

## Higher-Order CFA Example Using Heartland Forgiveness Scale

Ninety items were initially written to measure self, other, and situation forgiveness (30 each). Exploratory factor analysis (actually, principal components analysis with varimax extraction – NOT MY DOING) revealed 6 distinct factors (and some useless factors left over) that mapped onto positively and negative worded items for each of the three factors. From there, 6 items were chosen for each of the 3 subscales, with 3 positively worded items and 3 negatively worded items for each subscale. We then tested a series of higher-order structural models.

### Model 1. Three correlated factors of Self, Other, and Situation (ignoring wording variance for now)

<pre>! Complete Model 1 -- 3 correlated factors  ! Measurement model item factor loadings (item 1 fixed=1)   Self BY Self1@1 Self2r* Self3* Self4r* Self5* Self6r*;   Other BY Other1r@1 Other2* Other3r* Other4* Other5r* Other6*;   Sit BY Sit1r@1 Sit2* Sit3r* Sit4* Sit5r* Sit6*;  ! Factor variances (all free)   Self* Other* Sit*;  ! Factor covariances (all free)   Self WITH Other* Sit*;   Other WITH Sit*;  ! Residual variances (all free)   Self1* Self2r* Self3* Self4r* Self5* Self6r*;   Other1r* Other2* Other3r* Other4* Other5r* Other6*;   Sit1r* Sit2* Sit3r* Sit4* Sit5r* Sit6*;  ! Item intercepts (all free)   [Self1* Self2r* Self3* Self4r* Self5* Self6r*];   [Other1r* Other2* Other3r* Other4* Other5r* Other6*];   [Sit1r* Sit2* Sit3r* Sit4* Sit5r* Sit6*];  ! Factor means (all fixed=0)   [Self@0 Other@0 Sit@0];  ! Bare Bones Model 1 -- 3 Forgiveness Factors   Self BY Self1@1 Self2r* Self3* Self4r* Self5* Self6r*;   Other BY Other1r@1 Other2* Other3r* Other4* Other5r* Other6*;   Sit BY Sit1r@1 Sit2* Sit3r* Sit4* Sit5r* Sit6*;   Self* Other* Sit*;</pre>	<p>TESTS OF MODEL FIT</p> <table> <tbody> <tr> <td colspan="3">Chi-Square Test of Model Fit</td> </tr> <tr> <td>Value</td> <td></td> <td>1642.116</td> </tr> <tr> <td>Degrees of Freedom</td> <td></td> <td>132</td> </tr> <tr> <td>P-Value</td> <td></td> <td>0.0000</td> </tr> <tr> <td colspan="3">CFI/TLI</td> </tr> <tr> <td>CFI</td> <td></td> <td>0.769</td> </tr> <tr> <td>TLI</td> <td></td> <td>0.732</td> </tr> <tr> <td colspan="3">Information Criteria</td> </tr> <tr> <td>Number of Free Parameters</td> <td></td> <td>39</td> </tr> <tr> <td>Akaike (AIC)</td> <td></td> <td>68544.408</td> </tr> <tr> <td>Bayesian (BIC)</td> <td></td> <td>68739.634</td> </tr> <tr> <td>Sample-Size Adjusted BIC</td> <td></td> <td>68615.760</td> </tr> <tr> <td></td> <td></td> <td>(n* = (n + 2) / 24)</td> </tr> <tr> <td colspan="3">RMSEA (Root Mean Square Error Of Approximation)</td> </tr> <tr> <td>Estimate</td> <td></td> <td>0.102</td> </tr> <tr> <td>90 Percent C.I.</td> <td>0.097</td> <td>0.106</td> </tr> <tr> <td>Probability RMSEA &lt;= .05</td> <td></td> <td>0.000</td> </tr> <tr> <td colspan="3">SRMR (Standardized Root Mean Square Residual)</td> </tr> <tr> <td>Value</td> <td></td> <td>0.089</td> </tr> </tbody> </table>	Chi-Square Test of Model Fit			Value		1642.116	Degrees of Freedom		132	P-Value		0.0000	CFI/TLI			CFI		0.769	TLI		0.732	Information Criteria			Number of Free Parameters		39	Akaike (AIC)		68544.408	Bayesian (BIC)		68739.634	Sample-Size Adjusted BIC		68615.760			(n* = (n + 2) / 24)	RMSEA (Root Mean Square Error Of Approximation)			Estimate		0.102	90 Percent C.I.	0.097	0.106	Probability RMSEA <= .05		0.000	SRMR (Standardized Root Mean Square Residual)			Value		0.089
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	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value		Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
SELF BY					SELF BY				
SELF1	1.000	0.000	999.000	999.000	SELF1	0.442	0.028	15.711	0.000
SELF2R	1.646	0.139	11.839	0.000	SELF2R	0.619	0.022	27.564	0.000
SELF3	0.761	0.079	9.679	0.000	SELF3	0.378	0.030	12.705	0.000
SELF4R	1.935	0.149	13.005	0.000	SELF4R	0.794	0.017	47.355	0.000
SELF5	1.067	0.095	11.225	0.000	SELF5	0.479	0.027	17.704	0.000
SELF6R	1.823	0.143	12.743	0.000	SELF6R	0.723	0.019	38.792	0.000
OTHER BY					OTHER BY				
OTHER1R	1.000	0.000	999.000	999.000	OTHER1R	0.664	0.022	29.539	0.000
OTHER2	0.799	0.059	13.421	0.000	OTHER2	0.516	0.027	18.961	0.000
OTHER3R	1.191	0.062	19.279	0.000	OTHER3R	0.698	0.022	31.710	0.000
OTHER4	0.947	0.063	15.019	0.000	OTHER4	0.611	0.024	25.053	0.000
OTHER5R	1.041	0.062	16.666	0.000	OTHER5R	0.632	0.023	27.637	0.000
OTHER6	0.686	0.051	13.500	0.000	OTHER6	0.525	0.027	19.268	0.000
SIT BY					SIT BY				
SIT1R	1.000	0.000	999.000	999.000	SIT1R	0.688	0.021	33.274	0.000
SIT2	0.606	0.043	13.974	0.000	SIT2	0.527	0.026	20.080	0.000
SIT3R	1.008	0.045	22.393	0.000	SIT3R	0.759	0.018	42.152	0.000
SIT4	0.690	0.045	15.468	0.000	SIT4	0.591	0.024	24.366	0.000
SIT5R	0.847	0.049	17.299	0.000	SIT5R	0.592	0.023	25.965	0.000
SIT6	0.700	0.047	14.922	0.000	SIT6	0.550	0.025	22.095	0.000
SELF WITH					SELF WITH				
OTHER	0.225	0.032	7.076	0.000	OTHER	0.344	0.035	9.870	0.000
SIT	0.576	0.056	10.293	0.000	SIT	0.732	0.023	32.099	0.000
OTHER WITH					OTHER WITH				
SIT	0.662	0.058	11.312	0.000	SIT	0.554	0.030	18.758	0.000
Variances					Variances				
SELF	0.430	0.062	6.910	0.000	SELF	1.000	0.000	999.000	999.000
OTHER	0.989	0.091	10.896	0.000	OTHER	1.000	0.000	999.000	999.000
SIT	1.442	0.124	11.674	0.000	SIT	1.000	0.000	999.000	999.000
Residual Variances					Residual Variances				
SELF1	1.773	0.080	22.043	0.000	SELF1	0.805	0.025	32.398	0.000
SELF2R	1.880	0.093	20.208	0.000	SELF2R	0.617	0.028	22.231	0.000
SELF3	1.493	0.067	22.450	0.000	SELF3	0.857	0.023	38.089	0.000
SELF4R	0.945	0.065	14.588	0.000	SELF4R	0.370	0.027	13.907	0.000
SELF5	1.647	0.076	21.770	0.000	SELF5	0.771	0.026	29.778	0.000
SELF6R	1.308	0.073	17.983	0.000	SELF6R	0.478	0.027	17.755	0.000
OTHER1R	1.251	0.069	18.027	0.000	OTHER1R	0.558	0.030	18.683	0.000
OTHER2	1.738	0.084	20.796	0.000	OTHER2	0.734	0.028	26.129	0.000
OTHER3R	1.477	0.089	16.588	0.000	OTHER3R	0.513	0.031	16.696	0.000
OTHER4	1.486	0.078	19.150	0.000	OTHER4	0.626	0.030	20.993	0.000
OTHER5R	1.606	0.083	19.280	0.000	OTHER5R	0.600	0.029	20.729	0.000
OTHER6	1.221	0.060	20.507	0.000	OTHER6	0.724	0.029	25.272	0.000
SIT1R	1.607	0.088	18.236	0.000	SIT1R	0.527	0.028	18.541	0.000
SIT2	1.373	0.066	20.953	0.000	SIT2	0.722	0.028	26.052	0.000
SIT3R	1.078	0.067	16.057	0.000	SIT3R	0.424	0.027	15.515	0.000
SIT4	1.281	0.064	20.071	0.000	SIT4	0.651	0.029	22.736	0.000
SIT5R	1.912	0.091	20.969	0.000	SIT5R	0.649	0.027	24.018	0.000
SIT6	1.634	0.078	21.061	0.000	SIT6	0.698	0.027	25.504	0.000



**Model 3. Three correlated factors of Self, Other, and Situation, 2 uncorrelated wording factors**

<pre> ! Model3 -- 3 Forgiveness Factors, 2 Wording Factors Self BY Self1* Self2r* Self3* Self4r* Self5* Self6r*; Other BY Other1r* Other2* Other3r* Other4* Other5r* Other6*; Sit BY Sit1r* Sit2* Sit3r* Sit4* Sit5r* Sit6*;  Positive BY Self1* Self3* Self5* Other2* Other4* Other6*           Sit2* Sit4* Sit6*; Negative BY Self2r* Self4r* Self6r* Other1r* Other3r* Other5r*           Sit1r* Sit3r* Sit5r*;  Self Other Sit WITH Positive@0 Negative@0; Positive WITH Negative@0; Self@1; Other@1; Sit@1; Positive@1; Negative@1;  TESTS OF MODEL FIT  Chi-Square Test of Model Fit Value          352.181 Degrees of Freedom    114 P-Value          0.0000  CFI/TLI CFI          0.964 TLI          0.951  Information Criteria Number of Free Parameters    57 Akaike (AIC)          67290.473 Bayesian (BIC)        67575.803 Sample-Size Adjusted BIC    67394.757 (n* = (n + 2) / 24)  RMSEA (Root Mean Square Error Of Approximation) Estimate          0.044 90 Percent C.I.    0.038  0.049 Probability RMSEA &lt;= .05    0.980  SRMR (Standardized Root Mean Square Residual) Value          0.039                 </pre> <p><b>How does this model compare with the previous one?</b></p> <p>Modification indices and inspection of residuals suggested several residual relationships between items of the same content and wording direction (e.g., self4r and self6r). We then postulated a different structure of lower-order factors that could better account for such relationships.</p>	<p>STANDARDIZED STDYX MODEL RESULTS</p> <table border="1"> <thead> <tr> <th></th> <th>Estimate</th> <th>S.E.</th> <th>Est./S.E.</th> <th>Two-Tailed P-Value</th> </tr> </thead> <tbody> <tr><td colspan="5"><b>SELF BY</b></td></tr> <tr><td>SELF1</td><td>0.488</td><td>0.035</td><td>14.155</td><td>0.000</td></tr> <tr><td>SELF2R</td><td>0.358</td><td>0.044</td><td>8.205</td><td>0.000</td></tr> <tr><td>SELF3</td><td>0.422</td><td>0.036</td><td>11.691</td><td>0.000</td></tr> <tr><td>SELF4R</td><td>0.619</td><td>0.038</td><td>16.219</td><td>0.000</td></tr> <tr><td>SELF5</td><td>0.514</td><td>0.034</td><td>15.262</td><td>0.000</td></tr> <tr><td>SELF6R</td><td>0.524</td><td>0.041</td><td>12.794</td><td>0.000</td></tr> <tr><td colspan="5"><b>OTHER BY</b></td></tr> <tr><td>OTHER1R</td><td>0.685</td><td>0.022</td><td>30.903</td><td>0.000</td></tr> <tr><td>OTHER2</td><td>0.400</td><td>0.028</td><td>14.092</td><td>0.000</td></tr> <tr><td>OTHER3R</td><td>0.781</td><td>0.019</td><td>40.180</td><td>0.000</td></tr> <tr><td>OTHER4</td><td>0.522</td><td>0.026</td><td>20.250</td><td>0.000</td></tr> <tr><td>OTHER5R</td><td>0.659</td><td>0.023</td><td>28.885</td><td>0.000</td></tr> <tr><td>OTHER6</td><td>0.389</td><td>0.028</td><td>13.670</td><td>0.000</td></tr> <tr><td colspan="5"><b>SIT BY</b></td></tr> <tr><td>SIT1R</td><td>0.694</td><td>0.026</td><td>27.075</td><td>0.000</td></tr> <tr><td>SIT2</td><td>0.403</td><td>0.029</td><td>13.791</td><td>0.000</td></tr> <tr><td>SIT3R</td><td>0.775</td><td>0.024</td><td>32.572</td><td>0.000</td></tr> <tr><td>SIT4</td><td>0.467</td><td>0.028</td><td>16.652</td><td>0.000</td></tr> <tr><td>SIT5R</td><td>0.567</td><td>0.028</td><td>19.940</td><td>0.000</td></tr> <tr><td>SIT6</td><td>0.442</td><td>0.028</td><td>15.575</td><td>0.000</td></tr> <tr><td colspan="5"><b>POSITIVE BY</b></td></tr> <tr><td>SELF1</td><td>0.345</td><td>0.033</td><td>10.295</td><td>0.000</td></tr> <tr><td>SELF3</td><td>0.338</td><td>0.034</td><td>9.908</td><td>0.000</td></tr> <tr><td>SELF5</td><td>0.333</td><td>0.033</td><td>10.081</td><td>0.000</td></tr> <tr><td>OTHER2</td><td>0.453</td><td>0.029</td><td>15.544</td><td>0.000</td></tr> <tr><td>OTHER4</td><td>0.387</td><td>0.029</td><td>13.335</td><td>0.000</td></tr> <tr><td>OTHER6</td><td>0.550</td><td>0.027</td><td>20.088</td><td>0.000</td></tr> <tr><td>SIT2</td><td>0.602</td><td>0.026</td><td>22.730</td><td>0.000</td></tr> <tr><td>SIT4</td><td>0.554</td><td>0.027</td><td>20.645</td><td>0.000</td></tr> <tr><td>SIT6</td><td>0.460</td><td>0.029</td><td>16.101</td><td>0.000</td></tr> <tr><td colspan="5"><b>NEGATIVE BY</b></td></tr> <tr><td>SELF2R</td><td>0.632</td><td>0.045</td><td>13.994</td><td>0.000</td></tr> <tr><td>SELF4R</td><td>0.525</td><td>0.045</td><td>11.756</td><td>0.000</td></tr> <tr><td>SELF6R</td><td>0.505</td><td>0.046</td><td>11.026</td><td>0.000</td></tr> <tr><td>OTHER1R</td><td>0.117</td><td>0.043</td><td>2.722</td><td>0.006</td></tr> <tr><td>OTHER3R</td><td>0.054</td><td>0.043</td><td>1.255</td><td>0.209</td></tr> <tr><td>OTHER5R</td><td>0.027</td><td>0.041</td><td>0.654</td><td>0.513</td></tr> <tr><td>SIT1R</td><td>0.299</td><td>0.044</td><td>6.788</td><td>0.000</td></tr> <tr><td>SIT3R</td><td>0.247</td><td>0.045</td><td>5.454</td><td>0.000</td></tr> <tr><td>SIT5R</td><td>0.214</td><td>0.044</td><td>4.916</td><td>0.000</td></tr> <tr><td colspan="5"><b>OTHER WITH</b></td></tr> <tr><td>SELF</td><td>0.279</td><td>0.045</td><td>6.153</td><td>0.000</td></tr> <tr><td colspan="5"><b>SIT WITH</b></td></tr> <tr><td>SELF</td><td>0.663</td><td>0.032</td><td>20.788</td><td>0.000</td></tr> <tr><td>OTHER</td><td>0.476</td><td>0.033</td><td>14.222</td><td>0.000</td></tr> </tbody> </table> <p>(all other factor correlations held to 0)</p>		Estimate	S.E.	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Two-Tailed P-Value	<b>SELF BY</b>					SELF1	0.488	0.035	14.155	0.000	SELF2R	0.358	0.044	8.205	0.000	SELF3	0.422	0.036	11.691	0.000	SELF4R	0.619	0.038	16.219	0.000	SELF5	0.514	0.034	15.262	0.000	SELF6R	0.524	0.041	12.794	0.000	<b>OTHER BY</b>					OTHER1R	0.685	0.022	30.903	0.000	OTHER2	0.400	0.028	14.092	0.000	OTHER3R	0.781	0.019	40.180	0.000	OTHER4	0.522	0.026	20.250	0.000	OTHER5R	0.659	0.023	28.885	0.000	OTHER6	0.389	0.028	13.670	0.000	<b>SIT BY</b>					SIT1R	0.694	0.026	27.075	0.000	SIT2	0.403	0.029	13.791	0.000	SIT3R	0.775	0.024	32.572	0.000	SIT4	0.467	0.028	16.652	0.000	SIT5R	0.567	0.028	19.940	0.000	SIT6	0.442	0.028	15.575	0.000	<b>POSITIVE BY</b>					SELF1	0.345	0.033	10.295	0.000	SELF3	0.338	0.034	9.908	0.000	SELF5	0.333	0.033	10.081	0.000	OTHER2	0.453	0.029	15.544	0.000	OTHER4	0.387	0.029	13.335	0.000	OTHER6	0.550	0.027	20.088	0.000	SIT2	0.602	0.026	22.730	0.000	SIT4	0.554	0.027	20.645	0.000	SIT6	0.460	0.029	16.101	0.000	<b>NEGATIVE BY</b>					SELF2R	0.632	0.045	13.994	0.000	SELF4R	0.525	0.045	11.756	0.000	SELF6R	0.505	0.046	11.026	0.000	OTHER1R	0.117	0.043	2.722	0.006	OTHER3R	0.054	0.043	1.255	0.209	OTHER5R	0.027	0.041	0.654	0.513	SIT1R	0.299	0.044	6.788	0.000	SIT3R	0.247	0.045	5.454	0.000	SIT5R	0.214	0.044	4.916	0.000	<b>OTHER WITH</b>					SELF	0.279	0.045	6.153	0.000	<b>SIT WITH</b>					SELF	0.663	0.032	20.788	0.000	OTHER	0.476	0.033	14.222	0.000
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SELF5	0.333	0.033	10.081	0.000																																																																																																																																																																																																																																								
OTHER2	0.453	0.029	15.544	0.000																																																																																																																																																																																																																																								
OTHER4	0.387	0.029	13.335	0.000																																																																																																																																																																																																																																								
OTHER6	0.550	0.027	20.088	0.000																																																																																																																																																																																																																																								
SIT2	0.602	0.026	22.730	0.000																																																																																																																																																																																																																																								
SIT4	0.554	0.027	20.645	0.000																																																																																																																																																																																																																																								
SIT6	0.460	0.029	16.101	0.000																																																																																																																																																																																																																																								
<b>NEGATIVE BY</b>																																																																																																																																																																																																																																												
SELF2R	0.632	0.045	13.994	0.000																																																																																																																																																																																																																																								
SELF4R	0.525	0.045	11.756	0.000																																																																																																																																																																																																																																								
SELF6R	0.505	0.046	11.026	0.000																																																																																																																																																																																																																																								
OTHER1R	0.117	0.043	2.722	0.006																																																																																																																																																																																																																																								
OTHER3R	0.054	0.043	1.255	0.209																																																																																																																																																																																																																																								
OTHER5R	0.027	0.041	0.654	0.513																																																																																																																																																																																																																																								
SIT1R	0.299	0.044	6.788	0.000																																																																																																																																																																																																																																								
SIT3R	0.247	0.045	5.454	0.000																																																																																																																																																																																																																																								
SIT5R	0.214	0.044	4.916	0.000																																																																																																																																																																																																																																								
<b>OTHER WITH</b>																																																																																																																																																																																																																																												
SELF	0.279	0.045	6.153	0.000																																																																																																																																																																																																																																								
<b>SIT WITH</b>																																																																																																																																																																																																																																												
SELF	0.663	0.032	20.788	0.000																																																																																																																																																																																																																																								
OTHER	0.476	0.033	14.222	0.000																																																																																																																																																																																																																																								

**Model 4. Six lower-order factors for positive and negative self, other, and situation forgiveness, allowed to be freely correlated.**

<pre> ! Model4 -- Correlated 6 factors of forgiveness + wording SelfPos BY Self1@1 Self3* Self5*; SelfNeg BY Self2r@1 Self4r* Self6r*; OthPos BY Other2@1 Other4* Other6*; OthNeg BY Other1r@1 Other3r* Other5r*; SitPos BY Sit2@1 Sit4* Sit6*; SitNeg BY Sit1r@1 Sit3r* Sit5r*;  TESTS OF MODEL FIT  Chi-Square Test of Model Fit Value          363.047 Degrees of Freedom    120 P-Value          0.0000  CFI/TLI CFI          0.963 TLI          0.953  Information Criteria Number of Free Parameters    51 Akaike (AIC)          67289.338 Bayesian (BIC)        67544.634 Sample-Size Adjusted BIC    67382.645 (n* = (n + 2) / 24)  RMSEA (Root Mean Square Error Of Approximation) Estimate          0.043 90 Percent C.I.    0.038  0.048 Probability RMSEA &lt;= .05    0.990  SRMR (Standardized Root Mean Square Residual) Value          0.037                 </pre>							<p>STANDARDIZED STDYX MODEL RESULTS</p> <table border="1"> <thead> <tr> <th></th> <th>Estimate</th> <th>S.E.</th> <th>Est./S.E.</th> <th>Two-Tailed P-Value</th> </tr> </thead> <tbody> <tr><td>SELFPOS BY</td><td></td><td></td><td></td><td></td></tr> <tr><td>SELF1</td><td>0.621</td><td>0.025</td><td>24.875</td><td>0.000</td></tr> <tr><td>SELF3</td><td>0.570</td><td>0.026</td><td>21.560</td><td>0.000</td></tr> <tr><td>SELF5</td><td>0.633</td><td>0.025</td><td>25.500</td><td>0.000</td></tr> <tr><td>SELFNEG BY</td><td></td><td></td><td></td><td></td></tr> <tr><td>SELF2R</td><td>0.661</td><td>0.021</td><td>31.561</td><td>0.000</td></tr> <tr><td>SELF4R</td><td>0.828</td><td>0.016</td><td>50.555</td><td>0.000</td></tr> <tr><td>SELF6R</td><td>0.735</td><td>0.019</td><td>39.253</td><td>0.000</td></tr> <tr><td>OTHPOS BY</td><td></td><td></td><td></td><td></td></tr> <tr><td>OTHER2</td><td>0.626</td><td>0.023</td><td>26.645</td><td>0.000</td></tr> <tr><td>OTHER4</td><td>0.666</td><td>0.023</td><td>29.429</td><td>0.000</td></tr> <tr><td>OTHER6</td><td>0.676</td><td>0.022</td><td>30.493</td><td>0.000</td></tr> <tr><td>OTHNEG BY</td><td></td><td></td><td></td><td></td></tr> <tr><td>OTHER1R</td><td>0.711</td><td>0.020</td><td>34.893</td><td>0.000</td></tr> <tr><td>OTHER3R</td><td>0.797</td><td>0.019</td><td>42.919</td><td>0.000</td></tr> <tr><td>OTHER5R</td><td>0.642</td><td>0.023</td><td>28.491</td><td>0.000</td></tr> <tr><td>SITPOS BY</td><td></td><td></td><td></td><td></td></tr> <tr><td>SIT2</td><td>0.725</td><td>0.019</td><td>38.084</td><td>0.000</td></tr> <tr><td>SIT4</td><td>0.748</td><td>0.018</td><td>40.996</td><td>0.000</td></tr> <tr><td>SIT6</td><td>0.642</td><td>0.022</td><td>29.671</td><td>0.000</td></tr> <tr><td>SITNEG BY</td><td></td><td></td><td></td><td></td></tr> <tr><td>SIT1R</td><td>0.770</td><td>0.017</td><td>45.766</td><td>0.000</td></tr> <tr><td>SIT3R</td><td>0.823</td><td>0.015</td><td>53.231</td><td>0.000</td></tr> <tr><td>SIT5R</td><td>0.607</td><td>0.023</td><td>26.956</td><td>0.000</td></tr> <tr><td>SELFNEG WITH</td><td></td><td></td><td></td><td></td></tr> <tr><td>SELFPOS</td><td>0.560</td><td>0.034</td><td>16.559</td><td>0.000</td></tr> <tr><td>OTHPOS WITH</td><td></td><td></td><td></td><td></td></tr> <tr><td>SELFPOS</td><td>0.546</td><td>0.038</td><td>14.430</td><td>0.000</td></tr> <tr><td>SELFNEG</td><td>0.233</td><td>0.039</td><td>5.967</td><td>0.000</td></tr> <tr><td>OTHNEG WITH</td><td></td><td></td><td></td><td></td></tr> <tr><td>SELFPOS</td><td>0.208</td><td>0.042</td><td>4.968</td><td>0.000</td></tr> <tr><td>SELFNEG</td><td>0.280</td><td>0.036</td><td>7.713</td><td>0.000</td></tr> <tr><td>OTHPOS</td><td>0.630</td><td>0.031</td><td>20.126</td><td>0.000</td></tr> <tr><td>SITPOS WITH</td><td></td><td></td><td></td><td></td></tr> <tr><td>SELFPOS</td><td>0.780</td><td>0.028</td><td>27.504</td><td>0.000</td></tr> <tr><td>SELFNEG</td><td>0.427</td><td>0.034</td><td>12.685</td><td>0.000</td></tr> <tr><td>OTHPOS</td><td>0.707</td><td>0.029</td><td>24.582</td><td>0.000</td></tr> <tr><td>OTHNEG</td><td>0.293</td><td>0.037</td><td>7.876</td><td>0.000</td></tr> <tr><td>SITNEG WITH</td><td></td><td></td><td></td><td></td></tr> <tr><td>SELFPOS</td><td>0.459</td><td>0.036</td><td>12.644</td><td>0.000</td></tr> <tr><td>SELFNEG</td><td>0.667</td><td>0.025</td><td>26.478</td><td>0.000</td></tr> <tr><td>OTHPOS</td><td>0.324</td><td>0.038</td><td>8.642</td><td>0.000</td></tr> <tr><td>OTHNEG</td><td>0.470</td><td>0.032</td><td>14.569</td><td>0.000</td></tr> <tr><td>SITPOS</td><td>0.570</td><td>0.030</td><td>19.080</td><td>0.000</td></tr> </tbody> </table>						Estimate	S.E.	Est./S.E.	Two-Tailed P-Value	SELFPOS BY					SELF1	0.621	0.025	24.875	0.000	SELF3	0.570	0.026	21.560	0.000	SELF5	0.633	0.025	25.500	0.000	SELFNEG BY					SELF2R	0.661	0.021	31.561	0.000	SELF4R	0.828	0.016	50.555	0.000	SELF6R	0.735	0.019	39.253	0.000	OTHPOS BY					OTHER2	0.626	0.023	26.645	0.000	OTHER4	0.666	0.023	29.429	0.000	OTHER6	0.676	0.022	30.493	0.000	OTHNEG BY					OTHER1R	0.711	0.020	34.893	0.000	OTHER3R	0.797	0.019	42.919	0.000	OTHER5R	0.642	0.023	28.491	0.000	SITPOS BY					SIT2	0.725	0.019	38.084	0.000	SIT4	0.748	0.018	40.996	0.000	SIT6	0.642	0.022	29.671	0.000	SITNEG BY					SIT1R	0.770	0.017	45.766	0.000	SIT3R	0.823	0.015	53.231	0.000	SIT5R	0.607	0.023	26.956	0.000	SELFNEG WITH					SELFPOS	0.560	0.034	16.559	0.000	OTHPOS WITH					SELFPOS	0.546	0.038	14.430	0.000	SELFNEG	0.233	0.039	5.967	0.000	OTHNEG WITH					SELFPOS	0.208	0.042	4.968	0.000	SELFNEG	0.280	0.036	7.713	0.000	OTHPOS	0.630	0.031	20.126	0.000	SITPOS WITH					SELFPOS	0.780	0.028	27.504	0.000	SELFNEG	0.427	0.034	12.685	0.000	OTHPOS	0.707	0.029	24.582	0.000	OTHNEG	0.293	0.037	7.876	0.000	SITNEG WITH					SELFPOS	0.459	0.036	12.644	0.000	SELFNEG	0.667	0.025	26.478	0.000	OTHPOS	0.324	0.038	8.642	0.000	OTHNEG	0.470	0.032	14.569	0.000	SITPOS	0.570	0.030	19.080	0.000
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<p><b>How does this model compare with the previous one?</b></p> <table border="1"> <thead> <tr> <th></th> <th>SelfNeg</th> <th>OthNeg</th> <th>SitNeg</th> <th>SelfPos</th> <th>OthPos</th> <th>SitPos</th> </tr> </thead> <tbody> <tr> <td>SelfNeg</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>OthNeg</td> <td>0.280</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SitNeg</td> <td>0.667</td> <td>0.470</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SelfPos</td> <td>0.560</td> <td>0.208</td> <td>0.459</td> <td></td> <td></td> <td></td> </tr> <tr> <td>OthPos</td> <td>0.233</td> <td>0.630</td> <td>0.324</td> <td>0.546</td> <td></td> <td></td> </tr> <tr> <td>SitPos</td> <td>0.427</td> <td>0.293</td> <td>0.570</td> <td>0.780</td> <td>0.707</td> <td></td> </tr> </tbody> </table>								SelfNeg	OthNeg	SitNeg	SelfPos	OthPos	SitPos	SelfNeg							OthNeg	0.280						SitNeg	0.667	0.470					SelfPos	0.560	0.208	0.459				OthPos	0.233	0.630	0.324	0.546			SitPos	0.427	0.293	0.570	0.780	0.707																																																																																																																																																																																						
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**Model 5. Six lower-order factors for positive and negative self, other, and situation forgiveness, 3 higher-order correlated factors of Self, Other, and Situation, 2 uncorrelated wording factors**

The end result of a series of increasingly restrictive models was the following equality constraints: loadings and residual variances for positively-worded lower-order factors (and for negative factors) were constrained to equality; loadings for both method factors were constrained to equality.

! Model5 -- Final Model - Figure 1		STANDARDIZED STDYX MODEL RESULTS				
SelfPos BY Self1@1 Self3* Self5*;						
SelfNeg BY Self2r@1 Self4r* Self6r*;						
OthPos BY Other2@1 Other4* Other6*;						
OthNeg BY Other1r@1 Other3r* Other5r*;						
SitPos BY Sit2@1 Sit4* Sit6*;						
SitNeg BY Sit1r@1 Sit3r* Sit5r*;						
Self BY SelfPos* (1)						
SelfNeg* (2);						
Other BY OthPos* (1)						
OthNeg* (2);						
Sit BY SitPos* (1)						
SitNeg* (2);						
Self@1; Other@1; Sit@1;						
SelfPos* OthPos* SitPos* (3);						
SelfNeg* OthNeg* SitNeg* (4);						
Pos BY SelfPos* OthPos* SitPos* (5);						
Neg BY SelfNeg* OthNeg* SitNeg* (5);						
Pos@1; Neg@1;						
Pos Neg WITH Self@0 Other@0 Sit@0;						
Pos WITH Neg@0;						
TESTS OF MODEL FIT						
Chi-Square Test of Model Fit						
Value	421.943					
Degrees of Freedom	133					
P-Value	0.0000					
CFI/TLI						
CFI	0.956					
TLI	0.949					
Information Criteria						
Number of Free Parameters	56					
Akaike (AIC)	67358.235					
Bayesian (BIC)	67638.559					
Sample-Size Adjusted BIC	67460.689					
(n* = (n + 2) / 24)						
RMSEA (Root Mean Square Error Of Approximation)						
Estimate	0.044					
90 Percent C.I.	0.040 0.049					
Probability RMSEA <= .05	0.973					
SRMR (Standardized Root Mean Square Residual)						
Value	0.046					
		Estimate	S.E.	Est./S.E.	Two-Tailed P-Value	
SELFPOS BY						
SELF1	0.628	0.016	39.865	0.000		
SELF3	0.556	0.026	21.281	0.000		
SELF5	0.624	0.024	25.668	0.000		
SELFNEG BY						
SELF2R	0.676	0.013	50.472	0.000		
SELF4R	0.829	0.016	52.106	0.000		
SELF6R	0.739	0.018	40.496	0.000		
OTHPOS BY						
OTHER2	0.618	0.016	38.808	0.000		
OTHER4	0.669	0.023	29.489	0.000		
OTHER6	0.673	0.023	29.722	0.000		
OTHNEG BY						
OTHER1R	0.763	0.013	57.752	0.000		
OTHER3R	0.796	0.018	44.577	0.000		
OTHER5R	0.642	0.023	28.478	0.000		
SITPOS BY						
SIT2	0.698	0.015	45.183	0.000		
SIT4	0.744	0.018	40.627	0.000		
SIT6	0.633	0.022	29.253	0.000		
SITNEG BY						
SIT1R	0.720	0.014	51.603	0.000		
SIT3R	0.832	0.016	52.325	0.000		
SIT5R	0.599	0.023	26.430	0.000		
SELF BY						
SELFPOS	0.774	0.025	31.422	0.000		
SELFNEG	0.754	0.020	37.062	0.000		
OTHER BY						
OTHPOS	0.774	0.025	31.422	0.000		
OTHNEG	0.754	0.020	37.062	0.000		
SIT BY						
SITPOS	0.774	0.025	31.422	0.000		
SITNEG	0.754	0.020	37.062	0.000		
POS BY						
SELFPOS	0.568	0.024	24.124	0.000		
OTHPOS	0.568	0.024	24.124	0.000		
SITPOS	0.568	0.024	24.124	0.000		
NEG BY						
SELFNEG	0.444	0.018	24.872	0.000		
OTHNEG	0.444	0.018	24.872	0.000		
SITNEG	0.444	0.018	24.872	0.000		
OTHER WITH						
SELF	0.306	0.050	6.096	0.000		
SIT WITH						
SELF	0.782	0.030	26.041	0.000		
OTHER	0.537	0.039	13.611	0.000		

**Finally, one last (non-nested) model was estimated to answer a cranky reviewer... but victory was ours.**

Model 6. Same 6 lower-order factors for positive and negative self, other, and situation forgiveness. The positive lower-order factors loaded onto a higher-order factor of “forgiveness”, and the negative lower-order factors loaded onto a higher-order factor of “unforgiveness”. Lower-order factors of the same type were constrained to have the same loadings across the forgiveness and unforgiveness factors, and the latter two were allowed to correlate. Uncorrelated “method” factors of self, other, and situation were then estimated, and all loadings were constrained equal.

! Model6 -- Forgiveness vs. Unforgiveness - types as methods		STANDARDIZED STDYX MODEL RESULTS			
<pre> SelfPos BY Self1@1 Self3* Self5*; SelfNeg BY Self2r@1 Self4r* Self6r*; OthPos BY Other2@1 Other4* Other6*; OthNeg BY Other1r@1 Other3r* Other5r*; SitPos BY Sit2@1 Sit4* Sit6*; SitNeg BY Sit1r@1 Sit3r* Sit5r*; Self BY SelfPos* SelfNeg*(1); Other BY OthPos* OthNeg* (1); Sit BY SitPos* SitNeg* (1); Self@1; Other@1; Sit@1; SelfPos* SelfNeg* (2); OthPos* OthNeg* (3); SitPos* SitNeg* (4); Pos BY SelfPos* (5)       OthPos* (6)       SitPos* (7); Neg BY SelfNeg* (5)       OthNeg* (6)       SitNeg* (7); Pos@1; Neg@1; Pos Neg WITH Self@0 Other@0 Sit@0; Self WITH Other@0 Sit@0; Other WITH Sit@0;           </pre>	<pre> STANDARDIZED STDYX MODEL RESULTS  SELFPOS BY   SELF1      0.684    0.017    39.265    0.000   SELF3      0.575    0.027    21.552    0.000   SELF5      0.639    0.025    25.511    0.000 SELFNEG BY   SELF2R     0.622    0.017    36.755    0.000   SELF4R     0.815    0.017    48.791    0.000   SELF6R     0.732    0.019    39.106    0.000 OTHPOS BY   OTHER2     0.622    0.018    33.651    0.000   OTHER4     0.670    0.024    28.215    0.000   OTHER6     0.676    0.024    28.319    0.000 OTHNEG BY   OTHER1R    0.658    0.019    35.093    0.000   OTHER3R    0.780    0.020    39.576    0.000   OTHER5R    0.635    0.023    27.885    0.000 SITPOS BY   SIT2       0.795    0.013    61.664    0.000   SIT4       0.756    0.018    42.426    0.000   SIT6       0.648    0.022    29.904    0.000 SITNEG BY   SIT1R      0.710    0.015    47.212    0.000   SIT3R      0.818    0.016    51.209    0.000   SIT5R      0.616    0.022    27.605    0.000 SELF BY   SELFPOS    0.491    0.022    22.701    0.000   SELFNEG    0.491    0.022    22.701    0.000 OTHER BY   OTHPOS     0.549    0.025    21.836    0.000   OTHNEG     0.549    0.025    21.836    0.000 SIT BY   SITPOS     0.436    0.019    23.448    0.000   SITNEG     0.436    0.019    23.448    0.000 POS BY   SELFPOS    0.727    0.021    34.312    0.000   OTHPOS     0.638    0.024    26.906    0.000   SITPOS     0.892    0.018    48.383    0.000 NEG BY   SELFNEG    0.727    0.021    34.312    0.000   OTHNEG     0.638    0.024    26.906    0.000   SITNEG     0.892    0.018    48.383    0.000 NEG WITH   POS        0.540    0.033    16.426    0.000           </pre>				
<pre> Chi-Square Test of Model Fit   Value          548.222   Degrees of Freedom      133   P-Value          0.0000 CFI/TLI   CFI              0.936   TLI              0.927 Information Criteria   Number of Free Parameters      38   Akaike (AIC)                   67448.514   Bayesian (BIC)                  67638.734   Sample-Size Adjusted BIC        67518.036   (n* = (n + 2) / 24) RMSEA (Root Mean Square Error Of Approximation)   Estimate              0.053   90 Percent C.I.      0.049    0.058   Probability RMSEA &lt;= .05      0.124 SRMR (Standardized Root Mean Square Residual)   Value              0.058           </pre>					