**Supplementary material**

**4. Results**

*4.2. Measurement invariance*

*Pleasure orientation to happiness.* Both the factor loading (R² = .980) and the intercept (R² = .997) were good. These R² values suggested a high level of invariance of the pleasure orientation to happiness scale. We also examined whether each combination of items per country had invariant factor loadings and intercepts. We had 72 combinations of item/country (i.e., six items and 12 countries). All 72 combinations had invariant factor loadings (see Table SI). However, there were 17 combinations (23.6%) of item/country that had non-invariant intercepts. The results showed that Item 3 was the least invariant item (i.e., five non-invariant countries) while Item 5 and 6 were the most invariant items (i.e., one non-invariant countries). Moreover, France and Germany were the least invariant countries (i.e., three non-invariant items) while Australia and South Africa were the most invariant countries (i.e., all six items were invariant). Averaging the proportion of non-invariant factor loadings and intercepts, we found that the total invariance of the hedonic happiness scale was 11.8% which is below the 25% threshold (Muthén and Asparouhov, 2014). These results suggest that there is an approximate invariance of the pleasure orientation to happiness scale among the12 countries.

**Table SII.**

Approximate measurement invariance (noninvariance) for the pleasure orientation to happiness scale for countries.

|  |  |
| --- | --- |
| Item | Invariance (noninvariance) for countries |
| Factor loadings |  |
| P1 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| P2 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| P3 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| P4 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| P5 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| P6 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| Intercepts |  |
| P1 | UAE AU BR CN (DE) (FR) IN NG RU SE US ZA |
| P2 | (UAE) AU BR (CN) DE FR (IN) NG RU (SE) US ZA |
| P3 | UAE AU BR (CN) (DE) (FR) IN NG RU (SE) (US) ZA |
| P4 | UAE AU (BR) CN (DE) (FR) IN (NG) RU SE US ZA |
| P5 | UAE AU BR CN DE FR IN NG RU SE (US) ZA |
| P6 | UAE AU BR CN DE FR IN NG (RU) SE US ZA |

*Note*. P = pleasure orientation to happiness; AU = Australia; BR = Brazil; CN = China; DE = Germany; FR = France; IN = India; NG = Nigeria; RU = Russia; SE = Sweden; US = United States; ZA = South Africa.

*Meaning orientation to happiness.* Both the factor loading (R² = .985) and the intercept (R² = .996) were good. These R² values suggested a high level of invariance of the meaning orientation to happiness scale. We also examined whether each combination of items per country had invariant factor loadings and intercepts. We had 48 combinations of item/country (i.e., four items and 12 countries). All 48 combinations had invariant factor loadings (see Table SII). However, there were 17 combinations (35.4%) of item/country that had non-invariant intercepts. The results showed that Item 1 was the least invariant item (i.e., nine non-invariant countries) while Item 4 and 5 were the most invariant items (i.e., two non-invariant countries). Moreover, Russia was the least invariant country (i.e., three non-invariant items) while Australia was the most invariant country (i.e., all four items were invariant). Averaging the proportion of non-invariant factor loadings and intercepts, we found that the total invariance of the eudaimonic happiness scale was 17.7% which is below the 25% threshold (Muthén and Asparouhov, 2014). These results suggest that there is an approximate invariance of the meaning orientation to happiness scale among the12 countries.

**Table SII.**

Approximate measurement invariance (noninvariance) for the meaning orientation to happiness scale for countries.

|  |  |
| --- | --- |
| Item | Invariance (noninvariance) for countries |
| Factor loadings |  |
| M1 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| M3 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| M4 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| M5 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| Intercepts |  |
| M1 | (UAE) AU BR (CN) (DE) (FR) (IN) (NG) (RU) (SE) US (ZA) |
| M3 | UAE AU BR (CN) DE FR IN (NG) (RU) (SE) US ZA |
| M4 | UAE AU (BR) CN (DE) FR IN NG RU SE US ZA |
| M5 | UAE AU BR CN DE FR IN NG (RU) SE (US) ZA |

*Note*. M = meaning orientation to happiness; AU = Australia; BR = Brazil; CN = China; DE = Germany; FR = France; IN = India; NG = Nigeria; RU = Russia; SE = Sweden; US = United States; ZA = South Africa.

*Spiritual orientation to happiness.* Both the factor loading (R² = .990) and the intercept (R² = .996) were good. These R² values suggested a high level of invariance of the spiritual orientation to happiness scale. We also examined whether each combination of items per country had invariant factor loadings and intercepts. We had 48 combinations of item/country (i.e., four items and 12 countries). One combination of item/country (2.1%) had a non-invariant factor loadings (i.e., Item 1 in China; see Table SIII). There were 17 combinations (35.4%) of item/country that had non-invariant intercepts. The results showed that Item 1 was the least invariant item (i.e., six non-invariant countries) while Item 3 and 4 were the most invariant items (i.e., three non-invariant countries). Results indicated that Nigeria was the least invariant countries (i.e., four non-invariant items) while Australia, France, the UAE, and the United States were the most invariant countries (i.e., all four items were invariant). Averaging the proportion of non-invariant factor loadings and intercepts, we found that the total invariance of the spiritual orientation to happiness scale was 18.8% which is below the 25% threshold (Muthén and Asparouhov, 2014). These results suggest that there is approximate invariance of the spiritual orientation to happiness scale among the 12 countries.

**Table SIII.**

Approximate measurement invariance (noninvariance) for the spiritual orientation to happiness for countries.

|  |  |
| --- | --- |
| Item | Invariance (noninvariance) for countries |
| Factor loadings |  |
| S1 | UAE AU BR (CN) DE FR IN NG RU SE US ZA |
| S2 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| S3 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| S4 | UAE AU BR CN DE FR IN NG RU SE US ZA |
| Intercepts |  |
| S1 | UAE AU (BR) (CN) (DE) FR IN (NG) (RU) SE US (ZA) |
| S2 | UAE AU (BR) (CN) (DE) FR (IN) (NG) RU SE US ZA |
| S3 | UAE AU (BR) CN DE FR IN (NG) RU SE US (ZA) |
| S4 | UAE AU BR CN (DE) FR IN (NG) RU SE US (ZA) |

*Note*. S = spiritual orientation to happiness; AU = Australia; BR = Brazil; CN = China; DE = Germany; FR = France; IN = India; NG = Nigeria; RU = Russia; SE = Sweden; US = United States; ZA = South Africa.