

**Supplementary Material for “Factor Structure and Measurement Invariance of the  
MHC-SF in United States”**

**Table 5**  
*Confirmatory and Exploratory Factor Analyses with MLR*

Model	$\chi^2$	df	CFI	TLI	SRMR	AIC	BIC	RMSEA	90% CI for RMSEA	
									LL	UL
1-factor	19460.150	77	0.838	0.808	0.064	936321.922	936660.952	0.103	0.102	0.104
2-factor ESEM	3901.691	52	0.968	0.944	0.021	914163.704	914704.537	0.056	0.054	0.057
2-factor CFA	10606.570	74	0.912	0.892	0.053	923403.571	923766.817	0.078	0.076	0.079

*Note.* LL = lower limit; UL = upper limit. All  $\chi^2$  estimates are significant at  $p < .001$ .

Table 6  
*Standardized Factor Loading for the Three-Factor ESEM  
 Model Using Target Rotation*

	Emotional	Social	Psychological
Emotional			
Item 1	<b>0.963</b> ***	-0.007	-0.124***
Item 2	<b>0.641</b> ***	0.013*	0.188***
Item 3	<b>0.714</b> ***	0.104***	0.032***
Social			
Item 4	0.119***	0.232***	<b>0.436</b> ***
Item 5	0.210***	<b>0.327</b> ***	0.240***
Item 6	-0.065***	<b>0.931</b> ***	-0.079***
Item 7	0.026**	<b>0.718</b> ***	-0.042***
Item 8	-0.083***	<b>0.823</b> ***	-0.072***
Psychological			
Item 9	0.205***	0.063***	<b>0.537</b> ***
Item 10	0.083***	0.069***	<b>0.555</b> ***
Item 11	0.210***	0.105***	<b>0.471</b> ***
Item 12	-0.120***	0.048***	<b>0.771</b> ***
Item 13	-0.054***	-0.029***	<b>0.783</b> ***
Item 14	0.006	0.063***	<b>0.748</b> ***

*Note.* Loadings that are larger than .30 are shown in boldface.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .01$

Table 7  
*Standardized Factor Loading for the Three-Factor ESEM  
 Model Using CF-Facparsim Rotation*

	Emotional	Social	Psychological
Emotional			
Item 1	<b>0.849</b> <sup>***</sup>	0.075 <sup>***</sup>	-0.027 <sup>***</sup>
Item 2	<b>0.629</b> <sup>***</sup>	0.096 <sup>***</sup>	0.203 <sup>***</sup>
Item 3	<b>0.672</b> <sup>***</sup>	0.169 <sup>***</sup>	0.088 <sup>***</sup>
Social			
Item 4	0.237 <sup>***</sup>	0.273 <sup>***</sup>	<b>0.378</b> <sup>***</sup>
Item 5	0.288 <sup>***</sup>	<b>0.346</b> <sup>***</sup>	0.234 <sup>***</sup>
Item 6	0.041 <sup>***</sup>	<b>0.833</b> <sup>***</sup>	-0.004
Item 7	0.105 <sup>***</sup>	<b>0.652</b> <sup>***</sup>	0.018 <sup>**</sup>
Item 8	0.013 <sup>*</sup>	<b>0.733</b> <sup>***</sup>	-0.007
Psychological			
Item 9	<b>0.316</b> <sup>***</sup>	0.139 <sup>***</sup>	<b>0.455</b> <sup>***</sup>
Item 10	0.210 <sup>***</sup>	0.134 <sup>***</sup>	<b>0.461</b> <sup>***</sup>
Item 11	<b>0.312</b> <sup>***</sup>	0.171 <sup>***</sup>	<b>0.405</b> <sup>***</sup>
Item 12	0.071 <sup>***</sup>	0.120 <sup>***</sup>	<b>0.619</b> <sup>***</sup>
Item 13	0.124 <sup>***</sup>	0.058 <sup>***</sup>	<b>0.628</b> <sup>***</sup>
Item 14	0.183 <sup>***</sup>	0.144 <sup>***</sup>	<b>0.611</b> <sup>***</sup>

*Note.* Loadings that are larger than .30 are shown in boldface.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .01$

Table 8  
*Standardized Factor Loading for the Three-Factor ESEM  
 Models Using Geomin Rotation ( $\epsilon = .5$ )*

	Emotional	Social	Psychological
Emotional			
Item 1	<b>0.863</b> ***	0.051***	-0.031***
Item 2	<b>0.632</b> ***	0.072***	0.207***
Item 3	<b>0.679</b> ***	0.146***	0.090***
Social			
Item 4	0.227***	0.252***	<b>0.392</b> ***
Item 5	0.284***	<b>0.329</b> ***	0.244***
Item 6	0.039***	<b>0.828</b> ***	0.009
Item 7	0.104***	<b>0.645</b> ***	0.028***
Item 8	0.011	<b>0.730</b> ***	0.004
Psychological			
Item 9	<b>0.306</b> ***	0.114***	<b>0.469</b> ***
Item 10	0.198***	0.113***	<b>0.476</b> ***
Item 11	<b>0.303</b> ***	0.148***	<b>0.418</b> ***
Item 12	0.052***	0.097***	<b>0.639</b> ***
Item 13	0.105***	0.034***	<b>0.647</b> ***
Item 14	0.165***	0.118***	<b>0.630</b> ***

*Note.* Loadings that are larger than .30 are shown in boldface.  
 \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .01$

Table 9  
*ESEM Factor Correlations for Different Rotation Criteria*

	Emotional	Social
Geomin $\epsilon = .5$		
Emotional	-	
Social	0.427	-
Psychological	0.560	0.381
Target rotation		
Emotional	-	
Social	0.620	-
Psychological	0.759	0.609
CF-facparsim		
Emotional	-	
Social	0.406	-
Psychological	0.523	0.358
CF-varimax		
Emotional	-	
Social	0.498	-
Psychological	0.629	0.445

*Note.* All estimates are significant at  $p < .001$ .

Table 10  
Samples sizes in the measurement invariance testing

	Total sample size	Group	Group size
Gender	23622	Female	14946
		Male	8676
Nationality	23657	USA	22039
		International	1618
Sexual orientation	23674	Heterosexual	21866
		Other	1808

## Appendix 1. The MHC-SF

The following questions are about how you have been feeling during the past month. Place a check mark in the box that best represents how often you have experienced or felt the following:

During the past month, how often did you feel ...	NEVER	ONCE OR TWICE	ABOUT ONCE A WEEK	ABOUT 2 OR 3 TIMES A WEEK	ALMOST EVERY DAY	EVERY DAY
1. happy						
2. interested in life						
3. satisfied						
4. that you had something important to contribute to society						
5. that you belonged to a community (like a social group, or your neighborhood)						
6. that our society is becoming a better place for people like you						
7. that people are basically good						
8. that the way our society works makes sense to you						
9. that you liked most parts of your personality						
10. good at managing the responsibilities of your daily life						
11. that you had warm and trusting relationships with others						
12. that you had experiences that challenged you to grow and become a better person						
13. confident to think or express your own ideas and opinions						
14. that your life has a sense of direction or meaning to it						