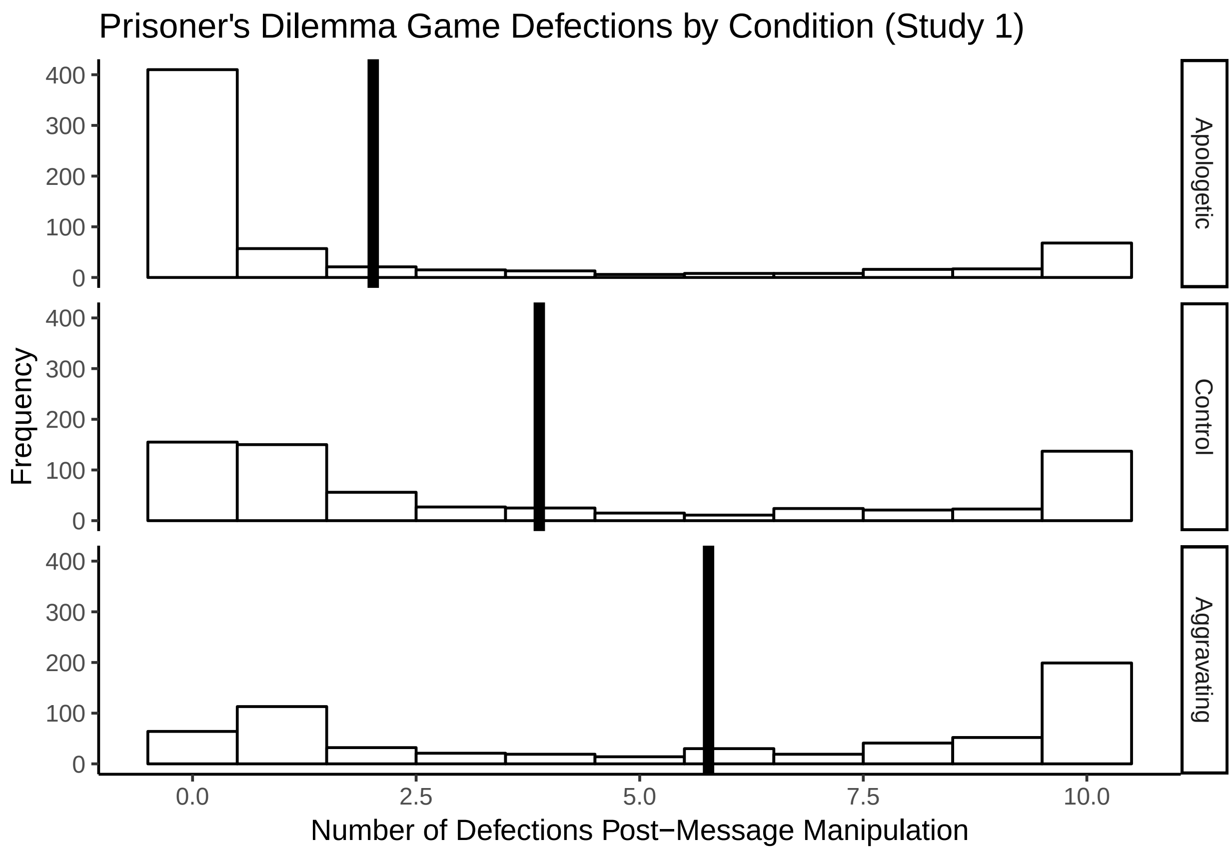
outcome	predictor	est	se	est_se	pval
GEN	Apologetic v. Control	0.481	0.086	5.600	< .001
GEN	Aggravating v. Control	-0.568	0.087	-6.539	< .001
BENEV	Apologetic v. Control	-0.116	0.047	-2.476	0.013
BENEV	Aggravating v. Control	0.041	0.047	0.855	0.392
REVENGE	Apologetic v. Control	-0.119	0.140	-0.848	0.397
REVENGE	Aggravating v. Control	-0.015	0.141	-0.110	0.912
PDG	Apologetic v. Control	-0.560	0.069	-8.058	< .001
PDG	Aggravating v. Control	0.525	0.064	8.169	< .001
TG	Apologetic v. Control	-0.039	0.355	-0.110	0.913
TG	Aggravating v. Control	-1.933	0.415	-4.654	< .001
DG	Apologetic v. Control	0.623	0.249	2.505	0.012
DG	Aggravating v. Control	-0.200	0.247	-0.811	0.417
PTPG	Apologetic v. Control	-0.317	0.330	-0.960	0.337
PTPG	Aggravating v. Control	0.592	0.278	2.127	0.033

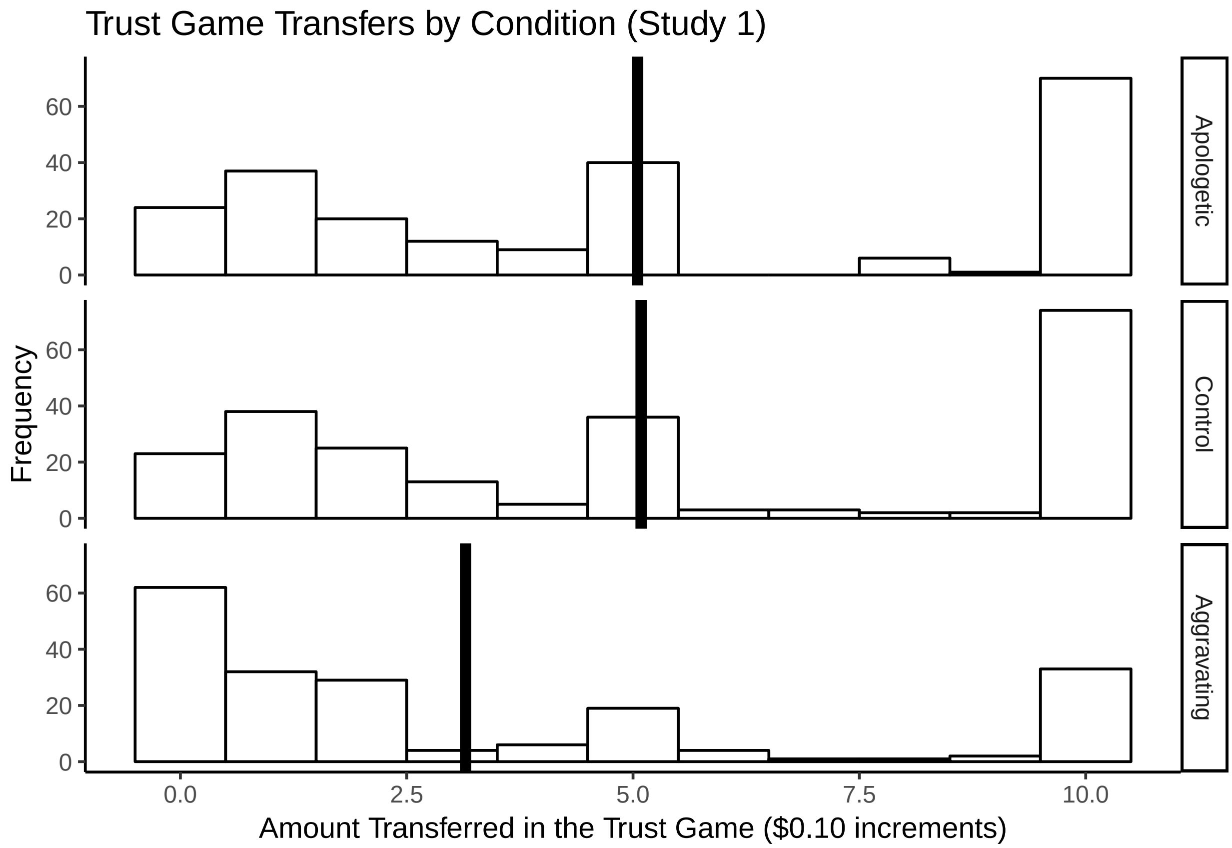
On the Forgiveness Continuum

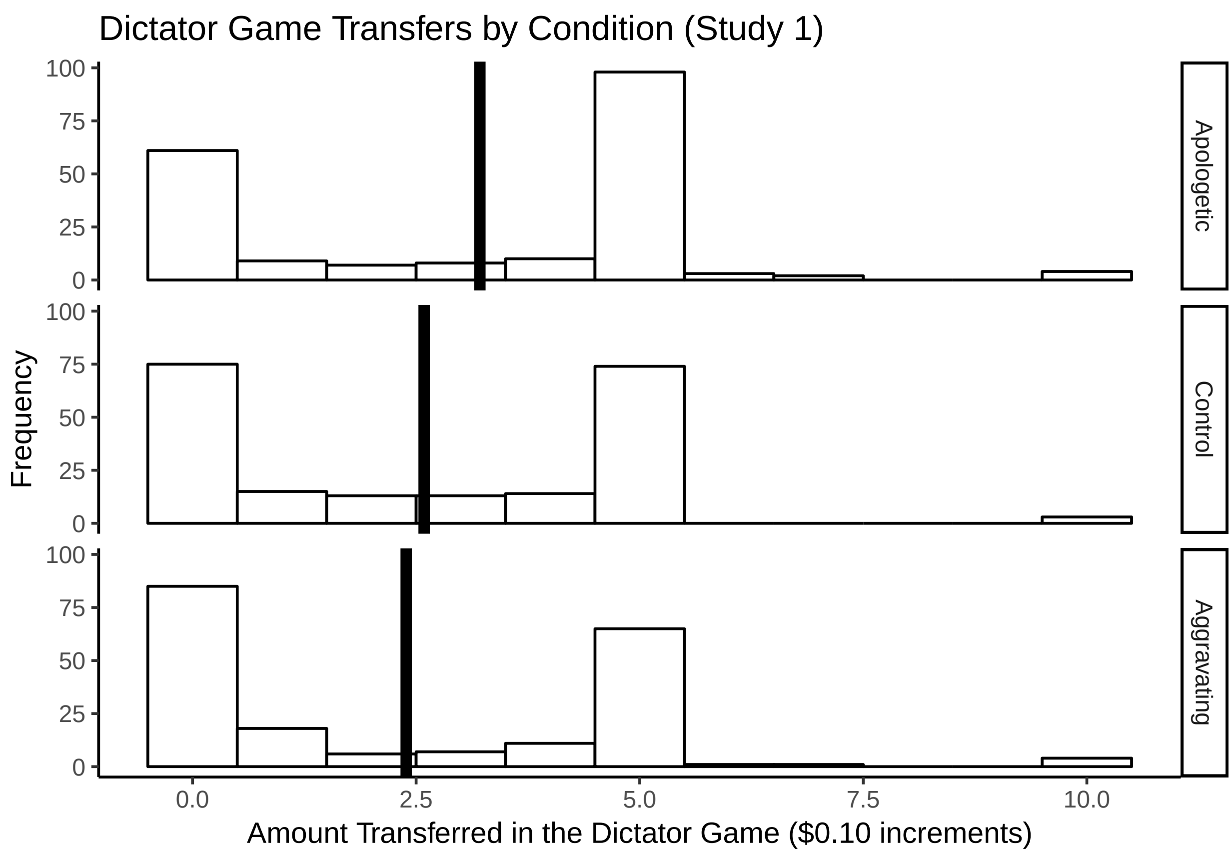


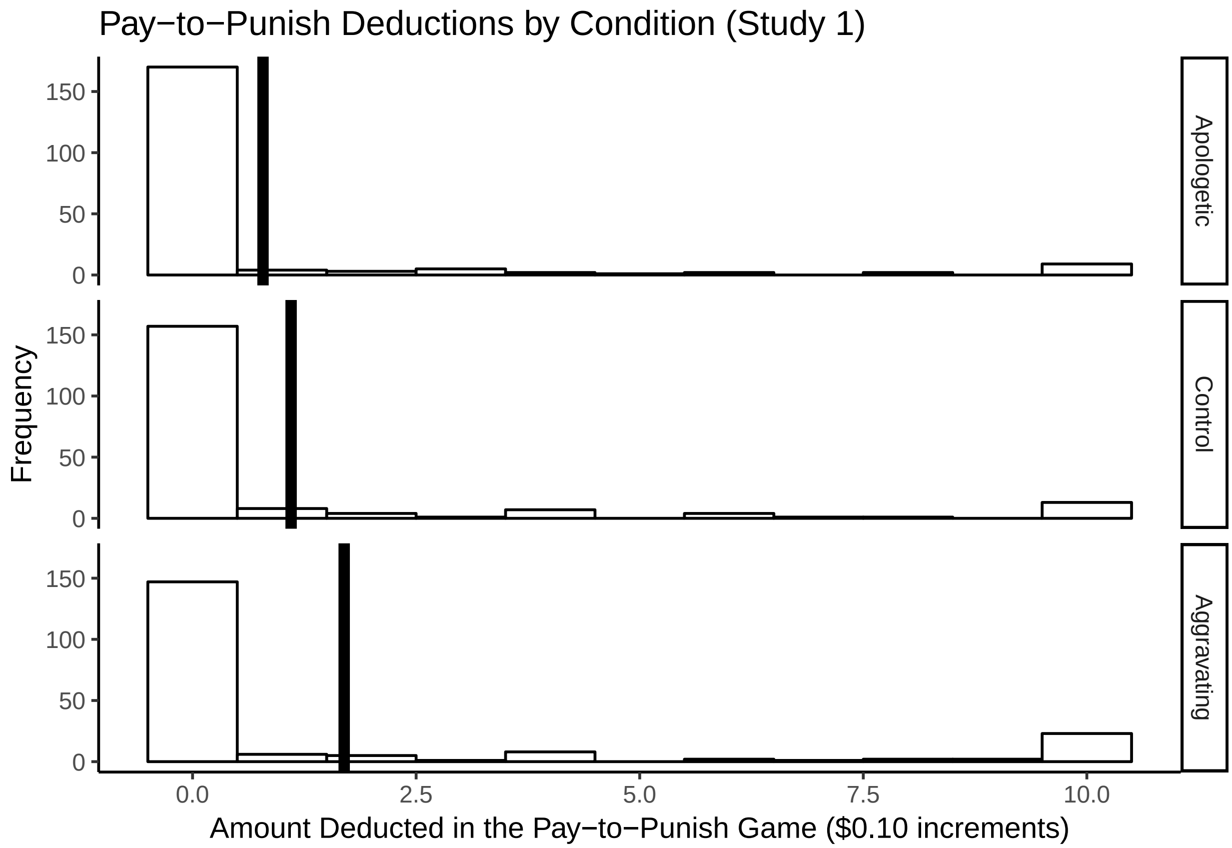
On Economic Game Outcomes

Central tendency in each figure represents the mean.




Trust Game Transfers by Condition (Study 1)
Frequency
Apologetic
Control
Aggravating
0
20
40
60
0.0
2.5
5.0
7.5
10.0
Amount Transferred in the Trust Game ($0.10 increments)


Dictator Game Transfers by Condition (Study 1)
Frequency
Apologetic
Control
Aggravating
0
25
50
75
100
0.0
2.5
5.0
7.5
10.0
Amount Transferred in the Dictator Game ($0.10 increments)


Pay−to−Punish Deductions by Condition (Study 1)
Frequency
150
100
50
0
Apologetic
Control
Aggravating
0.0
2.5
5.0
7.5
10.0
Amount Deducted in the Pay−to−Punish Game ($0.10 increments)

On Convergent Validity

We tested whether the general factor retained its predictive utility for each outcome across apology conditions. However, we note that these analyses resulted in a massive increase in the number of regressions tested (increasing the likelihood of Type I errors) while simultaneously reducing statistical power for each analysis (increasing the likelihood of Type II errors). Therefore, the patterns of consistent and inconsistent effects should be interpreted with caution.

Table 10: Predictive Utility of General Factor Across Conditions (Study 1)

Group	outcome	predictor	est	se	est_se	pval
AP	***PDG***	***GEN***	***-0.665***	***0.077***	***-8.631***	***< .001***
AP	PDG	BENEV	-0.405	0.242	-1.672	0.095
AP	PDG	REVENGE	-0.213	0.122	-1.747	0.081
AP	***TG***	***GEN***	***1.349***	***0.333***	***4.044***	***< .001***
AP	TG	BENEV	2.025	1.225	1.653	0.098
AP	TG	REVENGE	0.366	0.587	0.623	0.533
AP	***DG***	***GEN***	***1.210***	***0.201***	***6.016***	***< .001***
AP	DG	BENEV	0.231	0.796	0.291	0.771
AP	DG	REVENGE	0.464	0.368	1.260	0.208
AP	***PTPG***	***GEN***	***-0.542***	***0.242***	***-2.241***	***0.025***
AP	PTPG	BENEV	-0.119	0.836	-0.143	0.886
AP	PTPG	REVENGE	-0.491	0.444	-1.106	0.269
NE	PDG	GEN	-0.561	0.066	-8.448	< .001
NE	PDG	BENEV	-0.229	0.221	-1.039	0.299
NE	PDG	REVENGE	0.028	0.106	0.265	0.791
NE	***TG***	***GEN***	***0.561***	***0.361***	***1.554***	***0.12***
NE	***TG***	***BENEV***	***0.193***	***1.193***	***0.162***	***0.872***
NE	***TG***	***REVENGE***	***0.046***	***0.603***	***0.076***	***0.94***
NE	***DG***	***GEN***	***1.085***	***0.233***	***4.653***	***< .001***
NE	DG	BENEV	-0.563	0.816	-0.690	0.49
NE	DG	REVENGE	0.031	0.363	0.085	0.933
NE	***PTPG***	***GEN***	***-1.053***	***0.231***	***-4.562***	***< .001***
NE	PTPG	BENEV	-0.541	0.850	-0.636	0.525
NE	PTPG	REVENGE	-1.548	0.389	-3.982	< .001
AG	***PDG***	***GEN***	***-0.480***	***0.061***	***-7.814***	***< .001***
AG	PDG	BENEV	-0.223	0.228	-0.979	0.328
AG	PDG	REVENGE	0.019	0.097	0.193	0.847
AG	***TG***	***GEN***	***1.317***	***0.341***	***3.863***	***< .001***
AG	TG	BENEV	2.591	1.181	2.193	0.028
AG	TG	REVENGE	-1.242	0.519	-2.393	0.017
AG	***DG***	***GEN***	***1.001***	***0.216***	***4.640***	***< .001***
AG	DG	BENEV	1.160	0.824	1.408	0.159
AG	***DG***	***REVENGE***	***-0.393***	***0.335***	***-1.173***	***0.241***
AG	***PTPG***	***GEN***	***-1.234***	***0.265***	***-4.650***	***< .001***
AG	PTPG	BENEV	0.164	1.110	0.147	0.883
AG	***PTPG***	***REVENGE***	***-1.432***	***0.506***	***-2.829***	***0.005***

Study 2

Descriptive Statistics

Table 11: Descriptive Statistics in Study 2

Item	mean	sd
pdg	2.969121	3.7188703
tg	5.242280	3.8076638
trim1	2.095012	0.8812863
trim2	2.339668	0.8258150
trim3	3.589074	0.7494597
trim4	1.900238	0.8420638
trim5	2.467934	0.8234901
trim6	3.451306	0.8313096
trim7	2.826603	0.9080881
trim8	3.712589	0.7208184
trim9	2.636580	1.0481238
trim10	3.505938	0.7856377
trim11	2.427553	0.8062854
trim12	3.306413	0.7737858
trim13	2.375297	0.9292894
trim14	3.534442	0.7664864
trim15	2.510689	0.8880180
trim16	3.484561	0.8439556
trim17	2.045131	0.8537627
trim18	2.441805	0.8044878

Model Selection

Table 12: Model fit for alternative structures in Study 2

model	ChiSq (df), p	CFI	TLI	RMSEA [90% CI]
1factor	1354.381 (119), < .001	0.847	0.825	0.179 [0.171, 0.188]
2factor	717.564 (118), < .001	0.926	0.914	0.125 [0.117, 0.134]
3factor	457.166 (116), < .001	0.958	0.950	0.095 [0.086, 0.105]
bifactor	393.454 (108), < .001	0.965	0.955	0.09 [0.081, 0.1]

Invariance

Table 13: Invariance Across Conditions for Study 2

model	ChiSq (df), p	ChiSq diff	CFI	CFI_diff	TLI	RMSEA [90% CI]	SRMR
config	821.156 (464), < .001	NA	0.897	NA	0.880	0.086 [0.076, 0.095]	0.072
metric	874.74 (515), < .001	53.584 (51), 0.375	0.897	0.000	0.891	0.081 [0.072, 0.091]	0.106
scalar	944.329 (557), < .001	69.589 (42), 0.005	0.889	0.008	0.891	0.081 [0.072, 0.09]	0.110

We also tested whether our measure of forgiveness was invariant between community (n = 79) and student (n = 342) samples. We found that the two subsamples were invariant.

Table 14: Invariance Across Subsamples for Study 2

model	ChiSq (df), p	ChiSq diff	CFI	CFI_diff	TLI	RMSEA [90% CI]	SRMR
config_comm	425.243 (232), < .001	NA	0.946	NA	0.937	0.063 [0.053, 0.072]	0.056
metric_comm	446.603 (249), < .001	21.36 (17), 0.211	0.945	0.001	0.940	0.061 [0.052, 0.071]	0.095
scalar_comm	467.106 (263), < .001	20.503 (14), 0.115	0.943	0.002	0.941	0.061 [0.052, 0.07]	0.095

Structural Equation Models

Table 15: Study 2 Regressions Using 3-Factor Congeneric Model

model	Outcome	Predictor	beta	se	z	pval
three-factor	PDG	AVOID	-0.156	0.106	-1.466	0.143
three-factor	PDG	REVENGE	-0.017	0.096	-0.180	0.857
three-factor	PDG	BENEV	-0.212	0.118	-1.799	0.072
three-factor	TG	AVOID	0.079	0.092	0.861	0.389
three-factor	TG	REVENGE	-0.202	0.082	-2.474	0.013
three-factor	TG	BENEV	0.341	0.105	3.251	0.001

Table 16: Study 2 Regressions Using Bifactor (S-1) Model

model	Outcome	Predictor	beta	se	z	pval
bifactor	PDG	GEN	-0.309	0.058	-5.297	< .001
bifactor	PDG	REVENGE	0.012	0.082	0.151	0.88
bifactor	PDG	BENEV	-0.194	0.086	-2.253	0.024
bifactor	TG	GEN	0.209	0.055	3.834	< .001
bifactor	TG	REVENGE	-0.185	0.070	-2.653	0.008
bifactor	TG	BENEV	0.224	0.075	3.004	0.003

Table 17: Study 2 Regressions Using Composite Scores

model	Outcome	Predictor	b	se	z	pval	beta
composite	PDG	TRIM_CMP	-1.021	0.130	-7.824	< .001	-0.490
composite	TG	TRIM_CMP	2.274	0.516	4.405	< .001	0.329

Psychometrics

Table 18: Standardized Factor Loadings from Bifactor (S-1) in Study 2

paramHeader	param	est	se	est_se	pval
GEN.BY	TRIM7	0.738	0.022	33.137	0
GEN.BY	TRIM2	0.894	0.011	79.456	0
GEN.BY	TRIM5	0.840	0.016	52.777	0
GEN.BY	TRIM11	0.844	0.016	53.387	0
GEN.BY	TRIM12	0.775	0.023	34.240	0
GEN.BY	TRIM15	0.856	0.014	62.395	0
GEN.BY	TRIM18	0.876	0.013	69.049	0
GEN.BY	TRIM3	0.604	0.030	20.203	0
GEN.BY	TRIM6	0.504	0.030	16.653	0
GEN.BY	TRIM8	0.627	0.029	21.964	0
GEN.BY	TRIM10	0.594	0.030	19.901	0
GEN.BY	TRIM14	0.293	0.040	7.232	0
GEN.BY	TRIM16	0.198	0.038	5.260	0
GEN.BY	TRIM17	0.575	0.027	21.194	0
GEN.BY	TRIM1	0.613	0.028	21.678	0
GEN.BY	TRIM4	0.447	0.028	16.266	0
GEN.BY	TRIM13	0.503	0.033	15.264	0
BENEV.BY	TRIM3	0.425	0.036	11.681	0
BENEV.BY	TRIM6	0.444	0.033	13.475	0
BENEV.BY	TRIM8	0.393	0.039	10.172	0
BENEV.BY	TRIM10	0.351	0.037	9.561	0
BENEV.BY	TRIM14	0.607	0.054	11.292	0
BENEV.BY	TRIM16	0.542	0.044	12.306	0
REVENGE.BY	TRIM17	0.659	0.027	24.494	0
REVENGE.BY	TRIM1	0.555	0.023	23.839	0
REVENGE.BY	TRIM4	0.691	0.023	29.896	0
REVENGE.BY	TRIM13	0.551	0.032	17.485	0

Internal Consistency

McDonald's ω Hierarchical (General Factor): 0.826388

McDonald's ω Hierarchical Subscale (Benevolence Factor): 0.4438084

McDonald's ω Hierarchical Subscale (Revenge Factor): 0.5917854

Construct Reliability

"In contrast to omegaH and omegaHS values, which provide the correlation between a factor and a unit-weighted composite, H values provide the correlation between a factor and an optimally weighted item composite." (Rodriguez et al., p. 7)

General Factor: H = 0.9470488

Benevolence Factor: H = 0.6372247

Revenge Factor: H = 0.7605942

"Hancock and Mueller (2001) have justified the need to meet a standard criterion of H = .70. . . " (ibid., p. 7)

By Hancock and Mueller's criterion, the general and revenge factors are represented well, but the benevolence factor is not specified reliably.

Explained Common Variance

"…simply because the data are more statistically consistent with a bifactor structure, for example, does not necessarily require that all the variables must be specified in a measurement model or that the more complex bifactor model even is necessary." (ibid., p. 7)

"We are not interested in the fitting of IRT models here, but rather in deciding whether to treat the multidimensional data with a bifactor structure as essentially unidimensional in an SEM measurement model." (ibid., p. 8)

ECV = 0.7255757, meaning that the general factor explains 0.7255757 of the common variance extracted with 0.2744243 spread across group factors.

Percent Uncontaminated Correlations

"To demonstrate the use of ECV and PUC, consider the MASC, with values of .80 and .77, respectively, on these indices. Under such conditions, we expect very little difference in the factor loadings between a unidimensional model and the general factor in a bifactor model." (ibid., p. 9)

PUC = 0.8455882

With our values of ECV and PUC being 0.726 and 0.846, respectively, we should also expect very little difference in the factor loadings between a unidimensional model and the general factor.

Average Parameter Bias

"We then computed the relative parameter bias as the difference between an item's loading in the unidimensional solution and its general factor loading in the bifactor (i.e., the truer model), divided by the general factor loading in the bifactor… According to Muthén, Kaplan, and Hollis (1987), parameter bias less than 10–15% is acceptable and poses no serious concern." (ibid., p. 9)

average bias = 0.1985836

Data derived from Study 2 may be problematic, in terms of parameter bias, if we were to fit a unidimensional, rather than bifactor, model.

Table 19: Item Discrimination, Thresholds, and Location Indices for Study 2

Item	subscale	a	b1	b2	b3	b4	LI_irf
TRIM4	REV	0.606	-2.190	-1.941	-0.793	0.375	-1.1506586
TRIM17	REV	0.779	-2.451	-1.670	-0.610	0.582	-1.0519329
TRIM1	REV	0.830	-2.345	-1.560	-0.547	0.625	-0.9718073
TRIM8	BEN	0.849	-2.451	-1.774	-0.394	1.256	-0.8976160
TRIM2	AVO	1.211	-2.261	-1.521	-0.244	1.080	-0.7878619
TRIM3	BEN	0.818	-2.451	-1.560	-0.177	1.369	-0.7430393
TRIM11	AVO	1.143	-2.345	-1.416	-0.140	1.256	-0.7045751
TRIM13	REV	0.682	-2.261	-1.181	-0.213	0.950	-0.6789347
TRIM18	AVO	1.187	-2.345	-1.311	-0.195	1.369	-0.6772276
TRIM5	AVO	1.138	-2.190	-1.400	-0.057	1.256	-0.6412957
TRIM14	BEN	0.397	-2.345	-1.432	-0.116	1.449	-0.6208907
TRIM10	BEN	0.805	-2.261	-1.384	-0.063	1.432	-0.6022596
TRIM15	AVO	1.159	-2.075	-1.169	-0.051	1.230	-0.5477619
TRIM16	BEN	0.269	-2.129	-1.269	-0.021	1.311	-0.5297206
TRIM6	BEN	0.683	-2.190	-1.205	-0.003	1.416	-0.5124624
TRIM12	AVO	1.051	-2.345	-1.193	0.318	1.580	-0.4199954
TRIM7	AVO	1.000	-1.774	-0.826	0.368	1.560	-0.1840382

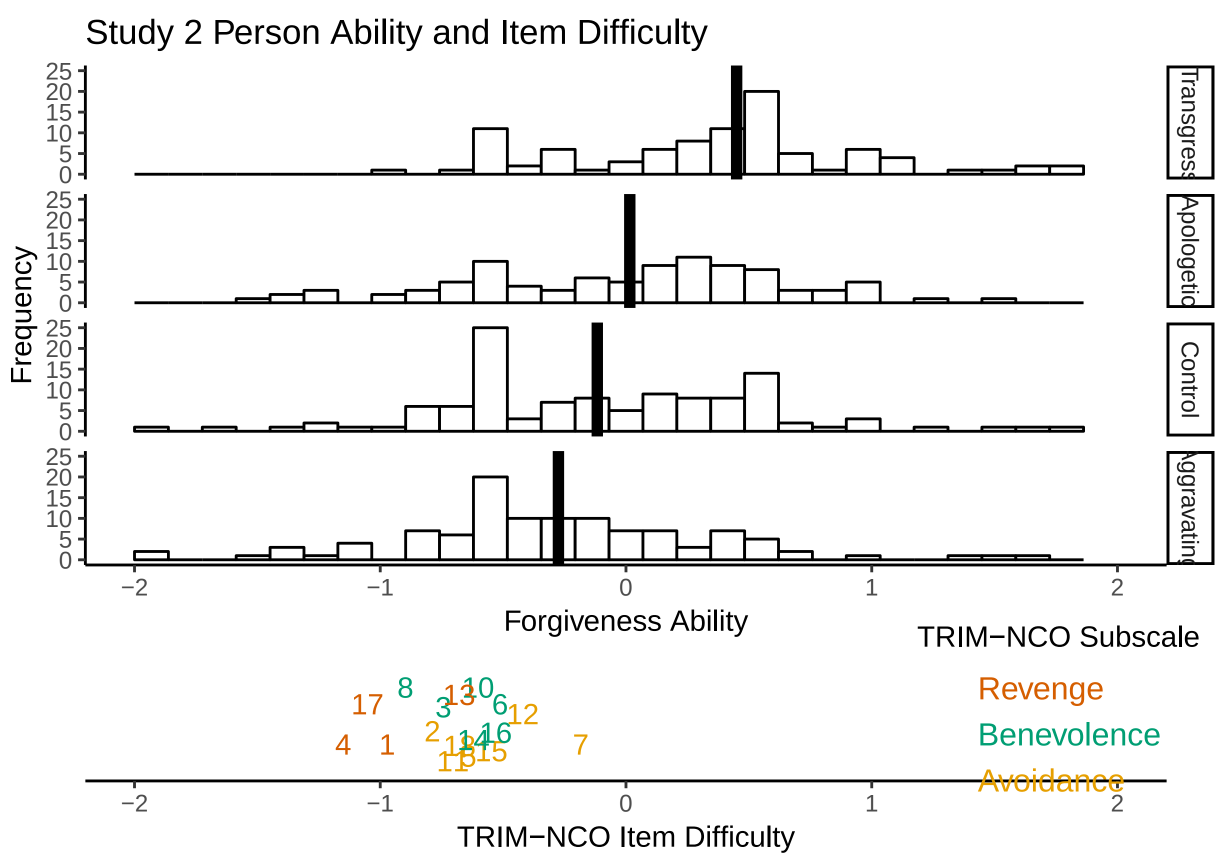
Effects of Apologies

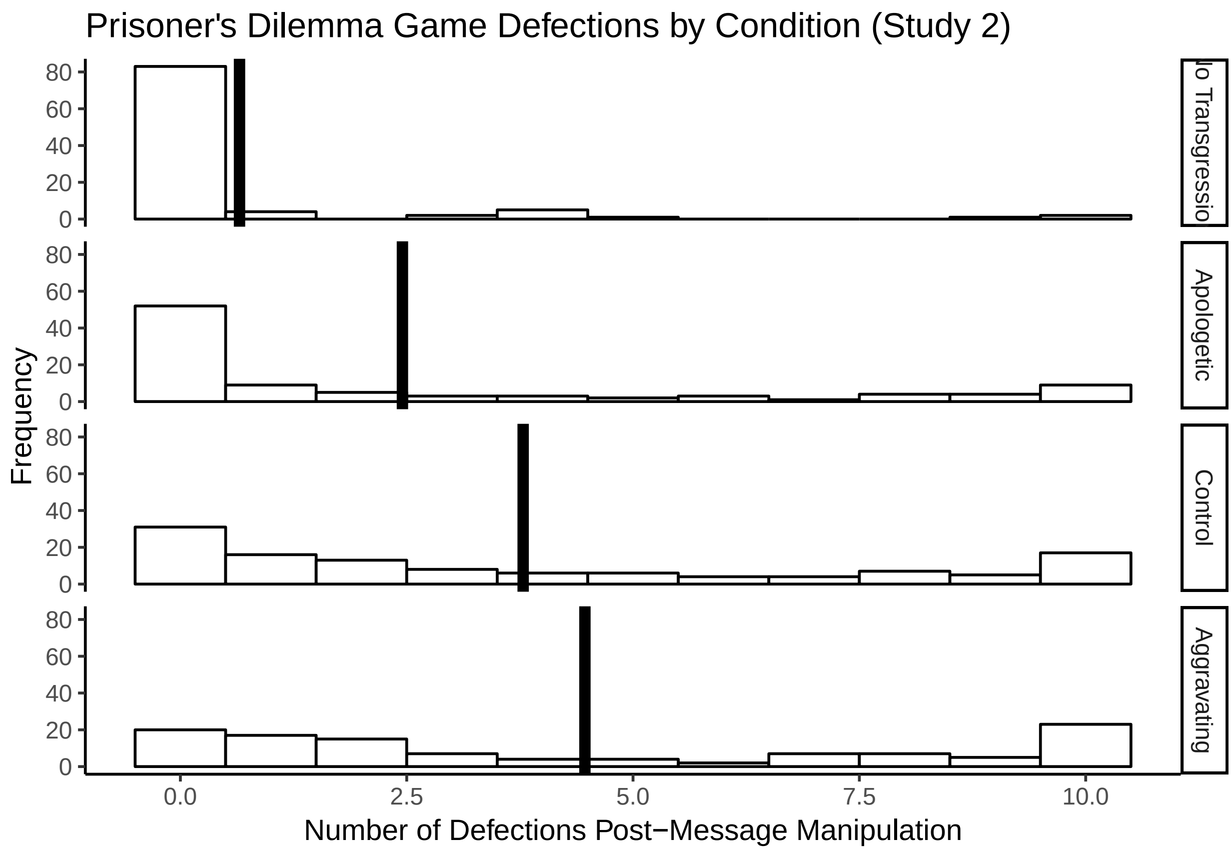
On All Outcomes

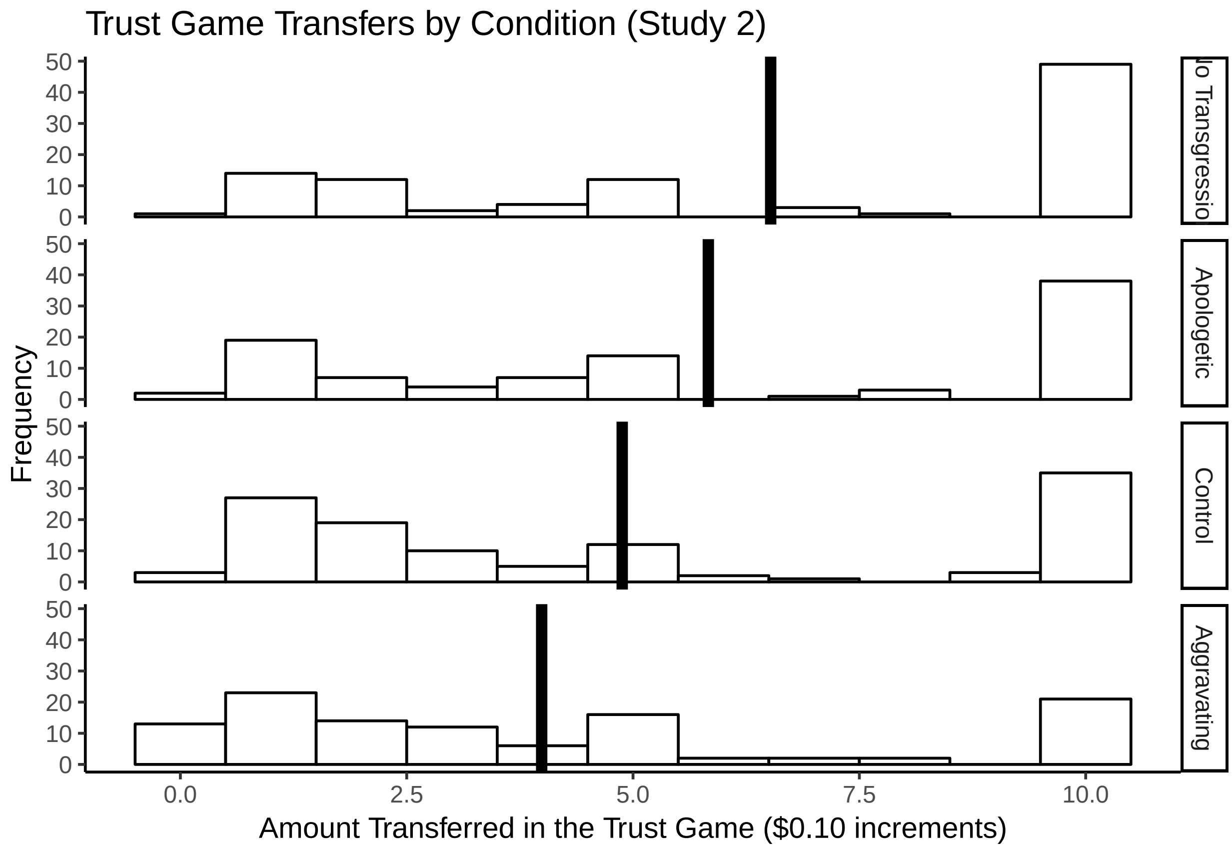
Table 20: Main Effects for Each Outcome (Study 2)

outcome	predictor	est	se	est_se	pval
GEN	Apologetic v. No Transgression	-0.704	0.163	-4.308	< .001
GEN	Control v. No Transgression	-0.884	0.162	-5.450	< .001
GEN	Aggravating v. Control	-1.157	0.164	-7.052	< .001
BENEV	Apologetic v. No Transgression	0.123	0.120	1.022	0.307
BENEV	Control v. No Transgression	-0.067	0.110	-0.608	0.543
BENEV	Aggravating v. Control	0.039	0.113	0.340	0.734
REVENGE	Apologetic v. No Transgression	0.080	0.242	0.330	0.741
REVENGE	Control v. No Transgression	-0.052	0.214	-0.241	0.809
REVENGE	Aggravating v. Control	0.211	0.238	0.887	0.375
PDG	Apologetic v. No Transgression	0.892	0.212	4.196	< .001
PDG	Control v. No Transgression	1.296	0.198	6.539	< .001
PDG	Aggravating v. Control	1.463	0.202	7.252	< .001
TG	Apologetic v. No Transgression	-0.689	0.525	-1.312	0.19
TG	Control v. No Transgression	-1.639	0.542	-3.026	0.002
TG	Aggravating v. Control	-2.529	0.601	-4.211	< .001

On Forgiveness Continuum




Prisoner's Dilemma Game Defections by Condition (Study 2)
Frequency
No Transgression
Apologetic
Control
Aggravating
0
20
40
60
80
0.0
2.5
5.0
7.5
10.0
Number of Defections Post−Message Manipulation


Trust Game Transfers by Condition (Study 2)
Frequency
o Transgressio
Apologetic
Control
Aggravating
0
10
20
30
40
50
0.0
2.5
5.0
7.5
10.0
Amount Transferred in the Trust Game ($0.10 increments)

On Convergent Validity

Table 21: Predictive Utility of General Factor Across Conditions (Study 2)

Group	outcome	predictor	est	se	est_se	pval
CT	***PDG***	***GEN***	***-1.052***	***0.455***	***-2.313***	***0.021***
CT	PDG	BENEV	0.602	0.478	1.259	0.208
CT	PDG	REVENGE	0.163	0.336	0.487	0.626
CT	***TG***	***GEN***	***1.892***	***0.709***	***2.669***	***0.008***
CT	TG	BENEV	0.668	1.260	0.530	0.596
CT	TG	REVENGE	-0.447	0.841	-0.532	0.595
AP	PDG	GEN	-0.328	0.190	-1.729	0.084
AP	PDG	BENEV	-0.779	0.405	-1.924	0.054
AP	***PDG***	***REVENGE***	***0.513***	***0.233***	***2.199***	***0.028***
AP	TG	GEN	-0.070	0.545	-0.129	0.897
AP	***TG***	***BENEV***	***3.689***	***1.545***	***2.388***	***0.017***
AP	***TG***	***REVENGE***	***-2.255***	***0.939***	***-2.402***	***0.016***
NE	***PDG***	***GEN***	***-0.506***	***0.162***	***-3.126***	***0.002***
NE	***PDG***	***BENEV***	***-0.875***	***0.373***	***-2.347***	***0.019***
NE	PDG	REVENGE	-0.393	0.218	-1.806	0.071
NE	TG	GEN	0.802	0.564	1.423	0.155
NE	TG	BENEV	0.725	1.268	0.572	0.567
NE	TG	REVENGE	-0.173	0.579	-0.300	0.765
AG	***PDG***	***GEN***	***-0.412***	***0.163***	***-2.527***	***0.012***
AG	PDG	BENEV	0.073	0.351	0.209	0.835
AG	PDG	REVENGE	-0.069	0.206	-0.334	0.738
AG	***TG***	***GEN***	***1.892***	***0.615***	***3.077***	***0.002***
AG	TG	BENEV	1.273	1.180	1.078	0.281
AG	TG	REVENGE	-0.324	0.686	-0.472	0.637

Study 3

Descriptive Statistics

Table 22: Descriptive Statistics in Study 3

Item	mean	sd
pdg	2.676667	3.3917255
tg	4.140000	3.4920454
trim1	1.650000	0.9257556
trim2	2.576667	1.1641764
trim3	3.250000	1.1037334
trim4	1.510000	0.8239111
trim5	2.576667	1.1021971
trim6	3.460000	1.0577315
trim7	2.723333	1.1739033
trim8	3.518395	1.0847460
trim9	1.720000	0.9650758
trim10	3.516667	1.0262714
trim11	2.533333	1.1662286
trim12	2.990000	1.0741256
trim13	1.660000	0.9525884
trim14	3.530000	1.0953383
trim15	2.676667	1.1874999
trim16	3.692308	1.1077705
trim17	1.613333	0.8943275
trim18	2.430000	1.1236735

Model Selection

Table 23: Model fit for alternative structures in Study 3

model	ChiSq (df), p	CFI	TLI	RMSEA [90% CI]
1factor	1379.874 (119), < .001	0.886	0.869	0.188 [0.179, 0.197]
2factor	833.641 (118), < .001	0.935	0.925	0.142 [0.133, 0.151]
3factor	705.36 (116), < .001	0.947	0.937	0.13 [0.121, 0.139]
bifactor	360.385 (108), < .001	0.977	0.971	0.088 [0.078, 0.098]

Invariance

Table 24: Invariance Across Conditions for Study 3

model	ChiSq (df), p	ChiSq diff	CFI	CFI_diff	TLI	RMSEA [90% CI]	SRMR
config	758.311 (348), < .001	NA	0.889	NA	0.870	0.109 [0.098, 0.119]	0.083
metric	809.918 (382), < .001	51.607 (34), 0.027	0.885	0.004	0.877	0.106 [0.096, 0.116]	0.123
scalar	845.494 (416), < .001	35.576 (34), 0.394	0.884	0.001	0.887	0.102 [0.092, 0.111]	0.135

Structural Equation Models

Table 25: Study 3 Regressions Using 3-Factor Congeneric Model

model	Outcome	Predictor	beta	se	z	pval
three-factor	PDG	AVOID	-0.050	0.154	-0.328	0.743
three-factor	PDG	REVENGE	0.022	0.111	0.198	0.843
three-factor	PDG	BENEV	-0.319	0.142	-2.246	0.025
three-factor	TG	AVOID	0.179	0.129	1.385	0.166
three-factor	TG	REVENGE	0.121	0.084	1.441	0.150
three-factor	TG	BENEV	-0.122	0.128	-0.950	0.342

Table 26: Study 3 Regressions Using Bifactor (S-1) Model

model	Outcome	Predictor	beta	se	z	pval
bifactor	PDG	GEN	-0.340	0.057	-5.951	$< .001$
bifactor	PDG	BENEV	-0.047	0.073	-0.651	0.515
bifactor	PDG	REVENGE	0.024	0.090	0.271	0.786
bifactor	TG	GEN	0.151	0.055	2.778	0.005
bifactor	TG	BENEV	-0.067	0.065	-1.031	0.302
bifactor	TG	REVENGE	0.099	0.068	1.455	0.146

Table 27: Study 3 Regressions Using Composite Scores

model	Outcome	Predictor	b	se	z	pval	beta
composite	TRIM_CMP	PDG	-0.197	0.044	-4.443	$< .001$	NA
composite	TRIM_CMP	G2_CHOICE	0.022	0.012	1.838	0.066	NA

Psychometrics

Table 28: Standardized Factor Loadings from Bifactor (S-1) in Study 3

paramHeader	param	est	se	est_se	pval
GEN.BY	TRIM7	0.834	0.019	43.492	$<.001$
GEN.BY	TRIM2	0.863	0.016	53.738	$<.001$
GEN.BY	TRIM5	0.880	0.013	66.854	$<.001$
GEN.BY	TRIM11	0.870	0.016	55.972	$<.001$
GEN.BY	TRIM12	0.869	0.016	55.333	$<.001$
GEN.BY	TRIM15	0.821	0.021	38.993	$<.001$
GEN.BY	TRIM18	0.835	0.019	44.625	$<.001$
GEN.BY	TRIM3	0.808	0.020	39.465	$<.001$
GEN.BY	TRIM6	0.560	0.036	15.725	$<.001$
GEN.BY	TRIM8	0.762	0.024	31.359	$<.001$
GEN.BY	TRIM10	0.768	0.023	33.671	$<.001$
GEN.BY	TRIM14	0.506	0.037	13.625	$<.001$
GEN.BY	TRIM16	0.452	0.043	10.512	$<.001$
GEN.BY	TRIM17	0.506	0.048	10.569	$<.001$
GEN.BY	TRIM1	0.541	0.046	11.707	$<.001$
GEN.BY	TRIM4	0.605	0.049	12.312	$<.001$
GEN.BY	TRIM13	0.516	0.047	10.939	$<.001$
BENEV.BY	TRIM3	0.186	0.037	5.002	$<.001$
BENEV.BY	TRIM6	0.484	0.036	13.448	$<.001$
BENEV.BY	TRIM8	0.254	0.043	5.931	$<.001$
BENEV.BY	TRIM10	0.253	0.041	6.132	$<.001$
BENEV.BY	TRIM14	0.686	0.030	22.840	$<.001$
BENEV.BY	TRIM16	0.770	0.038	20.460	$<.001$
REVENGE.BY	TRIM17	0.770	0.032	24.092	$<.001$
REVENGE.BY	TRIM1	0.704	0.035	19.891	$<.001$
REVENGE.BY	TRIM4	0.477	0.049	9.656	$<.001$
REVENGE.BY	TRIM13	0.765	0.035	21.741	$<.001$

Internal Consistency

McDonald's ω Hierarchical (General Factor): 0.882991

McDonald's ω Hierarchical Subscale (Benevolence Factor): 0.2919958

McDonald's ω Hierarchical Subscale (Revenge Factor): 0.5677023

Construct Reliability

"In contrast to omegaH and omegaHS values, which provide the correlation between a factor and a unit-weighted composite, H values provide the correlation between a factor and an optimally weighted item composite." (Rodriguez et al., p. 7)

General Factor: H = 0.9638507

Benevolence Factor: H = 0.7385226

Revenge Factor: H = 0.805618

"Hancock and Mueller (2001) have justified the need to meet a standard criterion of H = .70. . . " (ibid., p. 7)

By Hancock and Mueller's criterion, the general, benevolence, and revenge factors are represented well.

Explained Common Variance

"…simply because the data are more statistically consistent with a bifactor structure, for example, does not necessarily require that all the variables must be specified in a measurement model or that the more complex bifactor model even is necessary." (ibid., p. 7)

"We are not interested in the fitting of IRT models here, but rather in deciding whether to treat the multidimensional data with a bifactor structure as essentially unidimensional in an SEM measurement model." (ibid., p. 8)

ECV = 0.7252807, meaning that the general factor explains 0.7252807 of the common variance extracted with 0.2747193 spread across group factors.

Percent Uncontaminated Correlations

"To demonstrate the use of ECV and PUC, consider the MASC, with values of .80 and .77, respectively, on these indices. Under such conditions, we expect very little difference in the factor loadings between a unidimensional model and the general factor in a bifactor model." (ibid., p. 9)

PUC = 0.8455882

With our values of ECV and PUC being 0.725 and 0.846, respectively, we should also expect very little difference in the factor loadings between a unidimensional model and the general factor.

Average Parameter Bias

"We then computed the relative parameter bias as the difference between an item's loading in the unidimensional solution and its general factor loading in the bifactor (i.e., the truer model), divided by the general factor loading in the bifactor… According to Muthén, Kaplan, and Hollis (1987), parameter bias less than 10–15% is acceptable and poses no serious concern." (ibid., p. 9)

average bias = 0.1425996

"As a consequence, a unidimensional measurement model in the context of SEM well may suffice for the MASC, even though such a model would not provide a good statistical fit to the data." (ibid., p. 9)

Table 29: Item Discrimination, Thresholds, and Location Indices for Study 2

Item	subscale	a	b1	b2	b3	b4	LI_irf
TRIM4	REV	0.725	-2.475	-1.791	-1.175	-0.394	-1.4602826
TRIM17	REV	0.606	-2.128	-1.791	-1.008	-0.245	-1.2965258
TRIM1	REV	0.648	-2.128	-1.613	-1.008	-0.193	-1.2387636
TRIM13	REV	0.618	-2.054	-1.555	-0.994	-0.202	-1.2039320
TRIM16	BEN	0.542	-1.612	-1.093	-0.311	0.641	-0.5981014
TRIM18	AVO	1.001	-1.678	-0.941	-0.126	0.706	-0.5132313
TRIM10	BEN	0.920	-1.713	-1.036	-0.117	0.981	-0.4877876
TRIM14	BEN	0.606	-1.613	-0.967	-0.126	0.842	-0.4707783
TRIM8	BEN	0.914	-1.526	-1.006	-0.156	0.926	-0.4587132
TRIM6	BEN	0.672	-1.555	-0.954	-0.117	1.065	-0.4024097
TRIM11	AVO	1.043	-1.451	-0.842	-0.084	0.818	-0.4003804
TRIM5	AVO	1.055	-1.645	-0.866	0.059	0.878	-0.3952546
TRIM2	AVO	1.035	-1.527	-0.761	-0.017	0.830	-0.3719043
TRIM15	AVO	0.984	-1.428	-0.674	0.100	0.878	-0.2817854
TRIM7	AVO	1.000	-1.341	-0.706	0.151	0.967	-0.2383193
TRIM3	BEN	0.968	-1.405	-0.772	0.210	1.111	-0.2237659
TRIM12	AVO	1.041	-1.282	-0.573	0.593	1.301	0.0097912

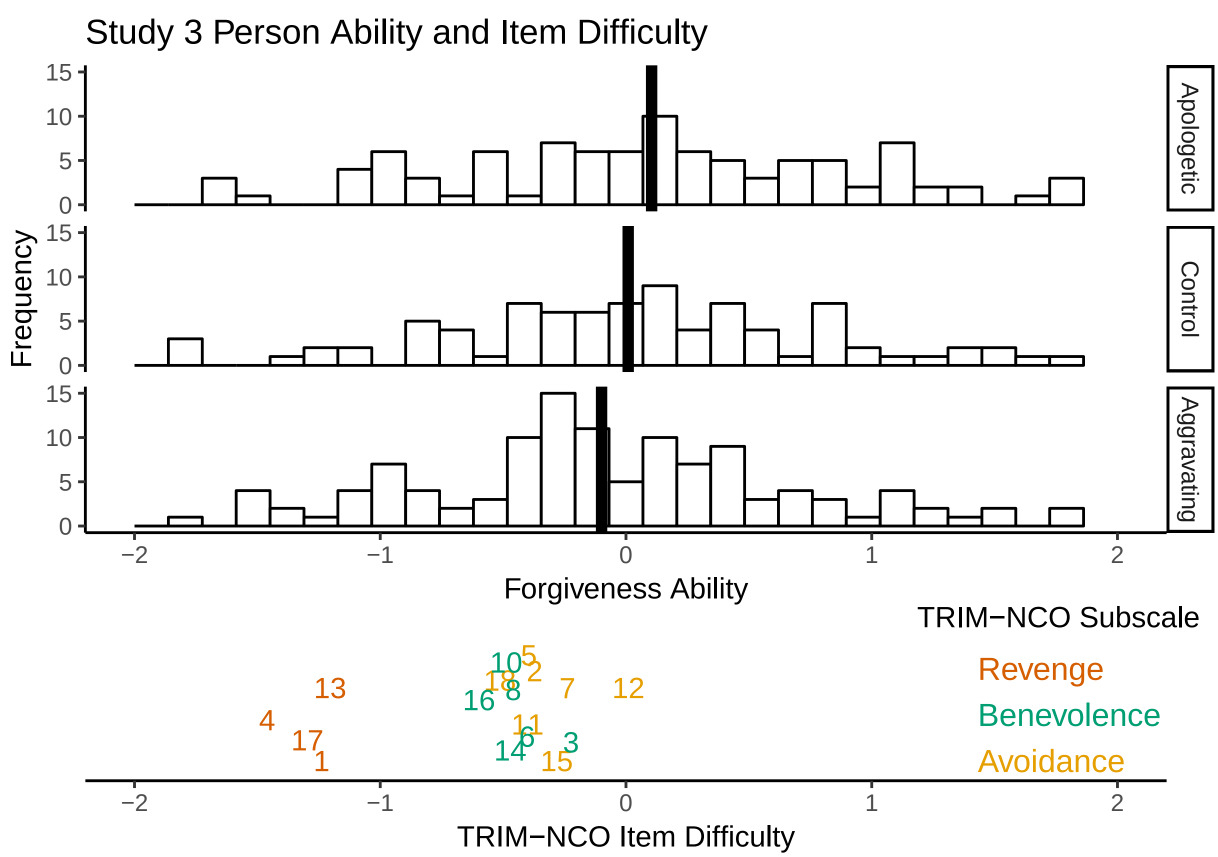
Effects of Apologies

On All Outcomes

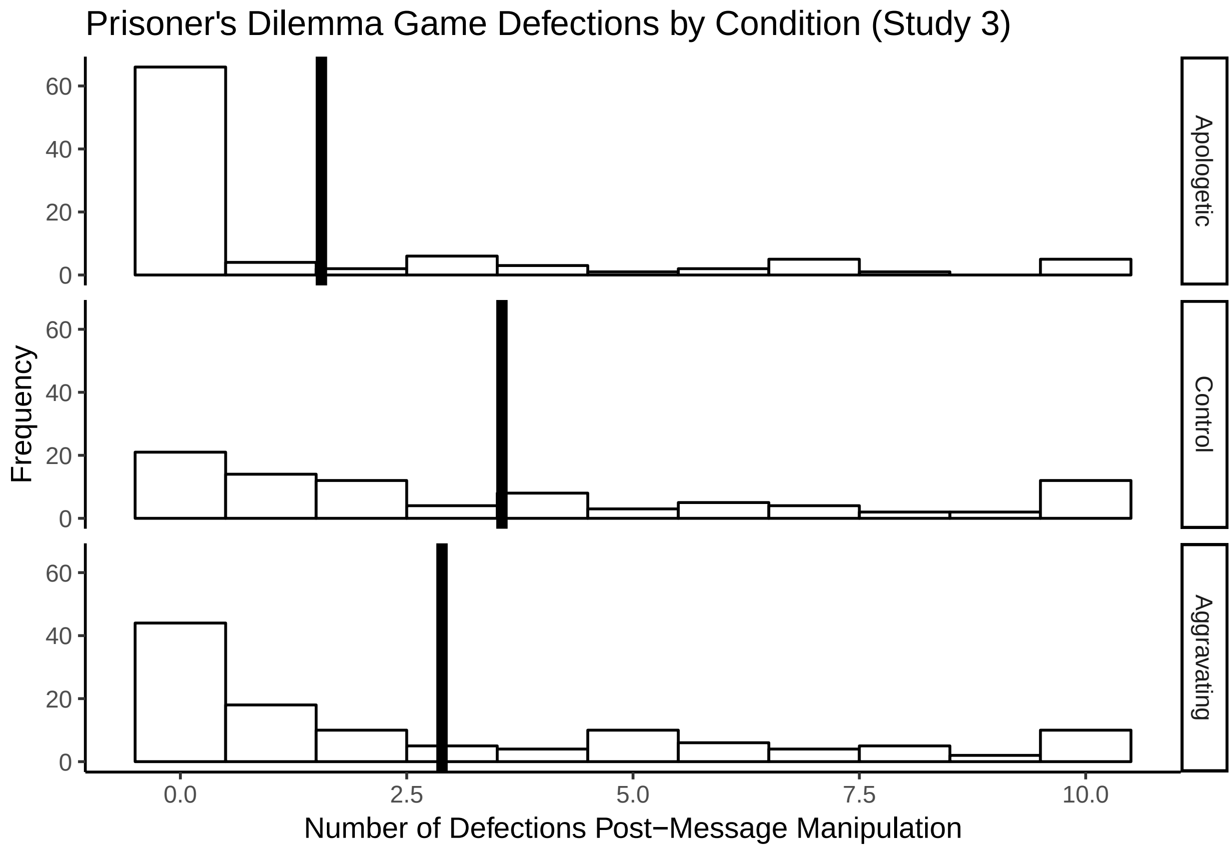
Table 30: Main Effects for Each Outcome (Study 3)

outcome	predictor	est	se	est_se	pval
GEN	Apologetic v. Control	0.180	0.233	0.772	0.44
GEN	Aggravating v. Control	-0.218	0.219	-0.995	0.32
BENEV	Apologetic v. Control	0.027	0.056	0.489	0.625
BENEV	Aggravating v. Control	0.025	0.054	0.459	0.646
REVENGE	Apologetic v. Control	0.239	0.364	0.657	0.511
REVENGE	Aggravating v. Control	-0.114	0.353	-0.324	0.746
PDG	Apologetic v. Control	-0.644	0.181	-3.558	< .001
PDG	Aggravating v. Control	-0.172	0.159	-1.079	0.281
TG	Apologetic v. Control	0.672	0.529	1.272	0.204
TG	Aggravating v. Control	0.692	0.505	1.372	0.17

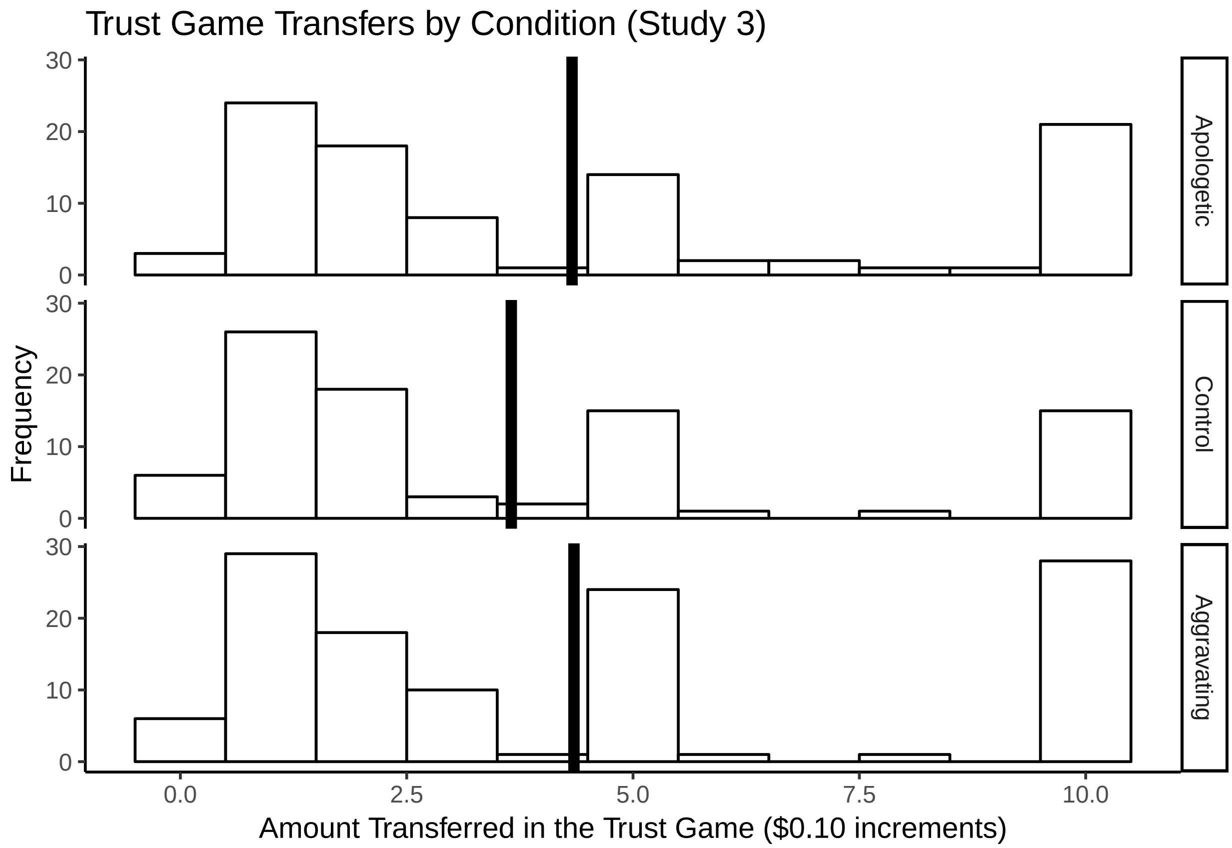
On Forgiveness Continuum



On Economic Game Decisions



Prisoner's Dilemma Game Defections by Condition (Study 3)
Frequency
60
40
20
0
Apologetic
Control
Aggravating
0.0
2.5
5.0
7.5
10.0
Number of Defections Post−Message Manipulation



Trust Game Transfers by Condition (Study 3)
Frequency
30
20
10
0
Apologetic
Control
Aggravating
0.0
2.5
5.0
7.5
10.0
Amount Transferred in the Trust Game ($0.10 increments)

On Convergent Validity

Table 31: Predictive Utility of General Factor Across Conditions (Study 2)

Group	outcome	predictor	est	se	est_se	pval
AP	PDG	GEN	-0.329	0.170	-1.931	0.054
AP	PDG	BENEV	-0.241	1.063	-0.227	0.821
AP	PDG	REVENGE	-0.040	0.276	-0.143	0.886
AP	TG	GEN	0.180	0.430	0.418	0.676
AP	TG	BENEV	-3.646	2.515	-1.449	0.147
AP	TG	REVENGE	0.321	0.648	0.495	0.621
NE	***PDG***	***GEN***	***-0.480***	***0.161***	***-2.985***	***0.003***
NE	PDG	BENEV	-0.381	0.983	-0.387	0.699
NE	PDG	REVENGE	0.255	0.223	1.147	0.251
NE	TG	GEN	0.440	0.458	0.962	0.336
NE	TG	BENEV	3.229	2.418	1.335	0.182
NE	TG	REVENGE	-0.817	0.603	-1.355	0.176
AG	***PDG***	***GEN***	***-0.398***	***0.128***	***-3.101***	***0.002***
AG	PDG	BENEV	-0.335	0.701	-0.477	0.633
AG	PDG	REVENGE	-0.180	0.175	-1.027	0.304
AG	***TG***	***GEN***	***1.361***	***0.432***	***3.150***	***0.002***
AG	TG	BENEV	-2.175	2.044	-1.064	0.287
AG	***TG***	***REVENGE***	***1.430***	***0.582***	***2.456***	***0.014***

Study 4

(REV) 1. I'll make him or her pay. (AVO) 2. I am trying to keep as much distance between us as possible. (BEN) 3. Even though his/her actions have hurt me, I have good will for him/her. (REV) 4. I wish that something bad would happen to him/her. (AVO) 5. I am living as if he/she doesn't exist, isn't around. (BEN) 6. I want us to bury the hatchet and move forward with our relationship. (AVO) 7. I don't trust him/her. (BEN) 8. Despite what he/she did, I want us to have a positive relationship. (REV) 9. I want him/her to get what he/she deserves. (BEN) 10. I am finding it difficult to act warmly towards him/her. (AVO) 11. I am avoiding him/her. (BEN) 12. Although he/she hurt me, I am putting the hurt aside so we can resume our relationship. (REV) 13. I'm going to get even. (BEN) 14. I have given up my hurt and resentment. (AVO) 15. I cut off the relationship with him/her. (BEN) 16. I have released my anger so I can work on restoring our relationship to health. (REV) 17. I want to see him or her hurt and miserable. (AVO) 18. I withdraw from him/her.

Model Selection

Table 32: Model fit for alternative structures in Study 4

model	ChiSq (df), p	CFI	TLI	RMSEA [90% CI]
1factor	777.548 (135), < .001	0.926	0.916	0.168 [0.157, 0.18]
2factor	305.932 (134), < .001	0.980	0.977	0.087 [0.074, 0.1]
3factor	271.662 (132), < .001	0.984	0.981	0.079 [0.066, 0.093]
bifactor	261.947 (123), < .001	0.984	0.980	0.082 [0.068, 0.096]

Structural Equation Models

Table 33: Study 4 Regressions Using 3-Factor Congeneric Model

model	Outcome	Predictor	beta	se	z	pval
three-factor	Self-Report Forgiveness	AVOID	0.072	0.187	0.387	0.699
three-factor	Self-Report Forgiveness	BENEV	0.382	0.167	2.293	0.022
three-factor	Self-Report Forgiveness	REVENGE	0.250	0.091	2.768	0.006

Table 34: Study 4 Regressions Using Bifactor (S-1) Model

model	Outcome	Predictor	beta	se	z	pval
bifactor	Self-Report Forgiveness	GEN	0.582	0.060	9.652	$< .001$
bifactor	Self-Report Forgiveness	REVENGE	0.144	0.113	1.276	0.202
bifactor	Self-Report Forgiveness	BENEV	-0.044	0.103	-0.432	0.666

Table 35: Study 4 Regressions Using Composite Scores

model	Outcome	Predictor	beta	se	z	pval
composite	Self-Report Forgiveness	COMP	0.586	0.051	11.55	$< .001$

Psychometrics

Table 36: Standardized Factor Loadings from Bifactor (3-1) in Study 4

paramHeader	param	est	se	est_se	pval
GEN.BY	TRIM_2	0.929	0.014	67.799	< .001
GEN.BY	TRIM_5	0.888	0.020	45.137	< .001
GEN.BY	TRIM_7	0.791	0.031	25.763	< .001
GEN.BY	TRIM_10	0.796	0.030	26.754	< .001
GEN.BY	TRIM_11	0.888	0.018	48.209	< .001
GEN.BY	TRIM_12	0.823	0.030	27.435	< .001
GEN.BY	TRIM_15	0.898	0.017	51.781	< .001
GEN.BY	TRIM_18	0.862	0.023	37.621	< .001
GEN.BY	TRIM_3	0.778	0.036	21.594	< .001
GEN.BY	TRIM_6	0.838	0.029	28.778	< .001
GEN.BY	TRIM_8	0.847	0.029	29.664	< .001
GEN.BY	TRIM_14	0.571	0.051	11.128	< .001
GEN.BY	TRIM_16	0.773	0.037	20.660	< .001
GEN.BY	TRIM_1	0.362	0.097	3.736	< .001
GEN.BY	TRIM_4	0.571	0.054	10.639	< .001
GEN.BY	TRIM_9	0.283	0.074	3.850	< .001
GEN.BY	TRIM_13	0.428	0.087	4.892	< .001
GEN.BY	TRIM_17	0.513	0.075	6.828	< .001
BENEV.BY	TRIM_3	-0.006	0.086	-0.066	0.947
BENEV.BY	TRIM_6	0.441	0.057	7.774	< .001
BENEV.BY	TRIM_8	0.347	0.065	5.348	< .001
BENEV.BY	TRIM_12	0.315	0.046	6.795	< .001
BENEV.BY	TRIM_14	-0.136	0.097	-1.403	0.161
BENEV.BY	TRIM_16	0.245	0.064	3.852	< .001
REVENGE.BY	TRIM_1	0.794	0.048	16.505	< .001
REVENGE.BY	TRIM_4	0.752	0.048	15.723	< .001
REVENGE.BY	TRIM_9	0.648	0.061	10.622	< .001
REVENGE.BY	TRIM_13	0.774	0.052	14.880	< .001
REVENGE.BY	TRIM_17	0.757	0.053	14.220	< .001

Internal Consistency

McDonald's ω Hierarchical (General Factor): 0.8956307

McDonald's ω Hierarchical Subscale (Benevolence Factor): 0.0635365

McDonald's ω Hierarchical Subscale (Revenge Factor): 0.7488892

Construct Reliability

"In contrast to omegaH and omegaHS values, which provide the correlation between a factor and a unit-weighted composite, H values provide the correlation between a factor and an optimally weighted item composite." (Rodriguez et al., p. 7)

General Factor: H = 0.9729868

Benevolence Factor: H = 0.3635525

Revenge Factor: H = 0.8678593

"Hancock and Mueller (2001) have justified the need to meet a standard criterion of H = .70…" (ibid., p. 7)

By Hancock and Mueller's criterion, the general and revenge factors are represented well, but the benevolence factor is not specified reliably.

Explained Common Variance

"...simply because the data are more statistically consistent with a bifactor structure, for example, does not necessarily require that all the variables must be specified in a measurement model or that the more complex bifactor model even is necessary." (ibid., p. 7)

"We are not interested in the fitting of IRT models here, but rather in deciding whether to treat the multidimensional data with a bifactor structure as essentially unidimensional in an SEM measurement model." (ibid., p. 8)

ECV = 0.7586168, meaning that the general factor explains 0.7586168 of the common variance extracted with 0.2413832 spread across group factors.

Percent Uncontaminated Correlations

"To demonstrate the use of ECV and PUC, consider the MASC, with values of .80 and .77, respectively, on these indices. Under such conditions, we expect very little difference in the factor loadings between a unidimensional model and the general factor in a bifactor model." (ibid., p. 9)

PUC = 0.8366013

With our values of ECV and PUC being 0.759 and 0.837, respectively, we should also expect very little difference in the factor loadings between a unidimensional model and the general factor.

Average Parameter Bias

"We then computed the relative parameter bias as the difference between an item's loading in the unidimensional solution and its general factor loading in the bifactor (i.e., the truer model), divided by the general factor loading in the bifactor... According to Muthén, Kaplan, and Hollis (1987), parameter bias less than 10–15% is acceptable and poses no serious concern." (ibid., p. 9)

average bias = 0.1687182

Data derived from Study 4 may be problematic, in terms of parameter bias, if we were to fit a unidimensional, rather than bifactor, model.

Study 5

Model Selection

Table 37: Model fit for alternative structures in Study 5

model	ChiSq (df), p	CFI	TLI	RMSEA [90% CI]
1factor	898.322 (135), < .001	0.881	0.865	0.189 [0.178, 0.201]
2factor	466.095 (134), < .001	0.948	0.941	0.125 [0.113, 0.138]
3factor	447.372 (132), < .001	0.951	0.943	0.123 [0.111, 0.136]
bifactor	389.809 (123), < .001	0.958	0.948	0.117 [0.104, 0.13]

Structural Equation Models

Table 38: Study 5 Regressions Using 3-Factor Congeneric Model

model	Outcome	Predictor	beta	se	z	pval
three-factor	Self-Report Forgiveness	AVOID	-0.421	0.175	-2.409	0.016
three-factor	Self-Report Forgiveness	BENEV	0.807	0.179	4.499	$< .001$
three-factor	Self-Report Forgiveness	REVENGE	0.307	0.067	4.588	$< .001$

Table 39: Study 5 Regressions Using Bifactor (S-1) Model

model	Outcome	Predictor	beta	se	z	pval
bifactor	Self-Report Forgiveness	GEN	0.539	0.063	8.521	$< .001$
bifactor	Self-Report Forgiveness	REVENGE	0.198	0.055	3.634	$< .001$
bifactor	Self-Report Forgiveness	BENEV	0.178	0.055	3.243	0.001

Table 40: Study 5 Regressions Using Composite Scores

model	Outcome	Predictor	beta	se	z	pval
composite	Self-Report Forgiveness	COMP	0.589	0.052	11.356	$< .001$

Psychometrics

Table 41: Standardized Factor Loadings from Bifactor (3-1) in Study 5

paramHeader	param	est	se	est_se	pval
GEN.BY	TRIM_2	0.861	0.027	31.967	< .001
GEN.BY	TRIM_5	0.763	0.041	18.740	< .001
GEN.BY	TRIM_7	0.818	0.031	26.820	< .001
GEN.BY	TRIM_10	0.800	0.033	24.483	< .001
GEN.BY	TRIM_11	0.859	0.024	36.133	< .001
GEN.BY	TRIM_12	0.860	0.023	37.200	< .001
GEN.BY	TRIM_15	0.807	0.034	23.728	< .001
GEN.BY	TRIM_18	0.923	0.016	57.922	< .001
GEN.BY	TRIM_3	0.705	0.042	16.868	< .001
GEN.BY	TRIM_6	0.810	0.033	24.879	< .001
GEN.BY	TRIM_8	0.856	0.027	31.998	< .001
GEN.BY	TRIM_14	0.703	0.043	16.465	< .001
GEN.BY	TRIM_16	0.804	0.033	24.549	< .001
GEN.BY	TRIM_1	0.342	0.092	3.713	< .001
GEN.BY	TRIM_4	0.608	0.058	10.445	< .001
GEN.BY	TRIM_9	0.405	0.072	5.604	< .001
GEN.BY	TRIM_13	0.383	0.083	4.638	< .001
GEN.BY	TRIM_17	0.594	0.064	9.343	< .001
BENEV.BY	TRIM_3	0.055	0.064	0.857	0.391
BENEV.BY	TRIM_6	0.402	0.052	7.728	< .001
BENEV.BY	TRIM_8	0.365	0.055	6.635	< .001
BENEV.BY	TRIM_12	0.049	0.048	1.020	0.308
BENEV.BY	TRIM_14	-0.422	0.074	-5.670	< .001
BENEV.BY	TRIM_16	-0.304	0.058	-5.276	< .001
REVENGE.BY	TRIM_1	0.842	0.039	21.331	< .001
REVENGE.BY	TRIM_4	0.670	0.049	13.702	< .001
REVENGE.BY	TRIM_9	0.790	0.039	20.200	< .001
REVENGE.BY	TRIM_13	0.877	0.040	21.684	< .001
REVENGE.BY	TRIM_17	0.734	0.047	15.539	< .001

Internal Consistency

McDonald's ω Hierarchical (General Factor): 0.8965157

McDonald's ω Hierarchical Subscale (Benevolence Factor): 9.3570582×10^{-4}

McDonald's ω Hierarchical Subscale (Revenge Factor): 0.7379143

Construct Reliability

"In contrast to omegaH and omegaHS values, which provide the correlation between a factor and a unit-weighted composite, H values provide the correlation between a factor and an optimally weighted item composite." (Rodriguez et al., p. 7)

General Factor: H = 0.9691458

Benevolence Factor: H = 0.4013383

Revenge Factor: H = 0.9039414

"Hancock and Mueller (2001) have justified the need to meet a standard criterion of H = .70. . . " (ibid., p. 7)

By Hancock and Mueller's criterion, the general and revenge factors are represented well, but the benevolence factor is not specified reliably.

Explained Common Variance

"…simply because the data are more statistically consistent with a bifactor structure, for example, does not necessarily require that all the variables must be specified in a measurement model or that the more complex bifactor model even is necessary." (ibid., p. 7)

"We are not interested in the fitting of IRT models here, but rather in deciding whether to treat the multidimensional data with a bifactor structure as essentially unidimensional in an SEM measurement model." (ibid., p. 8)

ECV = 0.7586168, meaning that the general factor explains 0.7586168 of the common variance extracted with 0.2413832 spread across group factors.

Percent Uncontaminated Correlations

"To demonstrate the use of ECV and PUC, consider the MASC, with values of .80 and .77, respectively, on these indices. Under such conditions, we expect very little difference in the factor loadings between a unidimensional model and the general factor in a bifactor model." (ibid., p. 9)

PUC = 0.8366013

With our values of ECV and PUC being 0.759 and 0.837, respectively, we should also expect very little difference in the factor loadings between a unidimensional model and the general factor.

Average Parameter Bias

"We then computed the relative parameter bias as the difference between an item's loading in the unidimensional solution and its general factor loading in the bifactor (i.e., the truer model), divided by the general factor loading in the bifactor… According to Muthén, Kaplan, and Hollis (1987), parameter bias less than 10–15% is acceptable and poses no serious concern." (ibid., p. 9)

average bias = 0.2174597

Data derived from Study 5 may be problematic, in terms of parameter bias, if we were to fit a unidimensional, rather than bifactor, model.

Comparing/Combining Studies 1-3

Invariance

We tested for measurement invariance across studies.

Table 42: Invariance Across Laboratories (Studies 1-3)

model	ChiSq (df), p	ChiSq diff	CFI	CFI_diff	TLI	RMSEA [90% CI]	SRMR
config	1899.464 (348), < .001	NA	0.955	NA	0.947	0.072 [0.069, 0.075]	0.045
metric	2182.72 (382), < .001	283.256 (34), < .001	0.948	0.007	0.944	0.074 [0.071, 0.077]	0.211
scalar	2563.239 (410), < .001	380.519 (28), < .001	0.938	0.010	0.938	0.078 [0.075, 0.081]	0.212

We also examined mean differences for latent scores across the three samples:

Table 43: Standardized Mean Differences in Latent Variables Across Studies

paramHeader	param	est	se	est_se	pval	Group
Means	GEN	0.000	0.000	999.000	999.000	U.S. - Online
Means	BENEV	0.000	0.000	999.000	999.000	U.S. - Online
Means	REVENGE	0.000	0.000	999.000	999.000	U.S. - Online
Means	GEN	0.204	0.082	2.489	0.013	U.S. - Student/Community
Means	BENEV	-0.248	0.145	-1.712	0.087	U.S. - Student/Community
Means	REVENGE	-0.873	0.093	-9.349	0.000	U.S. - Student/Community
Means	GEN	0.104	0.091	1.140	0.254	Japan - Online
Means	BENEV	-0.293	0.116	-2.532	0.011	Japan - Online
Means	REVENGE	0.063	0.127	0.495	0.620	Japan - Online

Although there is significantly higher levels on the general factor for Experiment 2, this is due to the presence of the "no-transgression", which caused much higher levels of forgiveness. Upon removing this condition, there were no longer differences in the general factor across conditions:

Table 44: Standardized Mean Differences in Latent Variables Across Studies

paramHeader	param	est	se	est_se	pval	Group
Means	GEN	0.000	0.000	999.000	999.000	U.S. - Online
Means	BENEV	0.000	0.000	999.000	999.000	U.S. - Online
Means	REVENGE	0.000	0.000	999.000	999.000	U.S. - Online
Means	GEN	0.123	0.091	1.358	0.174	U.S. - Student/Community
Means	BENEV	-0.221	0.166	-1.325	0.185	U.S. - Student/Community
Means	REVENGE	-0.887	0.106	-8.361	0.000	U.S. - Student/Community
Means	GEN	0.104	0.091	1.144	0.253	Japan - Online
Means	BENEV	-0.296	0.116	-2.543	0.011	Japan - Online
Means	REVENGE	0.061	0.124	0.493	0.622	Japan - Online

Psychometrics

Internal Consistency

McDonald's ω Hierarchical (General Factor): 0.910032

Table 45: Standardized Factor Loadings from Bifactor (S-1) for Studies 1-3 Combined

paramHeader	param	est	se	est_se	pval
GEN.BY	TRIM7	0.804	0.007	110.580	$< .001$
GEN.BY	TRIM2	0.902	0.004	210.825	$< .001$
GEN.BY	TRIM5	0.906	0.004	222.324	$< .001$
GEN.BY	TRIM11	0.914	0.004	233.478	$< .001$
GEN.BY	TRIM12	0.874	0.005	168.237	$< .001$
GEN.BY	TRIM15	0.901	0.004	217.534	$< .001$
GEN.BY	TRIM18	0.918	0.004	252.015	$< .001$
GEN.BY	TRIM3	0.755	0.009	87.467	$< .001$
GEN.BY	TRIM6	0.757	0.008	90.427	$< .001$
GEN.BY	TRIM8	0.789	0.008	102.969	$< .001$
GEN.BY	TRIM10	0.787	0.008	102.935	$< .001$
GEN.BY	TRIM14	0.508	0.014	36.795	$< .001$
GEN.BY	TRIM16	0.493	0.014	34.255	$< .001$
GEN.BY	TRIM17	0.504	0.017	30.293	$< .001$
GEN.BY	TRIM1	0.525	0.015	33.963	$< .001$
GEN.BY	TRIM4	0.472	0.019	25.164	$< .001$
GEN.BY	TRIM13	0.476	0.016	29.817	$< .001$
BENEV.BY	TRIM3	0.341	0.012	28.109	$< .001$
BENEV.BY	TRIM6	0.319	0.011	28.904	$< .001$
BENEV.BY	TRIM8	0.292	0.012	25.091	$< .001$
BENEV.BY	TRIM10	0.306	0.012	25.725	$< .001$
BENEV.BY	TRIM14	0.612	0.013	48.485	$< .001$
BENEV.BY	TRIM16	0.670	0.013	50.610	$< .001$
REVENGE.BY	TRIM17	0.757	0.011	71.244	$< .001$
REVENGE.BY	TRIM1	0.721	0.010	73.073	$< .001$
REVENGE.BY	TRIM4	0.682	0.013	54.024	$< .001$
REVENGE.BY	TRIM13	0.751	0.010	77.157	$< .001$

McDonald's ω Hierarchical Subscale (Benevolence Factor): 0.2782698

McDonald's ω Hierarchical Subscale (Revenge Factor): 0.6843493

Construct Reliability

"In contrast to omegaH and omegaHS values, which provide the correlation between a factor and a unit-weighted composite, H values provide the correlation between a factor and an optimally weighted item composite." (Rodriguez et al., p. 7)

General Factor: H = 0.973454

Benevolence Factor: H = 0.6496031

Revenge Factor: H = 0.8210454

"Hancock and Mueller (2001) have justified the need to meet a standard criterion of H = .70…" (ibid., p. 7)

By Hancock and Mueller's criterion, the general and revenge factors are represented well, but the benevolence factor is not specified reliably.

Explained Common Variance

"…simply because the data are more statistically consistent with a bifactor structure, for example, does not necessarily require that all the variables must be specified in a measurement model or that the more complex bifactor model even is necessary." (ibid., p. 7)

"We are not interested in the fitting of IRT models here, but rather in deciding whether to treat the multidimensional data with a bifactor structure as essentially unidimensional in an SEM measurement model." (ibid., p. 8)

ECV = 0.7377285, meaning that the general factor explains 0.7377285 of the common variance extracted with 0.2622715 spread across group factors.

Percent Uncontaminated Correlations

"To demonstrate the use of ECV and PUC, consider the MASC, with values of .80 and .77, respectively, on these indices. Under such conditions, we expect very little difference in the factor loadings between a unidimensional model and the general factor in a bifactor model." (ibid., p. 9)

PUC = 0.8366013

With our values of ECV and PUC being 0.738 and 0.837, respectively, we should also expect very little difference in the factor loadings between a unidimensional model and the general factor.

Average Parameter Bias

"We then computed the relative parameter bias as the difference between an item's loading in the unidimensional solution and its general factor loading in the bifactor (i.e., the truer model), divided by the general factor loading in the bifactor... According to Muthén, Kaplan, and Hollis (1987), parameter bias less than 10–15% is acceptable and poses no serious concern." (ibid., p. 9)

average bias = 0.1609316

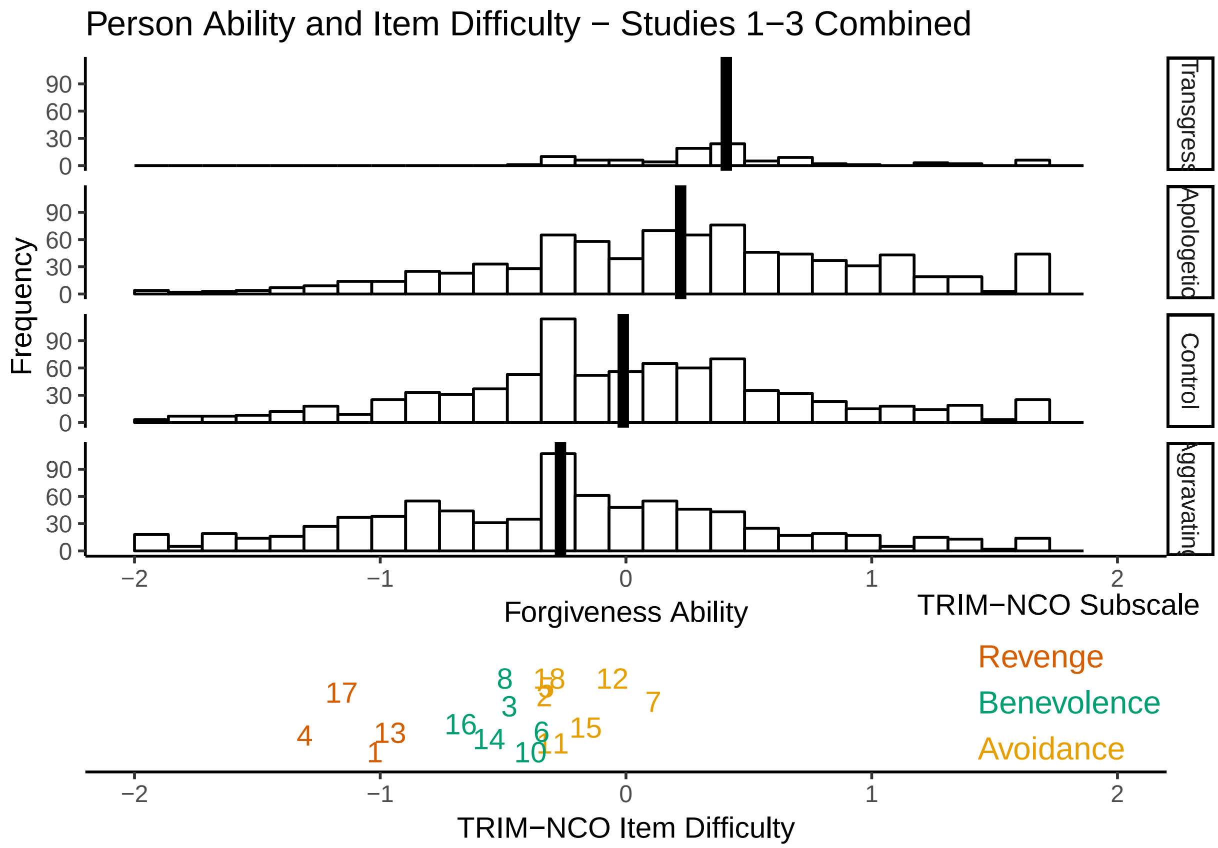
Data derived from Study 5 may be problematic, in terms of parameter bias, if we were to fit a unidimensional, rather than bifactor, model.

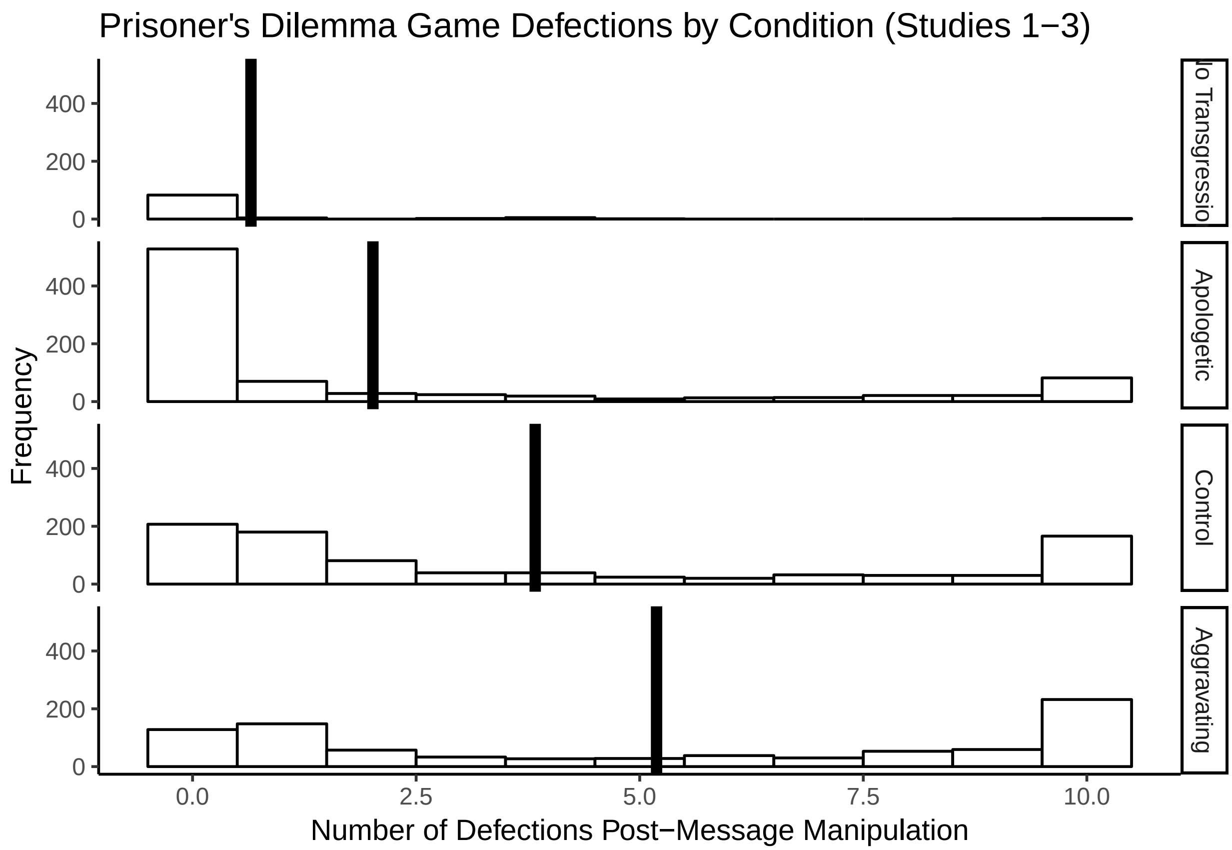
Table 46: Item Discrimination, Thresholds, and Location Indices for Studies 1-3

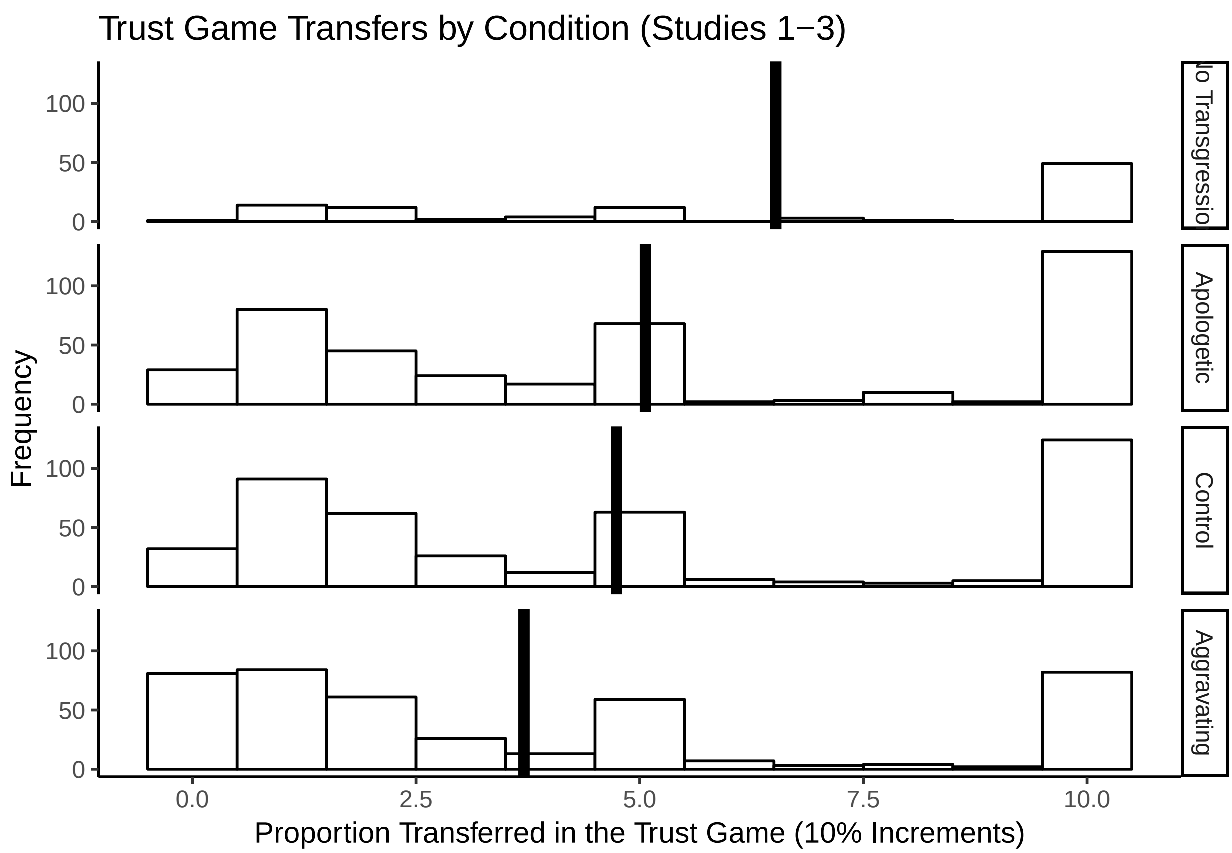
Item	subscale	a	b1	b2	b3	b4	LI_irf	Mean
TRIM4	REV	0.587	-2.160	-1.687	-1.013	-0.364	-1.3073082	1.574673
TRIM17	REV	0.627	-2.061	-1.529	-0.874	-0.158	-1.1572738	1.710820
TRIM1	REV	0.653	-1.940	-1.384	-0.741	-0.014	-1.0215928	1.833269
TRIM13	REV	0.592	-1.979	-1.298	-0.646	0.083	-0.9604943	1.913261
TRIM16	BEN	0.614	-1.652	-1.159	-0.362	0.501	-0.6722865	3.777050
TRIM14	BEN	0.632	-1.625	-1.082	-0.212	0.712	-0.5571733	3.630686
TRIM8	BEN	0.981	-1.560	-1.001	-0.206	0.872	-0.4929456	3.555513
TRIM3	BEN	0.940	-1.570	-0.989	-0.097	0.796	-0.4747238	3.531972
TRIM10	BEN	0.980	-1.498	-0.895	-0.051	0.947	-0.3887791	3.439692
TRIM6	BEN	0.942	-1.475	-0.814	-0.004	0.959	-0.3438667	3.392678
TRIM2	AVO	1.122	-1.336	-0.760	-0.010	0.812	-0.3326221	2.601930
TRIM5	AVO	1.128	-1.321	-0.742	-0.007	0.806	-0.3246310	2.609164
TRIM18	AVO	1.142	-1.294	-0.692	-0.040	0.815	-0.3124109	2.618938
TRIM11	AVO	1.138	-1.278	-0.665	-0.033	0.817	-0.2986781	2.633667
TRIM15	AVO	1.122	-1.140	-0.509	0.106	0.912	-0.1639331	2.793608
TRIM12	AVO	1.088	-1.232	-0.560	0.373	1.228	-0.0557670	3.067770
TRIM7	AVO	1.000	-0.967	-0.262	0.471	1.206	0.1110735	3.130535
TRIM9	NA	NA	NA	NA	NA	NA	NA	2.478194

Effects of Apologies

On Forgiveness Continuum




Prisoner's Dilemma Game Defections by Condition (Studies 1−3)
Frequency
400
200
0
No Transgressio
Apologetic
Control
Aggravating
0.0
2.5
5.0
7.5
10.0
Number of Defections Post−Message Manipulation


Trust Game Transfers by Condition (Studies 1−3)
Frequency
100
50
0
No Transgression
Apologetic
Control
Aggravating
0.0
2.5
5.0
7.5
10.0
Proportion Transferred in the Trust Game (10% Increments)

Studies 4 & 5

Invariance

Due to the limited sample sizes of Studies 4 & 5, we had trouble estimating configural and metric invariance with categorical indicators, due to the issue of estimating too many threshold parameters for the sample size. Therefore, we tested invariance by treating indicators as continuous. Due to the poor model fit of the initial configural model, we added correlations among indicators as suggested by Mplus's Modification Indices. This enabled us to test for a reduction in model fit after adding constraints.

Finally, we fit a scalar invariant model with categorical indicators, which yielded adequate model-data fit.

Table 47: Invariance Across Laboratories (Studies 4 and 5)

model	ChiSq (df), p	ChiSq diff	CFI	CFI_diff	TLI	RMSEA [90% CI]	SRMR
config	475.745 (242), < .001	NA	0.947	NA	0.933	0.077 [0.067, 0.087]	0.064
metric	529.875 (260), < .001	54.13 (18), < .001	0.939	0.008	0.928	0.08 [0.07, 0.09]	0.194
scalar	596.288 (272), < .001	66.413 (12), < .001	0.927	0.012	0.918	0.086 [0.076, 0.095]	0.087
scalar_grm	766.602 (323), < .001	170.314 (51), < .001	0.964	-0.037	0.966	0.092 [0.083, 0.1]	NA

Model Selection

Psychometrics

Table 48: Standardized Factor Loadings from Bifactor (S-1) in Studies 4 and 5

paramHeader	param	est	se	est_se	pval
GEN.BY	TRIM_2	0.890	0.015	59.215	< .001
GEN.BY	TRIM_5	0.823	0.022	38.112	< .001
GEN.BY	TRIM_7	0.796	0.022	36.023	< .001
GEN.BY	TRIM_10	0.794	0.022	35.407	< .001
GEN.BY	TRIM_11	0.874	0.015	57.384	< .001
GEN.BY	TRIM_12	0.853	0.018	48.329	< .001
GEN.BY	TRIM_15	0.840	0.020	42.337	< .001
GEN.BY	TRIM_18	0.884	0.015	59.978	< .001
GEN.BY	TRIM_3	0.708	0.030	23.656	< .001
GEN.BY	TRIM_6	0.876	0.015	58.331	< .001
GEN.BY	TRIM_8	0.885	0.015	59.362	< .001
GEN.BY	TRIM_14	0.619	0.034	17.974	< .001
GEN.BY	TRIM_16	0.783	0.023	33.681	< .001
GEN.BY	TRIM_1	0.310	0.071	4.347	< .001
GEN.BY	TRIM_4	0.541	0.045	12.124	< .001
GEN.BY	TRIM_9	0.314	0.055	5.715	< .001
GEN.BY	TRIM_13	0.371	0.064	5.833	< .001
GEN.BY	TRIM_17	0.497	0.053	9.440	< .001
REVENGE.BY	TRIM_1	0.849	0.031	27.550	< .001
REVENGE.BY	TRIM_4	0.747	0.031	23.973	< .001
REVENGE.BY	TRIM_9	0.727	0.033	22.044	< .001
REVENGE.BY	TRIM_13	0.849	0.030	27.933	< .001
REVENGE.BY	TRIM_17	0.792	0.031	25.176	< .001

Internal Consistency

McDonald's ω Hierarchical (General Factor): 0.8878108

McDonald's ω Hierarchical Subscale (Revenge Factor): 0.0193539

McDonald's ω Hierarchical Subscale (Revenge Factor): 0.7286548

Construct Reliability

"In contrast to omegaH and omegaHS values, which provide the correlation between a factor and a unit-weighted composite, H values provide the correlation between a factor and an optimally weighted item composite." (Rodriguez et al., p. 7)

General Factor: H = 0.968794

Benevolence Factor: H = 0.3146497

Revenge Factor: H = 0.8935431

"Hancock and Mueller (2001) have justified the need to meet a standard criterion of H = .70…" (ibid., p. 7)

By Hancock and Mueller's criterion, the general and revenge factors are represented well, but the benevolence factor is not specified reliably.

Explained Common Variance

"…simply because the data are more statistically consistent with a bifactor structure, for example, does not necessarily require that all the variables must be specified in a measurement model or that the more complex bifactor model even is necessary." (ibid., p. 7)

"We are not interested in the fitting of IRT models here, but rather in deciding whether to treat the multidimensional data with a bifactor structure as essentially unidimensional in an SEM measurement model." (ibid., p. 8)

ECV = 0.7370386, meaning that the general factor explains 0.7370386 of the common variance extracted with 0.2629614 spread across group factors.

Percent Uncontaminated Correlations

"To demonstrate the use of ECV and PUC, consider the MASC, with values of .80 and .77, respectively, on these indices. Under such conditions, we expect very little difference in the factor loadings between a unidimensional model and the general factor in a bifactor model." (ibid., p. 9)

PUC = 0.8366013

With our values of ECV and PUC being 0.737 and 0.837, respectively, we should also expect very little difference in the factor loadings between a unidimensional model and the general factor.

Average Parameter Bias

"We then computed the relative parameter bias as the difference between an item's loading in the unidimensional solution and its general factor loading in the bifactor (i.e., the truer model), divided by the general factor loading in the bifactor… According to Muthén, Kaplan, and Hollis (1987), parameter bias less than 10–15% is acceptable and poses no serious concern." (ibid., p. 9)

average bias = 0.2103422

Data derived from Studies 4 and 5 may be problematic, in terms of parameter bias, if we were to fit a unidimensional, rather than bifactor, model.

Table 49: Item Discrimination, Thresholds, and Location Indices for Studies 4 and 5

Item	subscale	a	b1	b2	b3	b4	LI_irf	tol_check	Mean
TRIM1	REV	0.310	-2.740	-2.024	-1.685	-0.651	-2.740	0	1.328221
TRIM17	REv	0.497	-2.249	-1.789	-1.224	-0.549	-2.249	0	1.450920
TRIM13	REV	0.371	-2.088	-1.569	-0.595	NA	-2.088	0	1.352761
TRIM4	REV	0.541	-2.024	-1.544	-1.147	-0.280	-2.024	0	1.598159
TRIM9	REV	0.314	-1.871	-1.347	-0.759	-0.077	-1.871	0	1.812883
TRIM3	BEN	0.708	-1.472	-0.877	-0.305	0.660	-1.472	0	3.613497
TRIM10	BEN	0.794	-1.449	-0.651	-0.162	0.470	-1.449	0	2.447853
TRIM15	AVO	0.840	-1.386	-0.935	-0.470	-0.062	-1.386	0	2.052147
TRIM18	AVO	0.884	-1.386	-0.719	-0.257	0.225	-1.386	0	2.306748
TRIM14	BEN	0.619	-1.386	-0.470	0.000	0.719	-1.386	0	3.334356
TRIM11	AVO	0.874	-1.367	-0.699	-0.209	0.280	-1.367	0	2.355828
TRIM5	AVO	0.823	-1.292	-0.622	-0.288	0.225	-1.292	0	2.340491
TRIM2	AVO	0.890	-1.257	-0.576	-0.108	0.411	-1.257	0	2.503067
TRIM8	BEN	0.885	-1.208	-0.811	-0.280	0.514	-1.208	0	3.592024
TRIM6	BEN	0.876	-1.177	-0.699	0.015	0.719	-1.177	0	3.368098
TRIM12	BEN	0.853	-1.147	-0.670	0.046	0.699	-1.147	0	3.346626
TRIM16	BEN	0.783	-1.103	-0.505	0.162	0.844	-1.103	0	3.193252
TRIM7	AVO	0.796	-1.009	-0.217	0.131	0.719	-1.009	0	2.886503