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## Societal emotional environments and cross-cultural differences in life satisfaction: a forty-nine country study

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A Forty-Nine Country Study

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### **S1. Power Analysis**

In power analyses, one must provide at least four of five criteria: the number of variables, number of observations, effect size, significance level ( $\alpha$ ), and/or power ( $1-\beta$ ). This study has one between-subjects categorical variable (country) with 49 levels (considering that Bulgaria's data were not analysed), and five continuous variables (i.e., SWLS, experience of positive emotion, experience of negative emotion, expression of positive emotion, expression of negative emotion). Using G\*Power version 3.0.10 (Faul, Erdfelder, Lang, & Buchner, 2007), based on the statistical power analysis proposed by Cohen (1992), and following Snijders (2005) recommendation to test for the prediction of life satisfaction (SWLS) in a multilevel modelling simulation, we found that a total of 4,311 participants from 49 countries would be sufficient in this research to observe a "small" to "medium" effect size ( $\omega^2 = .04$ ; Cohen, 1977) with  $\alpha = .05$  to obtain a desired power of .80. Although a "medium" effect ( $\omega^2 = .20$ ) appears to reflect the average effect size reported in psychological research (Richard, Bond Jr., & Stokes-Zoota, 2003; Sedlmeir & Gigerenzer, 1989), in this study we estimated power for a "small" ( $\omega^2 = .02$ ) to "medium" ( $\omega^2 = .10$ ) effect following Cohen's (1977) classification and caution that "what a sociologist may consider a small effect size may well be appraised as medium by a psychologist" (p. 285). When the power analysis was recalculated using the actual sample of 12,888 valid responses, we found that the power obtained for country was .99, as was the power for positive and negative emotion expression as predictors of SWLS. When the statistical power was calculated per country alone (and not for the entire sample) and with the same criteria described above, it was observed that 116 participants would have been sufficient in order to obtain a statistical power of .80. When power was recalculated for the average country

sample size ( $N = 259$ ), we obtained a power of .95 for the five within-subjects continuous variables. Thus, the samples sizes provided more than satisfactory power.

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**S2. Samples' Characteristics**Table S1. *Samples' Characteristics*

Country	Sample Size Collected	Sample Size Analyzed <sup>a</sup>	Sample Type	Gender	Mean Age ( <i>SD</i> )	Reliability Index (Cronbach's $\alpha$ )	Means (and <i>SDs</i> ) of Measures
Argentina	175	175	100% Students	74.1% Female	M = 32.4 (11.35)	SWLS = .72	SWLS: M=5.7 (1.31)
						EXPE=.75	EXPE: M=5.4 (1.12)
						EXNE=.82	EXNE: M=3.8 (1.20)
						PSEE=.78	PSEE: M=5.3 (1.19)
						NSEE=.82	NSEE: M=3.5 (1.20)
Australia	354	320	43.2% Students	62.6% Female	M=27.6 (9.77)	SWLS=.85	SWLS: M=4.8 (1.67)
						EXPE=.90	EXPE: M=4.6 (1.30)
						EXNE=.88	EXNE: M=4.4 (1.27)
						PSEE=.89	PSEE: M=4.6 (1.26)
						NSEE=.89	NSEE: M=4.2 (1.32)
			56.8% General Population	52.8% Female	M=45.6 (17.01)	SWLS=.91	SWLS: M=4.8 (2.01)
						EXPE=.92	EXPE: M=4.7 (1.45)

						EXNE=.93	EXNE: M=3.6 (1.48)
						PSEE=.92	PSEE: M=4.6 (1.53)
						NSEE=.93	NSEE: M=3.5 (1.48)
Austria	324	320	66.9% Students	80.8% Female	M=24.3 (5.52)	SWLS=.87	SWLS: M=4.6 (1.50)
						EXPE=.88	EXPE: M=4.8 (1.67)
						EXNE=.86	EXNE: M=4.6 (1.30)
						PSEE=.89	PSEE: M=4.2 (1.19)
						NSEE=.88	NSEE: M=4.4 (1.27)
			29.7% General Population	77.9% Female	M=37.8 (11.88)	SWLS=.90	SWLS: M=4.7 (1.57)
						EXPE=.89	EXPE: M=4.8 (1.30)
						EXNE=.90	EXNE: M=4.6 (1.28)
						PSEE=.89	PSEE: M=4.7 (1.50)
						NSEE=.89	NSEE: M=4.3 (1.38)
Brazil	616	606	55.4% Students	57.0% Female	M=24.8 (6.91)	SWLS=.82	SWLS: M=4.9 (1.58)
						EXPE=.86	EXPE: M=5.6 (1.27)
						EXNE=.87	EXNE: M=4.3 (1.36)
						PSEE=.86	PSEE: M=5.5 (1.33)
						NSEE=.86	NSEE: M=4.0 (1.33)



			44.6% General Population	51.1% Female	M=30.7 (12.33)	SWLS=.84 EXPE=.87 EXNE=.87 PSEE=.86 NSEE=.86	SWLS: M=5.4 (1.38) EXPE: M=5.7 (1.27) EXNE: M=4.7 (1.13) PSEE: M=5.6 (1.21) NSEE: M=4.2 (1.22)
Bulgaria	222	0	<i>The emotion measures were not administered in the Bulgarian sample. Hence, in the present study, data from Bulgaria were excluded from the analyses.</i>				
Buthan	121	119	100% Students	61.3% Female	M=22.6 (2.42)	SWLS=.75 EXPE=.86 EXNE=.89 PSEE=.86 NSEE=.88	SWLS: M=4.7 (1.45) EXPE: M=4.9 (1.04) EXNE: M=4.5 (1.20) PSEE: M=4.9 (1.06) NSEE: M=4.3 (1.16)
Canada	248	240	100% Students	71.7% Female	M=21.8 (4.76)	SWLS=.86 EXPE=.90 EXNE=.88 PSEE=.89 NSEE=.89	SWLS: M=5.4 (1.54) EXPE: M=4.9 (1.18) EXNE: M=4.0 (1.05) PSEE: M=4.8 (1.18) NSEE: M=3.7 (1.08)
Chile	221	221	100% Students	55.3% Female	M=21.5 (3.10)	SWLS=.87 EXPE=.89 EXNE=.86	SWLS: M=5.8 (1.64) EXPE: M=5.5 (1.22) EXNE: M=4.4 (1.12)

						PSEE=.88	PSEE: M=5.3 (1.25)
						NSEE=.85	NSEE: M=3.9 (1.12)
China	200	199	100% Students	71.7% Female	M=20.6 (4.69)	SWLS=.83	SWLS: M=5.2 (1.51)
						EXPE=.92	EXPE: M=5.5 (1.19)
						EXNE=.90	EXNE: M=3.9 (1.13)
						PSEE=.93	PSEE: M=5.0 (1.42)
						NSEE=.89	NSEE: M=3.4 (1.12)
Colombia	476	466	100% Students	51.1% Female	M=32.9 (12.36)	SWLS=.83	SWLS: M=5.8 (1.53)
						EXPE=.88	EXPE: M=5.8 (1.34)
						EXNE=.88	EXNE: M=3.8 (1.29)
						PSEE=.87	PSEE: M=5.7 (1.32)
						NSEE=.88	NSEE: M=3.6 (1.32)
Croatia	143	140	100% Students	84.3% Female	M=30.7 (11.12)	SWLS=.85	SWLS: M=5.9 (1.47)
						EXPE=.90	EXPE: M=4.8 (1.27)
						EXNE=.91	EXNE: M=3.6 (1.11)
						PSEE=.91	PSEE: M=4.7 (1.35)
						NSEE=.87	NSEE: M=3.2 (0.94)
Czech Republic	201	201	100% Students	51.0% Female	M=22.2 (3.47)	SWLS=.83	SWLS: M=5.7 (1.59)
						EXPE=.87	EXPE: M=5.3 (1.13)
						EXNE=.86	EXNE: M=4.2 (1.01)

						PSEE=.86	PSEE: M=5.2 (1.13)
						NSEE=.86	NSEE: M=3.7 (1.05)
Estonia	201	200	100% Students	71.2% Female	M=28.8 (10.52)	SWLS=.83	SWLS: M=5.6 (1.49)
						EXPE=.88	EXPE: M=4.9 (1.20)
						EXNE=.85	EXNE: M=4.2 (1.26)
						PSEE=.88	PSEE: M=5.1 (1.43)
						NSEE=.88	NSEE: M=4.2 (1.23)
France	216	216	100% Studying General Population	83.4% Female	M=31.7 (10.44)	SWLS=.85	SWLS: M=5.6 (1.46)
						EXPE=.86	EXPE: M=4.9 (1.05)
						EXNE=.89	EXNE: M=3.4 (1.00)
						PSEE=.87	PSEE: M=4.5 (1.16)
						NSEE=.86	NSEE: M=2.9 (0.85)
Georgia	236	234	100% Students	53.4% Female	M=20.0 (2.56)	SWLS=.79	SWLS: M=5.1 (1.50)
						EXPE=.79	EXPE: M=4.7 (0.97)
						EXNE=.84	EXNE: M=3.8 (1.00)
						PSEE=.82	PSEE: M=4.5 (1.10)
						NSEE=.81	NSEE: M=3.3 (0.96)
Germany	108	106	100% Students	81.4% Female	M=22.3 (3.42)	SWLS=.84	SWLS: M=6.0 (1.41)
						EXPE=.85	EXPE: M=5.3 (0.97)
						EXNE=.82	EXNE: M=3.7 (1.03)

						PSEE=.86	PSEE: M=5.3 (1.05)
						NSEE=.88	NSEE: M=3.3 (0.98)
Ghana	267	266	100% Students	52.3% Female	M=22.2 (2.35)	SWLS=.78	SWLS: M=5.0 (1.60)
						EXPE=.87	EXPE: M=6.2 (1.26)
						EXNE=.87	EXNE: M=3.9 (1.19)
						PSEE=.87	PSEE: M=6.2 (1.22)
						NSEE=.87	NSEE: M=3.8 (1.24)
Greece	430	427	53.6% Students	59.8% Female	M=23.9 (5.71)	SWLS=.81	SWLS: M=5.5 (1.52)
						EXPE=.90	EXPE: M=5.1 (1.31)
						EXNE=.90	EXNE: M=4.2 (1.26)
						PSEE=.90	PSEE: M=5.1 (1.34)
						NSEE=.88	NSEE: M=3.6 (1.13)
			46.4% General Population	59.1% Female	M=25.6 (5.71)	SWLS=.85	SWLS: M=5.5 (1.52)
						EXPE=.89	EXPE: M=5.0 (1.21)
						EXNE=.87	EXNE: M=3.8 (1.04)
						PSEE=.90	PSEE: M=4.9 (1.33)
						NSEE=.86	NSEE: M=3.4 (1.04)
Guatemala	138	111	100% Students	70.4% Female	M=20.5 (2.37)	SWLS=.79	SWLS: M=6.1 (1.48)
						EXPE=.87	EXPE: M=6.0 (1.24)

						EXNE=.83	EXNE: M=4.9 (1.22)
						PSEE=.83	PSEE: M=5.7 (1.25)
						NSEE=.84	NSEE: M=4.2 (1.23)
Hong Kong	291	291	100% Students	37.1% Female	M=21.1 (2.23)	SWLS=.88	SWLS: M=4.5 (1.55)
						EXPE=.90	EXPE: M=4.2 (1.27)
						EXNE=.89	EXNE: M=3.6 (1.03)
						PSEE=.86	PSEE: M=4.2 (1.23)
						NSEE=.86	NSEE: M=3.3 (0.90)
Hungary	834	831	100% Students	73.2% Female	M=20.8 (2.39)	SWLS=.85	SWLS: M=6.2 (1.51)
						EXPE=.87	EXPE: M=5.4 (1.10)
						EXNE=.86	EXNE: M=4.2 (1.01)
						PSEE=.88	PSEE: M=5.2 (1.19)
						NSEE=.85	NSEE: M=3.6 (0.96)
Iceland	354	353	79.0% Students	77.1% Female	M=27.6 (9.51)	SWLS=.85	SWLS: M=6.2 (1.29)
						EXPE=.87	EXPE: M=4.7 (1.16)
						EXNE=.86	EXNE: M=3.6 (1.06)
						PSEE=.88	PSEE: M=4.3 (1.39)
						NSEE=.84	NSEE: M=2.8 (0.91)
			21.0% General Population	90.5% Female	M=43.2 (10.31)	SWLS=.86	SWLS: M=6.3 (1.26)
						EXPE=.88	EXPE: M=4.9 (1.11)

						EXNE=.85	EXNE: M=3.2 (1.10)
						PSEE=.89	PSEE: M=4.5 (1.27)
						NSEE=.85	NSEE: M=2.6 (0.89)
Indonesia	198	198	100% Students	52.3% Female	M=26.7 (11.8)	SWLS=.71	SWLS: M=5.5 (1.58)
						EXPE=.88	EXPE: M=6.0 (1.26)
						EXNE=.85	EXNE: M=5.7 (1.28)
						PSEE=.90	PSEE: M=6.0 (1.38)
						NSEE=.87	NSEE: M=5.7 (1.26)
Iran	200	199	100% Students	48.2% Female	M=34.4 (9.44)	SWLS=.87	SWLS: M=5.0 (1.66)
						EXPE=.88	EXPE: M=5.1 (1.21)
						EXNE=.86	EXNE: M=3.9 (1.10)
						PSEE=.88	PSEE: M=5.0 (1.30)
						NSEE=.87	NSEE: M=3.5 (1.23)
Ireland	245	244	100% Students	59.5% Female	M=20.9 (3.17)	SWLS=.82	SWLS: M=5.8 (1.48)
						EXPE=.85	EXPE: M=5.3 (1.05)
						EXNE=.85	EXNE: M=4.3 (1.06)
						PSEE=.86	PSEE: M=5.1 (1.13)
						NSEE=.85	NSEE: M=3.7 (1.10)
Italy	290	288	100% Students	53.5% Female	M=25.1 (4.50)	SWLS=.86	SWLS: M=5.5 (1.50)
						EXPE=.88	EXPE: M=5.6 (1.26)

						EXNE=.91	EXNE: M=4.2 (1.33)
						PSEE=.89	PSEE: M=5.8 (1.35)
						NSEE=.87	NSEE: M=4.0 (1.23)
Japan	200	198	100% Students	38.9% Female	M=19.5 (1.23)	SWLS=.80	SWLS: M=4.1 (1.48)
						EXPE=.86	EXPE: M=4.4 (1.11)
						EXNE=.86	EXNE: M=4.2 (1.15)
						PSEE=.88	PSEE: M=4.2 (1.23)
						NSEE=.88	NSEE: M=3.8 (1.22)
Korea	209	208	100% Students	47.6% Female	M=22.4 (3.52)	SWLS=.85	SWLS: M=4.8 (1.49)
						EXPE=.89	EXPE: M=5.1 (1.09)
						EXNE=.90	EXNE: M=4.3 (1.14)
						PSEE=.91	PSEE: M=4.9 (1.23)
						NSEE=.88	NSEE: M=4.0 (1.13)
Lithuania	298	296	75.7% Students	74.4% Female	M=20.7 (4.17)	SWLS=.83	SWLS: M=6.0 (1.45)
						EXPE=.82	EXPE: M=5.3 (0.93)
						EXNE=.86	EXNE: M=4.4 (0.94)
						PSEE=.85	PSEE: M=5.2 (1.05)
						NSEE=.87	NSEE: M=3.9 (0.95)
			24.3% General Population	70.4% Female	M=41.3 (10.89)	SWLS=.89	SWLS: M=5.8 (1.74)

						EXPE=.84	EXPE: M=5.8 (1.13)
						EXNE=.82	EXNE: M=3.5 (0.89)
						PSEE=.83	PSEE: M=5.5 (1.08)
						NSEE=.84	NSEE: M=3.3 (0.98)
Luxembourg	223	220	79.1% Students	64.5% Female	M=22.5 (3.65)	SWLS=.80	SWLS: M=5.8 (1.46)
						EXPE=.88	EXPE: M=5.2 (1.17)
						EXNE=.91	EXNE: M=4.2 (1.90)
						PSEE=.88	PSEE: M=5.1 (1.25)
						NSEE=.85	NSEE: M=3.6 (1.02)
			18.2% General Population	85.0% Female	M=39.5 (13.10)	SWLS=.89	SWLS: M=6.3 (1.67)
						EXPE=.88	EXPE: M=5.0 (1.14)
						EXNE=.84	EXNE: M=3.4 (1.09)
						PSEE=.89	PSEE: M=4.9 (1.23)
						NSEE=.91	NSEE: M=3.1 (1.08)
Malaysia	190	190	100% Students	67.9% Female	M=20.8 (1.61)	SWLS=.80	SWLS: M=5.5 (1.36)
						EXPE=.89	EXPE: M=5.8 (1.16)
						EXNE=.89	EXNE: M=4.6 (1.20)
						PSEE=.89	PSEE: M=5.7 (1.22)
						NSEE=.85	NSEE: M=4.2 (1.07)



Mexico	181	175	100% Students	56.3% Female	M=20.8 (3.91)	SWLS=.86 EXPE=.91 EXNE=.85 PSEE=.91 NSEE=.82	SWLS: M=6.2 (1.64) EXPE: M=5.4 (1.31) EXNE: M=4.1 (1.09) PSEE: M=5.2 (1.44) NSEE: M=3.6 (1.02)
Nigeria	158	137	100% Students	82.3% Female	M=19.8 (1.50)	SWLS=.86 EXPE=.91 EXNE=.91 PSEE=.91 NSEE=.90	SWLS: M=4.3 (1.67) EXPE: M=5.1 (1.74) EXNE: M=4.1 (1.43) PSEE: M=5.5 (1.43) NSEE: M=4.0 (1.40)
Netherlands	194	194	100% Students	9.8% Female	M=19.4 (1.84)	SWLS=.81 EXPE=.85 EXNE=.87 PSEE=.87 NSEE=.84	SWLS: M=5.9 (1.34) EXPE: M=4.8 (0.90) EXNE: M=3.7 (0.79) PSEE: M=4.6 (0.98) NSEE: M=3.2 (0.71)
Norway	252	250	100% Students	78.7% Female	M=22.6 (4.82)	SWLS=.90 EXPE=.87 EXNE=.86 PSEE=.89 NSEE=.83	SWLS: M=5.8 (1.68) EXPE: M=4.6 (1.08) EXNE: M=3.6 (0.90) PSEE: M=4.5 (1.18) NSEE: M=2.9 (0.70)

Pakistan	251	240	100% Students	46.9% Female	M=21.78 (3.45)	SWLS=.75 EXPE=.86 EXNE=.87 PSEE=.86 NSEE=.86	SWLS: M=5.1 (1.57) EXPE: M=5.5 (1.20) EXNE: M=4.7 (1.27) PSEE: M=5.5 (1.18) NSEE: M=4.4 (1.27)
Poland	494	472	51.9% Students	80.4% Female	M=22.5 (2.63)	SWLS=.84 EXPE=.86 EXNE=.90 PSEE=.85 NSEE=.88	SWLS: M=4.4 (1.51) EXPE: M=4.5 (1.13) EXNE: M=3.9 (1.12) PSEE: M=4.5 (1.13) NSEE: M=3.5 (1.00)
			48.1% General Population	55.9% Female	M=43.3 (14.87)	SWLS=.86 EXPE=.89 EXNE=.92 PSEE=.90 NSEE=.94	SWLS: M=4.1 (1.34) EXPE: M=4.2 (1.27) EXNE: M=3.2 (1.15) PSEE: M=4.2 (1.30) NSEE: M=3.1 (1.21)
Portugal	264	260	59.6% Students	64.9% Female	M=21.5 (6.15)	SWLS=.83 EXPE=.89 EXNE=.83 PSEE=.87	SWLS: M=5.7 (1.48) EXPE: M=5.7 (1.21) EXNE: M=4.2 (1.06) PSEE: M=5.7 (1.23)

						NSEE=.85	NSEE: M=3.7 (1.11)
			40.4% General Population	67.3% Female	M=39.1 (12.35)	SWLS=.87	SWLS: M=5.9 (1.44)
						EXPE=.88	EXPE: M=5.4 (1.16)
						EXNE=.85	EXNE: M=3.4 (1.00)
						PSEE=.90	PSEE: M=5.3 (1.27)
						NSEE=.84	NSEE: M=3.1 (1.03)
Romania	291	290	100% Students	49.8% Female	M=22.3 (6.11)	SWLS=.84	SWLS: M=6.0 (1.48)
						EXPE=.89	EXPE: M=5.7 (1.19)
						EXNE=.90	EXNE: M=3.8 (1.14)
						PSEE=.89	PSEE: M=5.5 (1.25)
						NSEE=.90	NSEE: M=3.5 (1.17)
Russia	275	270	100% Students	63.0% Female	M=19.7 (1.56)	SWLS=.76	SWLS: M=4.5 (1.42)
						EXPE=.86	EXPE: M=5.1 (1.48)
						EXNE=.88	EXNE: M=4.1 (1.23)
						PSEE=.85	PSEE: M=5.0 (1.14)
						NSEE=.87	NSEE: M=3.8 (1.21)
El Salvador	240	240	100% Students	58.2% Female	M=26.9 (8.72)	SWLS=.81	SWLS: M=5.9 (1.60)
						EXPE=.83	EXPE: M=5.9 (1.19)
						EXNE=.85	EXNE: M=4.4 (1.33)

						PSEE=.82	PSEE: M=5.8 (1.20)
						NSEE=.85	NSEE: M=4.2 (1.35)
Saudi Arabia	186	178	100% Students	80.8% Female	M=39.4 (13.43)	SWLS=.81	SWLS: M=5.7 (1.67)
						EXPE=.92	EXPE: M=5.5 (1.56)
						EXNE=.88	EXNE: M=3.7 (1.19)
						PSEE=.93	PSEE: M=5.1 (1.76)
						NSEE=.86	NSEE: M=3.2 (1.13)
Serbia	211	210	100% Students	50.5% Female	M=20.1 (1.58)	SWLS=.84	SWLS: M=6.1 (1.43)
						EXPE=.88	EXPE: M= 5.4 (1.23)
						EXNE=.89	EXNE: M=3.9 (1.22)
						PSEE=.89	PSEE: M=5.1 (1.30)
						NSEE=.87	NSEE: M=3.2 (1.06)
Slovakia	311	311	100% Students	52.4% Female	M=21.5 (1.95)	SWLS=.79	SWLS: M=5.4 (1.52)
						EXPE=.83	EXPE: M=4.8 (1.16)
						EXNE=.86	EXNE: M=4.1 (1.10)
						PSEE=.83	PSEE: M=5.5 (1.09)
						NSEE=.83	NSEE: M=3.7 (0.99)
Switzerland	357	344	93.0% Students	20.3% Female	M=25.4 (5.34)	SWLS=.82	SWLS: M=6.2 (1.33)
						EXPE=.85	EXPE: M=4.9 (0.95)
						EXNE=.83	EXNE: M=3.4 (0.72)

						PSEE=.86	PSEE: M=4.6 (0.98)
						NSEE=.81	NSEE: M=2.9 (0.64)
			4.1% General Population				
				14.3% Female	M=37.4 (8.48)	SWLS=.83	SWLS: M=5.8 (1.09)
						EXPE=.92	EXPE: M=4.7 (1.12)
						EXNE=.80	EXNE: M=3.2 (0.68)
						PSEE=.90	PSEE: M=4.5 (1.09)
						NSEE=.58	NSEE: M=2.6 (0.38)
Taiwan	210	210	100% Students	64.3% Female	M=19.9 (1.41)	SWLS=.86	SWLS: M=4.6 (1.54)
						EXPE=.90	EXPE: M=4.8 (1.16)
						EXNE=.86	EXNE: M=3.7 (1.06)
						PSEE=.87	PSEE: M=4.7 (1.15)
						NSEE=.84	NSEE: M=3.3 (0.90)
Turkey	209	202	100% Students	53.0% Female	M=31.9 (11.68)	SWLS=.88	SWLS: M=5.5 (1.44)
						EXPE=.88	EXPE: M=5.7 (1.44)
						EXNE=.90	EXNE: M=3.9 (1.27)
						PSEE=.88	PSEE: M=5.6 (1.21)
						NSEE=.89	NSEE: M=3.6 (1.22)
UK	171	146	100% Students	30.5% Female	M=20.7 (3.04)	SWLS=.87	SWLS: M=5.3 (1.64)
						EXPE=.87	EXPE: M=4.3 (1.08)

						EXNE=.87	EXNE: M=3.6 (0.94)
						PSEE=.85	PSEE: M=4.2 (1.00)
						NSEE=.86	NSEE: M=3.1 (0.86)
Ukraine	211	210	100% Students	55.1% Female	M=19.2 (2.25)	SWLS=.76	SWLS: M=4.7 (1.59)
						EXPE=.82	EXPE: M=5.3 (1.13)
						EXNE=.87	EXNE: M=4.2 (1.01)
						PSEE=.80	PSEE: M=5.2 (1.13)
						NSEE=.84	NSEE: M=4.7 (1.05)
USA	458	446	100% Students	70.3% Female	M=21.3 (5.80)	SWLS=.89	SWLS: M=5.3 (1.80)
						EXPE=.88	EXPE: M=5.2 (1.21)
						EXNE=.90	EXNE: M=4.1 (1.24)
						PSEE=.87	PSEE: M=5.2 (1.24)
						NSEE=.88	NSEE: M=3.7 (1.13)
AVERAGE	261	259	83.5% Students	58.7% Female	M=23.1 (6.40)	SWLS=.81	SWLS: M=5.2 (0.92)
						EXPE=.87	EXPE: M=5.3 (1.24)
						EXNE=.86	EXNE: M=4.1 (1.19)
						PSEE=.86	PSEE: M=5.1 (1.31)
						NSEE=.87	NSEE: M=3.7 (1.17)
			14.8% General Population	59.7% Female	M=35.7 (13.89)	SWLS=.89	SWLS: M=5.6 (1.07)

						EXPE=.89	EXPE: M=5.3 (1.37)
						EXNE=.88	EXNE: M=3.8 (1.28)
						PSEE=.90	PSEE: M=5.2 (1.39)
						NSEE=.86	NSEE: M= 3.5 (1.26)
						SWLS=.86	SWLS: M=5.6 (1.01)
						EXPE=.86	EXPE: M=4.9 (1.06)
						EXNE=.90	EXNE: M=3.4 (1.00)
						PSEE=.90	PSEE: M=4.6 (1.16)
						NSEE=.89	NSEE: M=3.0 (0.84)
TOTAL	13,353	12,888	83.5% Students	60.1% Female	M=23.22 (6.91)	SWLS=.86	SWLS: M=5.6 (1.53)
						EXPE=.88	EXPE: M=5.2 (1.25)
						EXNE=.88	EXNE: M=4.1 (1.20)
						PSEE=.88	PSEE: M=5.1 (1.32)
						NSEE=.88	NSEE: M=3.7 (1.18)
						SWLS=.87	SWLS: M=5.5 (1.61)
						EXPE=.90	EXPE: M=5.3 (1.40)
						EXNE=.90	EXNE: M=3.8 (1.31)
						PSEE=.89	PSEE: M=5.2 (1.41)

				NSEE=.90	NSEE: M= 3.5 (1.30)
	1.7% Studying	82.1% Female	M=31.7 (10.12)	SWLS=.84	SWLS: M=5.8 (1.37)
	General			EXPE=.86	EXPE: M=5.3 (1.20)
	Population			EXNE=.88	EXNE: M=3.4 (0.86)
				PSEE=.87	PSEE: M=4.9 (1.21)
				NSEE=.85	NSEE: M=2.9 (0.88)

*Note.* SWLS = Satisfaction with Life Scale; EXPE = Experience of positive emotions; EXNE= Experience of negative emotions; PSEE = Expression of positive emotions; NSEE = Expression of negative emotions. “Studying General Population” refer to older adult students, as opposed to typical college/university students; <sup>a</sup>In addition to excluding the whole Bulgarian sample from our analyses because the emotion part of the questionnaire was not administered in this sample, after data screening we also excluded 223 participants (i.e., approximately 2% of the overall sample) for duplicate responses and invalid response patterns (such as “Christmas Tree” responses or no variance in responses). See supplementary material S5 for exclusion syntax.



### **S3. Measurement Models Testing Invariance and Isomorphism**

Our main analyses rely on the assumption that the meanings of items measuring positive and negative emotional experience and expression, as well as satisfaction with life, are similar enough to be comparable not only across samples from very different cultural clusters (i.e., *cross-cultural invariance*: van de Vijver & Leung, 1997) but also across individual and societal levels of analysis (i.e., *multilevel isomorphism*: Fontaine & Fischer, 2011). We tested the cross-cultural invariance and multi-level isomorphism of these five measures through parallel series of multilevel confirmatory factor analyses (CFA) using Mplus Version 6 software (Muthén & Muthén, 2010). We assessed model fit using the Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standard Root Mean Squared Residual (SRMR). Values of CFI > .95 (or > .90), RMSEA < .06 (or < .08), and SRMR < .08 (or < .10) have been proposed as criteria for “good” (or “acceptable”) fit (Hu & Bentler, 1999; Kline, 2005). However, these rules of thumb should not be understood as absolute criteria for accepting or rejecting a model (Marsh, Hau, & Wen, 2004), and they may not be realistic for complex models involving many diverse cultural samples.

For each measure, we computed analyses in four stages, designed to investigate whether the scale items were behaving comparably across samples from different cultural clusters (i.e. cross-cultural metric invariance of the within-sample factor loadings) as well as across levels of analysis (i.e. isomorphism of the within-sample and between-sample factor loadings). We based these analyses on recommendations for validating measures of multilevel constructs (Tay, Woo, & Vermunt, 2014), but we included an additional step designed to assess invariance of the within-sample loadings across samples from different cultural clusters (adapted from Vignoles et al., 2016). Stages 1 and 2 focused on the within-sample factorial structure of each measure; for

these models, we centred the item ratings within samples and specified parameters at the within-samples level only, while leaving the between-samples level empty. Stages 3 and 4 focused on comparing the within-samples and between-samples factorial structures; for these models, we did not centre the item ratings, and we allowed Mplus to decompose the variance of each item into the two levels of analysis.

*Stage 1* was designed to establish the pooled within-samples structure of each measure. In these models, we allowed all relevant items to load on a single factor representing the construct of interest at the within-samples level only. For the four emotion measures, our initial models included covariances among items originating from the Affect Valuation Index (AVI), based on the known factorial structure of these items (e.g., Tsai et al., 2006). Thus, we allowed covariances among groups of AVI items measuring low arousal negative emotions (sleepy, dull, sluggish), high arousal negative emotions (fearful, hostile, nervous), low arousal positive emotions (calm, relaxed, peaceful, serene), and high arousal positive emotions (enthusiastic, excited, elated, euphoric). Fit indices were acceptable for positive emotional experience and expression and for the SWLS, and marginally acceptable for negative emotional experience and expression (Table S2). All items loaded as expected on their target factors (all standardized  $\lambda \geq .371$ ; all  $p < .001$ ; see Table S3).

Large modification indices suggested adding covariances among two pairs of negative emotions (ashamed and embarrassed: both self-conscious negative emotions; hateful and hostile: both aggressive negative emotions) and one pair of positive emotions (authentic and respectful: both complex social emotions that may regulate behaving appropriately towards others). These covariances were theoretically plausible, and they yielded large improvements in fit to both experience and expression measures

(Table S2: all  $\Delta\chi^2 < 1000$ ; all fit indices now acceptable or good). Hence, we included them in modified Stage 1 models and retained them in all subsequent models.

In *Stage 2*, we tested whether the within-samples factorial structure of each measure would be comparable across groups of samples from diverse world regions. Although multi-group CFAs with 49 separate samples would not have been statistically feasible, we were able to conduct multi-group multilevel CFAs comparing the structure of each measure across cultural clusters of samples (see Vignoles et al., 2016, for a similar approach). We tested models where all item loadings were constrained to be equal across the 10 cultural clusters sampled in our study (see Method section in main text).<sup>1</sup> All values of SRMR were  $\leq .06$  indicating good fit, all values of RMSEA were  $< .08$  indicating acceptable fit, and all values of CFI were  $> .89$  indicating marginal or acceptable fit. Since the fit of the constrained models was broadly acceptable, it was tenable to assume that the factorial structures of all five measures were comparable across the 10 cultural clusters (Little, Card, Slegers, & Ledford, 2007).

In *Stage 3*, we tested for *configural isomorphism* across within-culture and between-culture levels of analysis: Weak configural isomorphism entails that a similar set of items loads on the corresponding within-samples and between-samples factors without fixing loading patterns; strong configural isomorphism entails that an identical set of items loads on the corresponding within-level and between-level factors without

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<sup>1</sup> This step is equivalent to establishing metric invariance (i.e. invariance of loadings) in multigroup CFA of a single-level construct. Note that scalar invariance (i.e. invariance of intercepts) in multi-group analyses of an individual-level measure has no equivalent when validating a multi-level construct, because group mean differences in items and constructs are modelled at the higher level of analysis (Tay et al., 2014).

fixing loading patterns (Tay et al., 2014). In the Stage 3 models, we allowed all items to load freely on parallel factors at the within-samples level and the between-samples level. All five models showed clear evidence of strong configural invariance, whereby every item loaded significantly and substantially on its target factor at both levels of analysis (all standardized  $\lambda$ 's  $\geq .368$ ; all  $p < .01$ ; see Table S3).

We now tested for *metric isomorphism* across within-culture and between-culture levels of analysis: Weak metric isomorphism entails that items load with similar magnitude on the corresponding within-level and between-level factors; strong metric isomorphism entails that items load with identical magnitude on the corresponding within-level and between-level factors (Tay et al., 2014). As recommended by Tay et al., we tested for weak metric isomorphism by using the congruence coefficient (Tucker's  $\phi$ ) to compare the patterns of freely estimated within-level and between-level loadings on each measure in our Stage 3 models. Lorenzo-Seva and ten Berge (2006) recommend that values of Tucker's  $\phi$  above .85 indicate "a fair similarity", while values above .95 indicate "that the two factors or components compared can be considered equal". For our five measures, all values of Tucker's  $\phi$  were above .95, providing unequivocal evidence for weak metric isomorphism.

In *Stage 4*, we conducted a final test for strong metric isomorphism by constraining the loadings of each item to be equal across both levels of analysis. All five models showed a significant loss of fit compared to the Stage 3 models:  $\Delta\chi^2$  (4 to 15) = 15.962 to 39.618, all  $p < .01$ . Nonetheless fit indices were acceptable for two of the Stage 4 models (satisfaction with life scale, negative emotional expression) and marginally acceptable for the other three Stage 4 models (positive emotional expression and experience, negative emotional experience).

In summary, we found that the structure of our measures was comparable, albeit not identical, across cultural clusters and across levels of analysis. Thus, the measures were suitable for use in our main analyses; we can reasonably expect that multilevel models using these measures will yield meaningful results.

#### **S4. Detailed Description of the Administered Questionnaire**

**A link to the original material, including the manual for collaborating researchers, is provided in supplemental materials S5.**

Materials were prepared in English and were translated from English into the dominant language of each country where the study was conducted. Following best practice, team leaders in each country were instructed to follow the back-translation procedure to establish linguistic equivalence.

The study described here is a part of a larger cross-cultural investigation in which other measures not directly related to this article were also administered (so they were not analyzed in the present study). They included the Interdependent Happiness Scale (IHS; Hitokoto & Uchida, 2015), adapted versions of the SWLS and IHS to measure family satisfaction with life and family interdependent happiness (Krys et al., 2019a; 2019b), adapted versions of the SWLS and IHS to measure ideal levels of individual/family satisfaction with life and ideal levels of individual/family interdependent happiness (Krys et al., 2019a; 2019b), and a new Multidimensional Self-Construal Scale (adapted from Vignoles et al., 2016). We also included items measuring satisfaction with several specific domains of life (e.g., friends, personal achievements), and additional items measuring the sociodemographic characteristics of participants (i.e., family structure, financial standing, living area, and time spent on volunteering activities). In some countries, additional measures were administered based on unique interests of team leaders (e.g., measures of honor-face-dignity logics were included in Poland and Italy).

**References for supplemental section on the administered questionnaire:**

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Table S2. *Fit indices and congruence coefficients from confirmatory factor analyses.*

Model	$\chi^2$	df	CFI	RMSEA	SRMR <sub>within</sub>	SRMR <sub>between</sub>	$\phi_{\text{raw}}$	$\phi_{\text{std}}$
<i>Stage 1 (multilevel models focusing on pooled within-sample structures)</i>								
Positive emotional experience (initial)	5535.105	108	.917	.062	.041	-	-	-
Positive emotional experience (modified)	4505.477	107	.932	.057	.037	-	-	-
Positive emotional expression (initial)	5035.232	108	.925	.060	.040	-	-	-
Positive emotional expression (modified)	3923.765	107	.942	.053	.036	-	-	-
Negative emotional experience (initial)	7962.705	85	.868	.085	.052	-	-	-
Negative emotional experience (modified)	4863.459	83	.920	.067	.043	-	-	-
Negative emotional expression (initial)	7774.986	85	.860	.084	.054	-	-	-
Negative emotional expression (modified)	4457.743	83	.920	.064	.043	-	-	-
Satisfaction with life	246.171	10	.991	.043	.019	-	-	-
<i>Stage 2 (multigroup multilevel models with equality constraints on within-sample loadings across 10 cultural clusters)</i>								
Positive emotional experience	7870.418	1205	.906	.066	.060	-	-	-
Positive emotional expression	7161.208	1205	.916	.062	.059	-	-	-
Negative emotional experience	7677.873	947	.894	.074	.059	-	-	-
Negative emotional expression	7027.930	947	.896	.071	.059	-	-	-
Satisfaction with life	575.354	136	.984	.050	.037	-	-	-
<i>Stage 3 (multilevel models with freely estimated within-sample and between-sample loadings)</i>								
Positive emotional experience	4669.866	182	.931	.044	.037	.089	.964	.976
Positive emotional expression	4116.385	182	.940	.041	.036	.084	.964	.974



Negative emotional experience	4984.637	138	.919	.052	.043	.069	.968	.987
Negative emotional expression	4584.631	138	.920	.050	.043	.053	.980	.992
Satisfaction with life	253.285	10	.991	.043	.019	.025	.987	.995
<i>Stage 4 (multilevel models with equality constraints on within-sample and between-sample loadings)</i>								
Positive emotional experience	4704.329	197	.931	.042	.037	.121	-	-
Positive emotional expression	4152.797	197	.940	.040	.036	.119	-	-
Negative emotional experience	5022.821	151	.919	.050	.042	.123	-	-
Negative emotional expression	4624.249	151	.919	.048	.043	.091	-	-
Satisfaction with life	269.247	14	.990	.038	.019	.086	-	-

Note. Values of  $\phi_{\text{raw}}$  compare the unstandardized loadings, whereas values of  $\phi_{\text{std}}$  compare the standardized loadings, across levels of analysis.

Table S3. *Standardized loadings from confirmatory factor analyses.*

	Stage 1					Stage 2							Stage 3		Stage 4	
	M1	M2	AN	LE	NE	GE	EE	LA	SS	ME	SA	CA	WS	BS	WS	BS
<i>Positive emotional experience</i>																
enthusiastic	.672	.677	.692	.726	.694	.670	.670	.655	.672	.724	.637	.700	.677	.908	.677	.903
excited	.577	.585	.647	.643	.600	.582	.573	.553	.630	.626	.536	.674	.585	.754	.586	.641
elated	.636	.644	.660	.689	.702	.667	.676	.574	.693	.749	.621	.717	.644	.576	.644	.606
euphoric	.511	.520	.539	.563	.592	.573	.549	.470	.500	.643	.537	.640	.520	.657	.520	.587
calm	.447	.445	.478	.455	.407	.430	.430	.442	.504	.495	.461	.454	.445	.569	.443	.732
relaxed	.531	.535	.550	.564	.532	.538	.544	.514	.562	.589	.534	.544	.535	.487	.533	.661
peaceful	.570	.569	.598	.574	.520	.554	.556	.560	.648	.625	.569	.569	.569	.586	.567	.718
serene	.503	.506	.521	.555	.457	.497	.528	.486	.509	.541	.476	.525	.506	.504	.505	.598
amused	.622	.627	.609	.685	.657	.669	.630	.588	.587	.721	.594	.694	.627	.425	.626	.625
proud	.561	.566	.635	.622	.582	.639	.592	.499	.505	.633	.579	.675	.566	.749	.566	.757
in_love	.371	.368	.371	.359	.323	.334	.342	.407	.432	.416	.402	.404	.368	.724	.368	.688
hopeful	.619	.620	.656	.645	.594	.631	.594	.584	.654	.692	.595	.691	.620	.942	.620	.936
respectful	.506	.478	.464	.487	.435	.420	.450	.504	.559	.546	.485	.524	.478	.722	.479	.477
grateful	.607	.599	.599	.614	.564	.602	.576	.602	.658	.636	.596	.615	.599	.781	.600	.730
self-confident	.650	.652	.654	.680	.640	.626	.636	.642	.684	.737	.624	.739	.652	.892	.652	.857
authentic	.517	.491	.471	.485	.459	.449	.453	.525	.578	.548	.527	.518	.491	.639	.490	.607

	Stage 1		Stage 2										Stage 3		Stage 4	
	M1	M2	AN	LE	NE	GE	EE	LA	SS	ME	SA	CA	WS	BS	WS	BS
<i>Positive emotional expression</i>																
enthusiastic	.679	.685	.697	.738	.736	.674	.674	.651	.665	.755	.645	.714	.685	.896	.684	.907
excited	.585	.595	.646	.647	.641	.611	.587	.541	.599	.661	.556	.676	.595	.759	.596	.656
elated	.628	.638	.646	.683	.729	.662	.660	.561	.661	.749	.635	.721	.638	.561	.638	.611
euphoric	.515	.524	.533	.568	.627	.581	.565	.463	.478	.623	.525	.641	.524	.661	.525	.610
calm	.433	.429	.454	.453	.404	.418	.419	.425	.476	.490	.448	.436	.429	.447	.428	.622
relaxed	.545	.548	.556	.573	.568	.537	.554	.514	.566	.623	.558	.560	.548	.542	.547	.687
peaceful	.563	.559	.581	.564	.553	.528	.549	.547	.622	.628	.567	.555	.559	.556	.558	.672
serene	.489	.490	.492	.523	.475	.477	.511	.459	.485	.520	.504	.506	.490	.435	.490	.553
amused	.604	.610	.597	.668	.653	.641	.605	.562	.567	.696	.593	.677	.610	.418	.609	.629
proud	.537	.543	.601	.600	.599	.594	.563	.471	.462	.613	.522	.654	.543	.770	.543	.760
in_love	.396	.395	.385	.388	.389	.381	.367	.410	.417	.464	.412	.430	.395	.803	.396	.735
hopeful	.618	.620	.646	.631	.619	.628	.601	.568	.647	.694	.593	.692	.620	.902	.619	.907
respectful	.545	.515	.493	.527	.490	.459	.489	.544	.574	.592	.491	.570	.515	.783	.516	.536
grateful	.625	.618	.613	.637	.638	.635	.599	.597	.652	.683	.607	.639	.618	.825	.619	.757
self-confident	.647	.649	.654	.679	.671	.614	.619	.631	.701	.752	.630	.726	.649	.909	.650	.887
authentic	.541	.511	.483	.492	.509	.465	.480	.537	.595	.556	.550	.545	.511	.664	.511	.661

	Stage 1		Stage 2										Stage 3		Stage 4	
	M1	M2	AN	LE	NE	GE	EE	LA	SS	ME	SA	CA	WS	BS	WS	BS
<i>Negative emotional experience</i>																
sad	.718	.732	.762	.773	.725	.722	.734	.712	.760	.732	.701	.735	.732	.851	.731	.912
sleepy	.429	.436	.459	.468	.453	.420	.440	.422	.428	.459	.445	.434	.436	.382†	.436	.434
dull	.617	.630	.653	.658	.595	.569	.620	.640	.689	.612	.635	.616	.630	.635	.630	.694
sluggish	.480	.484	.548	.518	.490	.459	.461	.466	.537	.505	.481	.475	.484	.532	.484	.498
fearful	.604	.601	.643	.623	.586	.564	.597	.571	.642	.661	.569	.652	.601	.812	.601	.820
hostile	.486	.458	.537	.505	.517	.461	.503	.417	.467	.525	.446	.520	.458	.791	.460	.546
nervous	.601	.600	.621	.609	.560	.554	.612	.597	.641	.626	.588	.616	.600	.641	.599	.756
depressed	.658	.666	.669	.690	.648	.674	.683	.625	.671	.714	.671	.685	.666	.694	.665	.772
bored	.557	.567	.579	.625	.510	.492	.564	.564	.590	.630	.574	.557	.567	.735	.567	.743
embarrassed	.603	.563	.605	.591	.552	.579	.552	.547	.608	.532	.494	.592	.563	.877	.565	.783
ashamed	.622	.583	.604	.586	.581	.619	.592	.535	.582	.602	.551	.625	.583	.802	.584	.634
hateful	.589	.575	.600	.616	.597	.571	.566	.536	.558	.632	.531	.590	.575	.806	.576	.662
angry	.630	.631	.689	.644	.639	.636	.640	.597	.641	.617	.550	.660	.631	.833	.632	.715
disgusted	.591	.586	.629	.618	.596	.591	.585	.543	.621	.604	.558	.613	.586	.808	.587	.692

	Stage 1		Stage 2										Stage 3		Stage 4	
	M1	M2	AN	LE	NE	GE	EE	LA	SS	ME	SA	CA	WS	BS	WS	BS
<i>Negative emotional expression</i>																
sad	.662	.675	.735	.688	.673	.676	.661	.659	.713	.650	.656	.682	.675	.922	.675	.944
sleepy	.411	.419	.450	.442	.407	.384	.410	.417	.462	.435	.445	.406	.419	.515	.419	.519
dull	.585	.598	.646	.606	.558	.516	.591	.602	.672	.565	.600	.578	.598	.690	.597	.759
sluggish	.465	.468	.537	.483	.460	.429	.426	.464	.539	.480	.498	.449	.468	.531	.467	.612
fearful	.601	.600	.669	.623	.592	.580	.583	.566	.636	.626	.569	.628	.600	.940	.599	.924
hostile	.489	.460	.557	.474	.506	.463	.498	.422	.479	.514	.449	.539	.460	.851	.462	.667
nervous	.584	.584	.641	.568	.545	.515	.584	.577	.655	.596	.590	.583	.584	.820	.583	.858
depressed	.627	.632	.647	.659	.637	.629	.640	.599	.628	.682	.618	.640	.632	.752	.631	.809
bored	.540	.552	.577	.590	.494	.456	.534	.552	.605	.599	.577	.550	.552	.756	.551	.786
embarrassed	.593	.551	.609	.556	.537	.541	.518	.557	.612	.523	.514	.566	.551	.897	.552	.887
ashamed	.616	.576	.629	.560	.581	.592	.582	.518	.588	.621	.547	.600	.576	.871	.577	.739
hateful	.597	.583	.635	.601	.598	.575	.562	.558	.588	.627	.541	.623	.582	.887	.584	.817
angry	.609	.613	.688	.579	.619	.607	.599	.605	.645	.592	.584	.662	.613	.814	.614	.793
disgusted	.600	.600	.669	.607	.609	.585	.587	.571	.656	.612	.580	.636	.600	.914	.602	.854

	Stage 1		Stage 2										Stage 3		Stage 4	
	M1	M2	AN	LE	NE	GE	EE	LA	SS	ME	SA	CA	WS	BS	WS	BS
<i>Satisfaction with life scale</i>																
1 (close ideal)	.799	-	.840	.807	.850	.813	.819	.789	.747	.772	.661	.842	.799	.882	.798	.892
2 (conditions)	.733	-	.773	.715	.759	.706	.708	.726	.759	.758	.723	.774	.733	.878	.734	.822
3 (satisfied)	.839	-	.887	.861	.890	.882	.826	.808	.794	.833	.751	.878	.839	.941	.839	.959
4 (gotten things)	.692	-	.756	.699	.727	.677	.680	.674	.659	.696	.648	.715	.692	.846	.693	.719
5 (change nothing)	.564	-	.617	.571	.592	.571	.540	.564	.556	.553	.546	.579	.564	.853	.565	.776

Note. Stage 1 models: M1 = initial model; M2 = modified model. Stage 2 cultural clusters: AN = Anglo; LE = Latin Europe; NE = Nordic Europe; GE = Germanic Europe; EE = Eastern Europe; LA = Latin America; SS = Sub-Saharan Africa; ME = Middle East; SA = Southern Asia; CA = Confucian Asia. Stage 3 and 4 levels of analysis: WS = within-samples; BS = between-samples. Values are standardized loadings. All  $p < .001$  except †  $p = .004$ .

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### S5. Links to Materials

*[internal links for peer-review only, public links to files hosted on Open Science framework will be provided when the paper is accepted]*

Study questionnaire (in English): <https://drive.google.com/file/d/1SoEKE-lgS0ZsAmt2j3zvGeB5SLxmqi3N/view?usp=sharing>

Manual for collaborating researchers: <https://drive.google.com/file/d/1ICEPCpcppLp0-u7FAXSRUS8aMj71-VOT/view?usp=sharing>

Exclusion criteria used in data screening:  
[https://drive.google.com/file/d/1Vu97am5N7fKIXEmr3zpbpqXcW99zW0\\_E/view?usp=sharing](https://drive.google.com/file/d/1Vu97am5N7fKIXEmr3zpbpqXcW99zW0_E/view?usp=sharing)



## **S6. Centering Discussion and Results Based on Alternative Approaches**

**Centering of country level predictors.** In all models (in the main text, and in the current supplemental materials), country-level predictors were centered around the mean of the country averages (i.e., the mean calculated from country means). Centering Level 2 predictors around the mean of country averages ensures that each sample contributes equally to the mean that is being used to center the Level 2 predictors (e.g., a country sample with 200 participants has an equal impact on the mean of country averages as a country sample with 600 participants).

**Centering of individual level predictors adopted in models presented in the main text.** In model reported in the main text, we grand-mean centered individual level (i.e., Level 1) predictors, this is, we grand-mean centered both frequency of experience and frequency of expression of emotions. According to Enders and Tofighi (2007), grand-mean centered Level 1 predictors "can be viewed as a composite variable that contains both within- and between-cluster variation" and will be "correlated with variables at both levels of the hierarchy" (p. 125; see also Hofmann & Gavin, 1998). Thus, grand-mean centered Level 1 variables are able to predict not only within-country variation but also between-country variation in life-satisfaction (i.e., the individual-level associations are also aggregated to the country level). Crucially, by controlling for grand-mean centered predictors at Level 1, the information added by the corresponding country mean when entered as a Level 2 variable is information about whether others are expressing their negative emotions (i.e., information about the context of each participant, controlling for aggregated effects of the participants' own characteristics)—reflecting the extrapersonal effects of emotional expression which are the main theoretical focus of our study. This modelling strategy maximally shows the differential effects of own negative emotional expression (associated with significantly

higher life-satisfaction) and others' negative emotional expression (associated with significantly lower life-satisfaction).

However, in order to confirm the robustness of our findings, as well as providing additional insight into the interplay of individual-level and context-level effects, we report below several alternative models, involving country-mean centering of Level 1 predictors and/or additional controls for country-level emotional experience.

**Model with individual-level predictors country-mean centered.** As the most popular approach in cross-cultural psychology is country-mean centering of individual-level predictors, we also tested alternative models where the individual-level predictors were country-mean centered (see Table S4 [models A.2] and Table S5 [Model B.2] for results). Crucially, the Level 1 predictors in these models contain no country-level variance, and so it is unable to account for country-level variation in life-satisfaction. Thus, Level 2 effects of negative emotional expression in these models represent a combination of both aggregated individual-level effects of participants' own emotional experience and expression (where the effect of negative emotional expression was previously shown to be negative) and context-level effects of emotional expression by others in society (where the effect of negative emotional expression was previously shown to be positive). These models also supported our prediction. This finding indicates that the negative country-level effect of others' negative emotional expression significantly outweighs the positive aggregated individual-level effect of participants' own negative emotional expression.

**Hybrid model.** An important caveat on the previous finding is by country-mean centering all Level 1 predictors, we also removed country-level variance in emotional experience from our predictions. Therefore, we tested hybrid model in which we (1) grand-mean centered experience of positive and of negative emotions of individuals

(i.e., Level 1 predictors), (2) country-mean centered expression of positive and of negative emotions of individuals (i.e., Level 1 predictors), and, as in previous models, (3) centered by the mean of country averages for NSEE and Positive Societal Emotional Environment (PSEE; i.e., Level 2 predictors). This approach allowed us to partial out aggregated effects of individual-level emotional experience from our other effects involving emotional expression. Country-mean centering of Level 1 emotional expression variables entailed that the Level 2 effects would again represent a combination of aggregated effects of own emotional expression with truly contextual effects of others' emotional expression. Hybrid models are reported in Tables S6 and S7 (as models A.3 and B.3, respectively). These models provide a maximally conservative test of our prediction and confirm our findings. Thus, even when controlling for aggregated effects of emotional experience, the negative effect of others' negative emotional expression significantly outweighs the positive aggregated effect of participants' own negative emotional expression at the country level.

Table S4. *Summary of Multilevel Models Predicting Life Satisfaction from Emotional Experience and Expression at the Individual Level, and Societal Emotional Environment at the Country Level – Model A.2*

Level & Variable	Null (Step 1)			Random Intercept & Fixed Slope (Step 2)			Random Intercept & Random Slope (Step 3)			Cross-Level Interaction (Step 4)		
	Estimate	SE		Estimate	SE		Estimate	SE		Estimate	SE	
Level 1 - Individual Level												
Intercept	5.494	***	0.085	5.462	***	0.066	5.467	***	0.067	5.461	***	0.066
Positive emotion experiences				0.600	***	0.021	0.594	***	0.021	0.592	***	0.021
Negative emotion experiences				-0.424	***	0.017	-0.427	***	0.018	-0.425	***	0.018
Positive emotion expressions				-0.030		0.020	-0.023		0.024	-0.021		0.024
Negative emotion expressions				0.100	***	0.019	0.085	***	0.023	0.083	***	0.022
Level 2 - Country Level												
Positive societal emotional environment (PSEE)				0.870	***	0.172	0.979	***	0.168	0.959	***	0.168
Negative societal emotional environment (NSEE)				-1.088	***	0.210	-1.044	***	0.206	-1.156	***	0.208
Cross-level interaction												
Positive emotion expressions × PSEE										-0.081	*	0.033
Negative emotion expressions × NSEE										0.131	**	0.044
Variance Components												
Within-country variance	2.388			1.783			1.761			1.761		
Intercept variance	0.337			0.198			0.202			0.199		
Slope variance (Positive emotion expressions)							0.008			0.006		
Slope variance (Negative emotion expressions)							0.008			0.006		
Intercept-slope covariance (Positive emotion expressions)							0.003			0.002		
Intercept-slope covariance (Negative emotion expressions)							-0.013			-0.011		
-2 log likelihood (FIML)	47094			43383	***		43311	***		43297	***	

Note. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . Country-mean centering of individual level variables and country average centering of country level variables.

Table S5. *Summary of Multilevel Models Predicting Life Satisfaction from Emotional Experience and Expression at the Individual Level, and Societal Emotional Environment at the Country Level – Model B.2*

Level & Variable	Null (Step 1)			Random Intercept & Fixed Slope (Step 2)			Random Intercept & Random Slope (Step 3)			Cross-Level Interaction (Step 4)		
	Estimate		SE	Estimate		SE	Estimate		SE	Estimate		SE
Level 1 - Individual Level												
Intercept	5.507	***	0.087	5.463	***	0.063	5.465	***	0.063	5.463	***	0.063
Positive emotion experiences				0.599	***	0.021	0.594	***	0.021	0.592	***	0.021
Negative emotion experiences				-0.426	***	0.018	-0.427	***	0.018	-0.425	***	0.018
Positive emotion expressions				-0.028		0.021	-0.021		0.024	-0.019		0.024
Negative emotion expressions				0.099	***	0.019	0.083	***	0.023	0.082	***	0.022
Parents' education level				0.149	***	0.016	0.142	***	0.016	0.142	***	0.016
Gender				-0.118	***	0.026	-0.115	***	0.026	-0.112	***	0.026
Age				0.000		0.002	0.000		0.002	0.000		0.002
Level 2 - Country Level												
Positive societal emotional environment (PSEE)				1.019	***	0.171	1.076	***	0.169	1.051	***	0.170
Negative societal emotional environment (NSEE)				-0.969	***	0.211	-0.971	***	0.209	-1.023	***	0.209
log transformed GDP per capita				0.164	*	0.069	0.152	*	0.069	0.150	*	0.069
Cross-level interaction												
Positive emotion expressions × PSEE										-0.076	*	0.032
Negative emotion expressions × NSEE										0.135	**	0.044
Variance Components												
Within-country variance	2.377			1.757			1.737			1.737		
Intercept variance	0.346			0.178			0.178			0.178		
Slope variance (Positive emotion expressions)							0.007			0.006		
Slope variance (Negative emotion expressions)							0.008			0.006		
Intercept-slope covariance (Positive emotion expressions)							0.004			0.004		
Intercept-slope covariance (Negative emotion expressions)							-0.006			-0.005		
-2 log likelihood (FIML)	45073			41394	***		41334	***		41320	***	

Note. \*\*\* p < .001, \*\* p < .01, \* p < .05, † p < .10. Country-mean centering of individual level variables and country average centering of country level variables.

Table S6. *Summary of Multilevel Models Predicting Life Satisfaction from Emotional Experience and Expression at the Individual Level, and Societal Emotional Environment at the Country Level – Model A.3*

Level & Variable	Null (Step 1)			Random Intercept & Fixed Slope (Step 2)			Random Intercept & Random Slope (Step 3)			Cross-Level Interaction (Step 4)		
	Estimate	SE		Estimate	SE		Estimate	SE		Estimate	SE	
Level 1 - Individual Level												
Intercept	5.494	***	0.085	5.469	***	0.068	5.473	***	0.068	5.467	***	0.068
Positive emotion experiences				0.601	***	0.021	0.595	***	0.021	0.593	***	0.021
Negative emotion experiences				-0.422	***	0.017	-0.425	***	0.018	-0.423	***	0.018
Positive emotion expressions				-0.031		0.020	-0.023		0.024	-0.022		0.024
Negative emotion expressions				0.099	***	0.019	0.083	***	0.023	0.082	***	0.022
Level 2 - Country Level												
Positive societal emotional environment (PSEE)				0.277		0.177	0.412	*	0.172	0.389	*	0.172
Negative societal emotional environment (NSEE)				-0.672	**	0.216	-0.617	**	0.210	-0.753	***	0.214
Cross-level interaction												
Positive emotion expressions × PSEE										-0.080	*	0.033
Negative emotion expressions × NSEE										0.132	**	0.044
Variance Components												
Within-country variance	2.388			1.783			1.761			1.761		
Intercept variance	0.337			0.208			0.214			0.210		
Slope variance (Positive emotion expressions)							0.008			0.006		
Slope variance (Negative emotion expressions)							0.007			0.006		
Intercept-slope covariance (Positive emotion expressions)							0.004			0.002		
Intercept-slope covariance (Negative emotion expressions)							-0.016			-0.013		
-2 log likelihood (FIML)	47094			43385	***		43313	***		43298	***	

Note. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . Hybrid model - country-mean centering of individual level expression, grand-mean centering of individual level experience, and country average centering of country level variables.

Table S7. *Summary of Multilevel Models Predicting Life Satisfaction from Emotional Experience and Expression at the Individual Level, and Societal Emotional Environment at the Country Level – Model B.3*

Level & Variable	Null (Step 1)			Random Intercept & Fixed Slope (Step 2)			Random Intercept & Random Slope (Step 3)			Cross-Level Interaction (Step 4)		
	Estimate		SE	Estimate		SE	Estimate		SE	Estimate		SE
Level 1 - Individual Level												
Intercept	5.507	***	0.087	5.472	***	0.064	5.475	***	0.064	5.472	***	0.064
Positive emotion experiences				0.601	***	0.021	0.595	***	0.021	0.593	***	0.021
Negative emotion experiences				-0.424	***	0.018	-0.425	***	0.018	-0.423	***	0.018
Positive emotion expressions				-0.029		0.021	-0.022		0.024	-0.020		0.024
Negative emotion expressions				0.097	***	0.019	0.082	***	0.023	0.080	***	0.022
Parents' education level				0.149	***	0.016	0.142	***	0.016	0.142	***	0.016
Gender				-0.118	***	0.026	-0.115	***	0.026	-0.112	***	0.026
Age				0.000		0.002	0.000		0.002	0.000		0.002
Level 2 - Country Level												
Positive societal emotional environment (PSEE)				0.434	*	0.174	0.506	**	0.172	0.481	**	0.172
Negative societal emotional environment (NSEE)				-0.547	*	0.213	-0.547	*	0.211	-0.614	**	0.212
log transformed GDP per capita				0.175	*	0.070	0.158	*	0.069	0.156	*	0.069
Cross-level interaction												
Positive emotion expressions × PSEE										-0.076	*	0.032
Negative emotion expressions × NSEE										0.135	**	0.044
Variance Components												
Within-country variance	2.377			1.757			1.737			1.737		
Intercept variance	0.346			0.181			0.183			0.182		
Slope variance (Positive emotion expressions)							0.007			0.006		
Slope variance (Negative emotion expressions)							0.007			0.006		
Intercept-slope covariance (Positive emotion expressions)							0.005			0.004		
Intercept-slope covariance (Negative emotion expressions)							-0.007			-0.006		
-2 log likelihood (FIML)	45073			41395	***		41335	***		41320	***	

Note. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . Hybrid model - country-mean centering of individual level expression, grand-mean centering of individual level experience, and country average centering of country level variables.

**Models with country-level experienced emotions added.** We construe ‘societal emotional environment’ as the average frequency of *expression* of positive (PSEE) and negative (NSEE) emotions in a given country. However, one may have concerns that country-level *experience* of emotions may need to be controlled for in the model. In other words, what is the effect of living in a societal environment where others experience more or less frequent positive or negative emotions, *even if they do not express these emotions*? For our main analyses, we assume that emotions need to be expressed to create a ‘societal emotional environment’, but in order to test this alternative reasoning we also carried out additional analyses with country-level frequency of emotional experience included in the models.

We first checked the country-level correlations and multicollinearity of the country-level variables of interest (see Table S8).

Table S8. *Correlations Between Variables and their Multicollinearity*

	(1)	(2)	(3)	(4)	(5)
	<i>r</i> ; VIF	<i>r</i> ; VIF	<i>r</i> ; VIF	<i>r</i> ; VIF	VIF
(1) expression of positive emotions		.59; 1.5	.96; <b>13.0</b>	.52; 1.4	<b>25.6</b>
(2) expression of negative emotions	.18; 1.0		.49; 1.3	.92; 6.2	<b>12.0</b>
(3) experience of positive emotions	.87; 4.0	.09; 1.0		.50; 1.3	<b>22.7</b>
(4) experience of negative emotions	.05; 1.0	.79; 2.6	.04; 1.0		<b>9.8</b>
(5) VIF (all four IVs in one model)	4.4	2.9	4.2	2.7	

*Note.* Country-level correlations are reported above the diagonal (upper right side); individual-level correlations (after standardization within countries in order to control for between-country differences) are reported below the diagonal (lower left side). VIFs presented next to *rs* diagnose multicollinearity when two variables are included in the same model. VIFs presented in the fifth row and fifth column are for when all four variables considered in one model. Bolded VIFs denote unacceptable multicollinearity. All correlations are significant with  $ps < .001$ .



The correlation between frequency of expression and frequency of experience of positive emotions at the country level of analysis,  $r(47) = .96, p < .001$ , indicates that these two phenomena are almost perfectly overlapping. Societies of high/low frequency of expression of positive emotions are societies of high/low frequency of experience of positive emotions. The same applies to the expression and experience of negative emotions at the country level of analysis,  $r(47) = .92, p < .001$ .

When considering potential directions of causality, we find it more plausible that expressed emotion induces the experience of emotion of similar valence in observers as the emotional expression is what is directly observable by others. This is consistent with research on emotional contagion: by expressing emotion, one may induce similar affect in observers (Hatfield, Cacioppo, & Rapson, 1993; Kramer, Guillory, & Hancock, 2014).

High levels of multicollinearity (i.e., VIFs from 9.8 to 25.6; see Table S8) between country-level expression and experience of the same valence of emotions (i.e., positive or negative) makes models involving both of these country-level parameters problematic. However, when we conducted analyses that included experience as a Level 2 predictor (see Table S9-S12), our hypothesis was still supported: NSEE remained a significant predictor of lower life satisfaction.

**Limitations of models with country-level experienced emotions added.** Our additional statistical analyses suffered from multicollinearity. Such high correlations indicate that country-level expression and experience of emotions of the same valence are almost perfectly overlapping. Societies of high/low frequency of expression of negative emotions are societies of high/low frequency of experience of negative emotions (the same applies to positive emotions). When considering potential directions of causality, we find it more plausible that expressed emotion induces the

experience of emotion of similar valence in observers as the emotional expression is what is directly observable by others; the opposite causal direction is probably weaker. Our reasoning is consistent with the research on emotional contagion: by expressing emotion, one may induce similar affect in observers (Hatfield, Cacioppo, & Rapson, 1993; Kramer, Guillory, & Hancock, 2014). In sum, although multicollinearity was an issue when we tried to control for emotional experience at the country level, our main finding concerning the ‘double-edged sword’ of negative emotion expression was still found in these additional analyses, providing evidence of its robustness.

Table S9. *Summary of Multilevel Models Predicting Life Satisfaction from Emotional Experience and Expression at the Individual Level, and Societal Emotional Environment and Experience of Emotions Country-averages at the Country Level – Model C.1*

Level & Variable	Null (Step 1)			Random Intercept & Fixed Slope (Step 2)			Random Intercept & Random Slope (Step 3)			Cross-Level Interaction (Step 4)		
	Estimate		SE	Estimate		SE	Estimate		SE	Estimate		SE
Level 1 - Individual Level												
Intercept	5.494	***	0.085	5.468	***	0.057	5.468	***	0.057	5.464	***	0.057
Positive emotion experiences				0.600	***	0.021	0.594	***	0.021	0.592	***	0.021
Negative emotion experiences				-0.424	***	0.017	-0.426	***	0.018	-0.424	***	0.018
Positive emotion expressions				-0.030		0.020	-0.023		0.024	-0.022		0.023
Negative emotion expressions				0.100	***	0.019	0.085	***	0.023	0.084	***	0.022
Level 2 - Country Level												
Positive emotion experiences - Average (EXPE)				-0.639		0.603	-0.636		0.603	-0.661		0.596
Negative emotion experiences - Average (EXNE)				2.127	***	0.529	2.100	***	0.528	2.071	***	0.522
Positive societal emotional environment (PSEE)				0.969		0.612	0.953		0.612	0.992		0.605
Negative societal emotional environment (NSEE)				-2.571	***	0.510	-2.516	***	0.510	-2.520	***	0.504
Cross-level interaction												
Positive emotion expressions × PSEE										-0.084	*	0.032
Negative emotion expressions × NSEE										0.136	**	0.044
Variance Components												
Within-country variance	2.388			1.783			1.761			1.761		
Intercept variance	0.337			0.147			0.146			0.142		
Slope variance (Positive emotion expressions)							0.008			0.006		
Slope variance (Negative emotion expressions)							0.008			0.006		
Intercept-slope covariance (Positive emotion expressions)							-0.001			-0.001		
Intercept-slope covariance (Negative emotion expressions)							-0.002			-0.003		
-2 log likelihood (FIML)	47094			43369	***		43300	***		43284	***	

Note. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . Grand-mean centering of individual level variables and country average centering of country level variables.

Table S10. *Summary of Multilevel Models Predicting Life Satisfaction from Emotional Experience and Expression at the Individual Level, and Societal Emotional Environment and Experience of Emotions Country-averages at the Country Level – Model C.2*

Level & Variable	Null (Step 1)			Random Intercept & Fixed Slope (Step 2)			Random Intercept & Random Slope (Step 3)			Cross-Level Interaction (Step 4)		
	Estimate		SE	Estimate		SE	Estimate		SE	Estimate		SE
Level 1 - Individual Level												
Intercept	5.507	***	0.087	5.479	***	0.054	5.475	***	0.054	5.474	***	0.053
Positive emotion experiences				0.599	***	0.021	0.594	***	0.021	0.592	***	0.021
Negative emotion experiences				-0.426	***	0.018	-0.426	***	0.018	-0.425	***	0.018
Positive emotion expressions				-0.028		0.021	-0.022		0.024	-0.020		0.024
Negative emotion expressions				0.099	***	0.019	0.084	***	0.023	0.082	***	0.022
Parents' education level				0.146	***	0.016	0.139	***	0.016	0.139	***	0.016
Gender				-0.117	***	0.026	-0.113	***	0.026	-0.110	***	0.026
Age				0.000		0.002	0.000		0.002	0.000		0.002
Level 2 - Country Level												
Positive emotion experiences - Average (EXPE)				0.157		0.630	0.092		0.611	0.041		0.606
Negative emotion experiences - Average (EXNE)				1.646	**	0.505	1.843	***	0.490	1.816	***	0.487
Positive societal emotional environment (PSEE)				0.337		0.628	0.339		0.611	0.415		0.606
Negative societal emotional environment (NSEE)				-1.974	***	0.500	-2.129	***	0.487	-2.041	***	0.483
log transformed GDP per capita				0.168	**	0.060	0.200	**	0.058	0.199	**	0.058
Cross-level interaction												
Positive emotion expressions × PSEE										-0.078	*	0.032
Negative emotion expressions × NSEE										0.139	**	0.044
Variance Components												
Within-country variance	2.377			1.757			1.737			1.737		
Intercept variance	0.346			0.127			0.125			0.121		
Slope variance (Positive emotion expressions)							0.007			0.006		
Slope variance (Negative emotion expressions)							0.008			0.006		
Intercept-slope covariance (Positive emotion expressions)							-0.003			-0.001		
Intercept-slope covariance (Negative emotion expressions)							0.009			0.007		
-2 log likelihood (FIML)	45073			41379	***		41318	***		41303	***	

Note. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . Grand-mean centering of individual level variables and country average centering of country level variables.

Table S11. *Summary of Multilevel Models Predicting Life Satisfaction from Emotional Experience and Expression at the Individual Level, and Societal Emotional Environment and Experience of Emotions Country-averages at the Country Level – Model D.1*

Level & Variable	Null (Step 1)			Random Intercept & Fixed Slope (Step 2)			Random Intercept & Random Slope (Step 3)			Cross-Level Interaction (Step 4)		
	Estimate		SE	Estimate		SE	Estimate		SE	Estimate		SE
Level 1 - Individual Level												
Intercept	5.494	***	0.085	5.465	***	0.057	5.466	***	0.057	5.465	***	0.057
Positive emotion experiences				0.600	***	0.021	0.594	***	0.021	0.592	***	0.021
Negative emotion experiences				-0.424	***	0.017	-0.426	***	0.018	-0.425	***	0.018
Positive emotion expressions				-0.030		0.020	-0.023		0.024	-0.022		0.024
Negative emotion expressions				0.100	***	0.019	0.086	***	0.023	0.084	***	0.022
Level 2 - Country Level												
Positive emotion experiences - Average (EXPE)				-0.039		0.603	0.049		0.601	0.063		0.600
Negative emotion experiences - Average (EXNE)				1.703	**	0.529	1.584	**	0.527	1.565	**	0.526
Positive societal emotional environment (PSEE)				0.938		0.612	0.883		0.610	0.871		0.609
Negative societal emotional environment (NSEE)				-2.471	***	0.510	-2.346	***	0.508	-2.372	***	0.508
Cross-level interaction												
Positive emotion expressions × PSEE										-0.082	*	0.033
Negative emotion expressions × NSEE										0.131	**	0.044
Variance Components												
Within-country variance	2.388			1.783			1.761			1.761		
Intercept variance	0.337			0.147			0.147			0.147		
Slope variance (Positive emotion expressions)							0.008			0.006		
Slope variance (Negative emotion expressions)							0.008			0.006		
Intercept-slope covariance (Positive emotion expressions)							0.000			0.000		
Intercept-slope covariance (Negative emotion expressions)							-0.005			-0.005		
-2 log likelihood (FIML)	47094			43369	***		43299	***		43285	***	

Note. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . Country mean centering of individual level variables and country average centering of country level variables.

Table S12. *Summary of Multilevel Models Predicting Life Satisfaction from Emotional Experience and Expression at the Individual Level, and Societal Emotional Environment and Experience of Emotions Country-averages at the Country Level – Model D.2*

Level & Variable	Null (Step 1)			Random Intercept & Fixed Slope (Step 2)			Random Intercept & Random Slope (Step 3)			Cross-Level Interaction (Step 4)		
	Estimate		SE	Estimate		SE	Estimate		SE	Estimate		SE
Level 1 - Individual Level												
Intercept	5.507	***	0.087	5.475	***	0.054	5.475	***	0.054	5.477	***	0.054
Positive emotion experiences				0.599	***	0.021	0.594	***	0.021	0.592	***	0.021
Negative emotion experiences				-0.426	***	0.018	-0.427	***	0.018	-0.425	***	0.018
Positive emotion expressions				-0.028		0.021	-0.021		0.024	-0.019		0.024
Negative emotion expressions				0.099	***	0.019	0.084	***	0.023	0.082	***	0.022
Parents' education level				0.146	***	0.016	0.140	***	0.016	0.139	***	0.016
Gender				-0.117	***	0.026	-0.114	***	0.026	-0.110	***	0.026
Age				0.000		0.002	0.000		0.002	0.000		0.002
Level 2 - Country Level												
Positive emotion experiences - Average (EXPE)				0.756		0.629	0.722		0.625	0.724		0.625
Negative emotion experiences - Average (EXNE)				1.221	*	0.505	1.313	*	0.502	1.297	*	0.502
Positive societal emotional environment (PSEE)				0.309		0.628	0.319		0.624	0.326		0.624
Negative societal emotional environment (NSEE)				-1.875	***	0.499	-1.959	***	0.496	-1.915	***	0.496
log transformed GDP per capita				0.168	**	0.060	0.179	**	0.060	0.178	**	0.060
Cross-level interaction												
Positive emotion expressions × PSEE										-0.076	*	0.032
Negative emotion expressions × NSEE										0.135	**	0.044
Variance Components												
Within-country variance	2.377			1.757			1.737			1.737		
Intercept variance	0.346			0.127			0.127			0.126		
Slope variance (Positive emotion expressions)							0.007			0.006		
Slope variance (Negative emotion expressions)							0.008			0.006		
Intercept-slope covariance (Positive emotion expressions)							-0.001			0.000		
Intercept-slope covariance (Negative emotion expressions)							0.004			0.003		
-2 log likelihood (FIML)	45073			41379	***		41319	***		41305	***	

Note. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . Country mean centering of individual level variables and country average centering of country level variables.

**References to discussion on centering:**

- Enders, C. K., & Tofighi, D. (2007). Centering Predictor Variables in Cross-Sectional Multilevel Models: A New Look at an Old Issue. *Psychological Methods*, 12, 121-138. <https://doi.org/10.1037/1082-989X.12.2.121>
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