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Measuring Time Perspective in Adolescents:

Can You Get the Right Answer by Asking the Wrong Questions?

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Abstract

Time perspective continues to evolve as a psychological construct. The extant literature suggests that higher future orientation and lower present orientation are associated with better developmental outcomes. However, the extant literature also suggests that issues remain with the measurement of the construct. Recently, a 25-item version of the Zimbardo Time Perspective Inventory (ZTPI-25) was suggested for use based on high internal consistency estimates and good discriminant validity of scores in a sample of Italian adolescents. However, the genesis of this scale is uncertain. The present study examined the factorial validity, reliability, and concurrent validity of ZTPI-25 scores in Slovenian, American, and British adolescents. Results revealed satisfactory concurrent validity based on correlations with measures used in the development of the full ZTPI. However, internal consistency and factorial validity of scores were unsatisfactory. The present study questions the use of the ZTPI-25 with adolescents in the context of conceptual and measurement issues more broadly.

1. Introduction

Time perspective is an individual difference variable which describes the influence that considerations of past, present and future have on a range of human behaviors. Although its study has a relatively long research history, the introduction of the Zimbardo Time Perspective Inventory (ZPTI, Zimbardo & Boyd, 1999) signalled renewed interest in the construct. The ZTPI is comprised of five factors: (a) Past Negative (PN) reflects pessimism toward the past, (b) Past Positive (PP) reflects sentimental and happy feelings about the past, (c) Present Hedonistic (PH) reflects a desire for pleasure with and enjoyment of present experiences, (d) Present Fatalistic (PF) is characterized by the belief that uncontrollable forces determine fate, and Future (F) assesses thinking about and planning for the achievement of long-term goals. Despite a growing body of literature on time perspective, some of the instruments used to measure it, including the ZTPI, have both conceptual and psychometric problems (e.g., Shipp, Edwards, & Schurer-Lambert, 2009).

An example of these problems is found in a 25-item Italian, short version of the ZTPI (ZTPI-25; Laghi, Baiocco, Liga, Guarino, & Baumgartner, 2013). Referencing two other papers (i.e., Laghi, Baiocco, D'Alessio, & Gurrieri, 2009; Laghi, D'Alessio, Pallini, & Baiocco, 2009), Laghi and colleagues (2013) reported that scores on the 25-item version had good psychometric properties in adolescent samples. Both of the 2009 papers by Laghi and colleagues cited a third paper (D'Alessio, Guarino, De Pascalis, & Zimbardo, 2003) in support of the ZTPI-25. However, this third paper indicates that the scale used by D'Alessio et al. (2003) consists of only 22 items assessing the PF, PH and F constructs (not PN and PP), six of which are not ZTPI items. Indeed, there are only five ZTPI items in common between the D'Alessio et al. (2003) version of the ZPTI and the ZTPI-25. Additionally, Laghi et al. (2013) reported high Cronbach's

alpha values for ZPTI-25 scores (PN = 0.83; PP = 0.82; PH = 0.84; PF = 0.85; F = 0.81), and referenced similar internal consistency estimates in the two 2009 manuscripts (Laghi, Baiocco et al., 2009; Laghi, D'Alessio et al., 2009). However, both 2009 papers simply restate the reliability estimates reported by D'Alessio et al. (2003) scores on the 22-item scale.

Although the origin of the ZTPI-25 remains unclear, the reliability estimates offer promise (Laghi et al., 2013), as do other results suggesting that, in line with results elsewhere (e.g., Zimbardo & Boyd, 1999; Zimbardo, Keough, & Boyd, 1997), higher scores on F and PP are associated with better functioning, with the reverse true for the other three subscales (PN, PF & PH; Laghi et al., 2013). Given the potential utility of this 25-item version, we used existing data from three countries to test the factorial structure, concurrent validity, and internal consistency of ZTPI-25 scores.

In the scale development study introducing the ZTPI, Zimbardo and Boyd (1999) established concurrent validity through significant and meaningful (i.e., $r > |.30|$) correlations between ZPTI scores and a variety of constructs in theoretically consistent directions. PN scores were negatively associated with self-esteem and positively associated with aggression; PH scores were positively associated with novelty seeking and sensation seeking; F scores were positively associated with conscientiousness and consideration of future consequences and negatively associated with sensation seeking; and PF scores were positively associated with aggression and negatively associated with consideration of future consequences. PP scores were positively associated with self-esteem and negatively associated aggression. In the present study, we examined concurrent validity using measures of aggression, self-esteem, self-efficacy, general conformity, attachment to parents, and consideration of future consequences.

2. Method

2.1 Participants

Participants in the United Kingdom sample were 913 school children (aged 12-16; 49.8% male) from Northern Ireland. A total of 943 questionnaires were completed with 913 included in analyses. Thirty were excluded as a result of having been partially completed or spoiled (all answer options endorsed).

Participants in the United States study were 815 academically talented adolescents aged 11 to 18 (46.6% male) attending a summer program at a research university in a Western state. Students were accepted into the summer program using several criteria, including school achievement, teacher recommendations, and an academic product. Participants were predominantly in the 7^{th} to 11^{th} grades.

Participants in Slovenian sample were a general population sample of 154 adolescents aged 15 to19 (M = 16.97; 70.1% female) who completed an online questionnaire sent to them via email or social media (e.g., Facebook). Participants from all three studies were used to examine structural validity and internal consistency, and participants from the UK and Slovenia were used for concurrent validity analyses. Greater details about the samples can be obtained from other papers using these samples (not included blind review).

2.2 Measures

The ZTPI-25 (Laghi et al., 2013) is a shortened version of the ZTPI. It consists of the five subscales, PN, PP, PH, PF and F (each consisting of 5 items). Participants respond to questions using a 5-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*). Internal consistency estimates for subscale scores based on Cronbach's α were all high as reported above. The scale was adapted to the Slovenian language using the back-translation technique (Geisinger, 2003).

The Consideration of Future Consequences Scale (CFCS; Strathman, Gleicher, Boninger, & Edwards, 1994) is a 12-item scale made up of five positively worded items and seven negatively worded items. As in other studies (e.g., Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008), in this study, the positively worded items were summed to yield a CFC-F (future) score, indicating active consideration of future consequences. The negatively worded items were not reverse-scored and were summed to yield a CFC-I (immediate) score, so that CFC-I scores reflect active consideration of immediate consequences, or a present orientation. Strathman et al. reported internal consistency estimates for CFSC scores in college student samples ranging from 0.80 to 0.86, a 2-week test–retest reliability coefficient of .76, and a 5-week test-retest reliability coefficient of .72 (α current study = .78 for CFC-F and .81 for CFC-I). This scale was used with the Slovenian sample and the same procedure as described above was used for the translation of the scale.

The following five instruments were used with the British sample. The Self-Efficacy Questionnaire for Children (SEQ-C; Muris, 2001) contains 21 items assessing three domains of self-efficacy: (a) academic self-efficacy (α current study = .88), (b) emotional self-efficacy (α current study = .79), and (c) social self-efficacy (α current study = .71). Each subscale consists of seven items, and respondents rate their competence in each self-efficacy domain on a 5-point Likert scale (1 = *not at all*; 5 = *very well*). SEQ-C subscale scores have been found to be structurally valid and internally consistent (α > .80; Muris, 2001).

The Aggression Questionnaire (AQ; Buss & Perry, 1992) consists of 29 items, which assess four constructs: (a) verbal aggression (5 items; α = .72; α current study = .68) (b) physical aggression (9 items; α = .85; α current study = .89) (c) anger (7 items; α = .83; α current study = .85), and (d) hostility (8 items; α = .77; α current study = .85). Correlations between the AQ

subscales and other personality traits have yielded the strongest relationships with impulsiveness, assertiveness, and competitiveness, with anger correlating most closely with impulsiveness (Buss & Perry, 1992). Test-retest coefficients were also found to be acceptable ($.72 \leq r \leq .80$; Buss & Perry, 1992). Scores on the subscales were combined to create a composite aggression score.

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1989) is a self-report measure of global self-esteem consisting of 10 statements (5 reversed-scored) related to overall feelings of self-worth or self-acceptance. Scores on the RSES have yielded strong reliability and validity coefficients across a large number of different sample groups with α coefficients ranging from 0.72 to 0.83 (Gray-Little, Williams, & Hancock, 1997; α current study = .82).

The Parents subscale of the Inventory of Parent and Peer Attachment-Revised (IPPA-R; Gullone & Robinson, 2005) was developed to assess adolescents' perceptions of the positive and negative affective/cognitive dimension of relationships with their parents, particularly how well these figures serve as sources of psychological security. The parental subscale consists of 28 items that make up three subscales: parental trust (10 items, α = .77), parental communication (10 items, α = .77), and parental alienation (8 items, α = .77). An overall attachment score is obtained by summing the Trust and Communication scores, and subtracting the Alienation score (α current study = .78).

The Conformity subscale of the Peer Pressure, Popularity, and Conformity Scale (Santor, Messervey, & Kusumakar, 2000) is a combination of three subscales with 7 items assessing general conformity (e.g., "Even when I disagree with my parents' wishes, I usually do what I am told"). Estimates of internal consistency have been reported as adequate with α coefficients ranging from 0.69 to 0.91 (α current study = .77).

Given limitations due to the time allotted by participating schools in the British sample, it was not feasible to gather data using all scales in all schools. All participants completed the ZTPI, whereas other scales were completed by sub-samples of the cohort: self-esteem (n = 735; 81%), self-efficacy (n = 602; 66%), Conformity (n = 269; 29%), aggression (n = 333; 36%), and parental attachment (n = 133; 15%).

2.3 Statistical Analyses

Model fit was assessed using confirmatory factor analyses (CFA) and exploratory structural equation modeling (ESEM) in Mplus 7 (Muthén & Muthén, 2012) and the robust weighted least squares (WLSMV) estimator. ESEM (see Asparouhov & Muthén, 2009) is a strategy predicated on the integration of confirmatory and exploratory factor analysis (Weisner & Schandling, 2013). ESEM differs from standard CFA in that all factor loadings and cross loadings are estimated, while observing various constraints necessary for model identification, and factor loading matrices can be rotated. Like CFA however, ESEM assesses the fit of an *a priori* model. Marsh et al. (2009) argued that ESEM is a viable alternative to standard CFA for psychological scales composed of indicators with many nonzero cross-loadings.

WLSMV estimates a mean-adjusted chi-square (χ^2) test statistic that is robust to non-normality and is appropriate when using categorical or ordinal data. A five-factor model for the ZTPI was assessed. An oblique geomin rotation, as recommended by Marsh et al. (2009) with an epsilon value of 0.5 and WLSMV estimation was used in all ESEM analyses as recommended when there are more than four response categories (Beauducel & Herzberg, 2006) and data may not be normally distributed (Bentler & Wu, 2002).

The indices used to test model fit were χ^2, the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the weighted

root mean square residual (WRMR). Although Hu and Bentler (1999) recommended stringent cut-offs (i.e., > .95 for CFI and TLI, < .06 for RMSEA) and Yu (2002) identified a cut-off lower than 1.0 for WRMR, Perry and colleagues (2013) suggested that strict adherence to these cut-off values often lead to erroneous results, as factor loadings in social sciences are typically lower (see, e.g., Heene, Hilbert, Draxler, Ziegler, & Bühner, 2011). We also examined standardized parameter estimates. Factor loadings for CFA were interpreted using Comrey and Lee's (1992) recommendations (i.e., > .71 = excellent, > .63 = very good, > .55 = good, > .45 = fair and > .32 = poor). Additionally, Pearson's correlations were computed between time perspective measures and other psychosocial measures in the British sample. These latter analyses were performed in SPSS v.20.

3. Results

Results from the structural analyses are reported in Tables 1 and 2 and show that the CFA fit indices across the three samples fell short of the acceptable range for CFI, TLI, RMSEA and WRMR indices. All of the ESEM fit indices for the data in the UK sample and the CFI value for the US sample fell within the *good* fit range. However, the TLI value for the ESEM analyses in the smaller Slovenian sample still fell short of the .95, 'good' cut-off, but the CFI met the .90 *adequate* cut-off.

Insert Tables 2 & 3

Table 2 displays the CFA and ESEM item loadings for all three samples. Using Comrey and Lee's (1992) recommendation, fewer than half of the 25 items had *fair* (≥.45) loadings across all samples and both methods (CFA and ESEM). Moreover, there was variability in

coefficient salience across the three samples and the two methods. There were two substantive cross-loadings (> .20) in the British sample. In the American sample, there were two substantive cross-loadings on the PH subscale, one of which (PH28) had a greater loading onto the PF scale than its intended factor. Two items from both the PP and the PN factors substantively cross-loaded onto other factors, though both lower than their intended factor. One item from the PF factor and one item from the F factor cross-loaded onto other factors, though both lower than their intended factor.

All factors demonstrated some cross-loadings in the Slovenian sample. Four items from the PH factor cross-loaded, one of which (PH28) loaded equally onto the PF factor as its intended scale. Three PP items cross-loaded, one of which, (PP20) loaded greater onto the F factor than the PP factor. One item (PN22) from the PN factor cross-loaded onto two other factors, two items from the F factor cross-loaded, and three items from the PF scale cross-loaded, two of which (PF3 and PF37) loaded greater onto the PH factor than their intended factor.

Table 3 displays the latent factor correlations and internal consistency estimates for all samples. Internal consistency estimates were low to modest, ranging from .48 to .80, with PH and PF estimates suboptimal in all three samples, and F suboptimal in all but the Slovenian sample.

Table 4 displays the results of Pearson's correlations between ZTPI-25 scores and scores on psychosocial and temporal measures in the British sample. A threshold of |.30| was used for interpretation, and the pattern of findings was in keeping with theory. Results show that F scores had a negative correlation with aggression, and positive correlations with conformity, academic self-efficacy and parental attachment. PN scores had a negative relationship with emotional self-efficacy, and PF scores had a positive relationship with aggression and a negative relationship

with conformity, academic self-efficacy and parental attachment. PP scores had a positive relationship with parental attachment. However, PH scores had no correlations above .30 with any of the validity constructs.

In the Slovenian sample, PH and PF scores had positive correlations with CFC-I scores (r = .41 and .35 respectively) and F scores had a negative correlation with CFC-I scores (r = -.35). Moreover, F scores had a positive association with CFC-F scores (r = .45).

Insert Table 4

4. Discussion

The aims of the present study were to examine the factorial structure, concurrent validity, and reliability of a short-form of the ZTPI, the ZTPI-25, the precise origin of which remains unclear. Although scale items are reported in Laghi et al. (2013), the scale differs substantially from the one upon which it is purported to be based (i.e., D'Alessio et al., 2003) in terms of number of items, item wording, and factorial structure.

With regard to concurrent validity, results provide some support for ZTPI-25 scores, insofar as significant correlations with measures previously established to be related to ZTPI factors were in the hypothesized direction. Although there were no significant medium-sized correlations between PH and any of the psychosocial measures, and only one between PP and another variable, the other three ZTPI-25 factors correlated > .3 with at least two of these psychosocial measures. Additionally, in the Slovenian sample, correlations between three ZTPI-25 factors and either the CFC-F and CFC-I factors of the Consideration of Future Consequences Scale were both conceptually meaningful and medium-sized. These findings mirror findings in

the literature. For example, correlation coefficients in the .40 to .50 range have been reported between unidimensional CFC scale scores and scores on the ZTPI F factor in College student and general population samples (e.g., Daugherty & Brase, 2010; Zimbardo & Boyd, 1999).

The reliability estimates in the present study were considerably lower than those reported by Laghi and colleagues (2013). Although it could be argued that the differences are due to differences in language (Italian vs. Slovenian and English), the totality of results suggest that this alone does not account for the lower reliability estimates. Reliability estimates for PN were good in all samples, while those for PP and F factors in all samples were in the modest to acceptable range. However, unsatisfactory estimates were observed for both the PH and PF factors, with estimates for the smaller Slovenian sample yielding the highest internal consistency estimate for PH scores.

Results of the factorial validity in the present study were also mixed. Firstly, in the CFA models, results for the RMSEA and SRMR indices of misfit were all acceptable to satisfactory with the exception of the SRMR value in the Slovenian sample, which was relatively small in size. Although these indices were acceptable, the major fit indices (i.e., CFI and TLI) fell short of the threshold for acceptable fit in all three samples. In the full 56-item ZTPI, it is probable that there would be many items that would substantively cross-load. However, this ought not to be the case in a shortened version with more deliberately chosen items. One of the concerns about the ZTPI-25 is that it is not clear how or why the 25 items were selected. The fact that the fit indices improved so dramatically by permitting items to load on multiple factors in the ESEMs is problematic and suggests that the factorial validity is weak. The ESEM fit indices in the UK and US samples were good, with the indices in the smaller Slovenian sample only adequate. With specific regard to the items that did not load satisfactorily in all samples in both

CFA and ESEM, there is no obvious reason why this was so. However, a number of them (e.g., Future #45 "*I am able to resist temptations when I know that there is work to be done*", or Future #13 "*Meeting tomorrow's deadlines and doing other necessary work come before tonight's play*") appear to measure constructs other than time perspective, with the two examples above arguably measuring conscientiousness.

The enhanced fit indices obtained in the ESEM models come at a potential cost, namely, factors with smaller numbers of items will be much less powerful in identifying individual differences. This reduction in the overall amount of variance accounted for in samples has implications for the ability of the ZTPI-25 to discriminate between those scoring high and low on the various factors.

4.1 Conclusion

Laghi and colleagues (2013) argued that ZTPI-25 scores were valid and based on previous studies. Concurrent validity coefficients in the present study suggest that scores on some subscales had reasonably good concurrent validity evidence and provide support for the on-going use of this measure with adolescents. However, the reliability coefficients suggest problems with this measure, a concern that is heightened by the factorial validity analyses. The development of the ZTPI-25 indicates that there is interest in an instrument that is shorter than the 56 items on the original ZPTI. However, the limitations of both short forms suggest that the development of a shortened ZPTI needs to be carefully undertaken with the goal of obtaining scores that are psychometrically sound in adolescent and adult samples and different cultural contexts.

References

Asparouhov, T., & Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling, 16*, 397-438. doi:10.1080/10705510903008204

Beauducel, A., & Herzberg, P. Y. (2006). On the performance of maximum likelihood versus means and variance adjusted weighted least squares estimation in CFA. *Structural Equation Modeling, 13*, 186–203. doi:10.1207/s15328007sem1302_2

Bentler, P. M., & Wu, E. J. C. (2002). EQS 6 for Windows user's guide. Multivariate Software.

Buss, A. H., & Perry, M. (1992). The Aggression Questionnaire. *Journal of Personality and Social Psychology*, *63*, 452–459. doi:10.1037/0022-3514.63.3.452

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis.* Hillsdale, NJ: Lawrence Erlbaum.

D'Alessio, M., Guarino, A., De Pascalis, V., & Zimbardo, P. G. (2003). Testing Zimbardo's Stanford Time Perspective Inventory (STPI)—Short Form. An Italian study. *Time and Society*, 2/3, 333–347.

Daugherty, J. R., & Brase, G. L. (2010). Taking time to be healthy: Predicting health behaviors with delay discounting and time perspective. *Personality and Individual Differences, 48*, 202-207.

Geisinger, K. F. (2003). Testing and assesment in cross-cultural psychology. V J. R. Graham, J. A. Naglieri, & I. B. Weiner (Eds.), *Handbook of psychology, assessment psychology* (Vol. 10; pp. 95–119). Hoboken, NJ: Wiley.

Gray-Little, B., Williams, V. S. L., & Hancock, T. D. (1997). An item response theory analysis of the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin, 23*, 443–451. doi:10.1177/0146167297235001

Gullone, E., & Robinson, K. (2005). The Inventory of Parent and Peer Attachment – Revised (IPPA-R) for children: A psychometric investigation. *Clinical Psychology and Psychotherapy*, *1*, 67–79. doi:10.1002/cpp.433

Heene, M., Hilbert, S., Draxler, C., Ziegler, M., & Bühner, M. (2011). Masking misfit in confirmatory factor analysis by increasing unique variances: A cautionary note on the usefulness of cutoff values of fit indices. *Psychological Methods, 16,* 319–336. doi:10.1037/a0024917

Hu, L., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling*, *6*, 1−55. doi:10.1080/10705519909540118

Joireman, J., Balliet, D., Sprott, D., Spangenberg, E., & Schultz, J. (2008). Consideration of future consequences, ego-depletion, and self-control: Support for distinguishing between CFC-immediate and CFC-future sub-scales. *Personality and Individual Differences*, *45*, 15–21. doi:10.1016/j.paid.2008.02.011

Laghi, F., Baiocco, R., D'Alessio, M., & Gurrieri, G. (2009). Suicidal ideation and time perspective in high school students. *European Psychiatry*, *24*, 41–46.

Laghi, F., Baiocco, R., Liga, F., Guarino, A., & Baumgartner, E. (2013). Identity status differences among Italian adolescents: Associations with time perspective. *Child and Youth Services Review*, *35*, 482-487.

Laghi, F., D'Alessio, M., Pallini, S., & Baiocco, R. (2009). Attachment representations and time perspective in adolescence. *Social Indicators Research, 90,* 181–194.

Marsh, H. W., Muthén, B., Asparouhov, A., Lüdtke, O., Robitzsch, A., Morin, A. J. S., & Trautwein, U. (2009). Exploratory structural equation modeling, integrating CFA and EFA: Application to students' evaluations of university teaching. *Structural Equation Modeling, 16,* 439–76. doi:10.1080/10705510903008220

Muris, P. (2001). A brief questionnaire for measuring self-efficacy in youths. *Journal of Psychopathology and Behavioral Assessment, 23,* 145–149. doi:10.1023/A:1010961119608

Muthén, B. O., & Muthén, L. K. (2010). Mplus version 4 [Computer Programme]. Los Angeles, CA: Muthén & Muthén.

Rosenberg, M. (1989). *Society and the adolescent self-image* (Rev. ed.). Middletown, CT: Wesleyan University Press.

Santor, D. A., Messervey, D., & Kusumakar, V. (2000). Measuring peer pressure, popularity and conformity in adolescent boys and girls: Predicting school performance, sexual attitudes and substance abuse. *Journal of Youth and Adolescence, 29,* 163–182. doi:10.1023/A:1005152515264

Shipp, A. J., Edwards, J. R., & Schurer-Lambert, L. (2009). Conceptualization and measurement of temporal focus: The subjective experience of the past, present, and future. *Organizational Behavior and Human Decision Processes, 110,* 1−22. doi:10.1016/j.obhdp.2009.05.001

Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology, 66,* 742–752. doi:10.1037/0022-3514.66.4.742

Weisner, M., & Schandling, G. T. (2013). Exploratory structural equation modeling, bifactor models, and standard confirmatory factor analysis models: Application to the BASC-2 Behavioral and Emotional Screening System Teacher Form. *Journal of School Psychology*, *51,* 751–763. doi:10.1016/j.jsp.2013.09.001

Yu, C. Y. (2002). *Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes.* Unpublished doctoral dissertation, University of California, Los Angeles.

Zimbardo, P. G., & Boyd, J. N. (1999). Time perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology, 77,* 1271–1288. doi:10.1037/0022-3514.77.6.1271

Zimbardo, P. G., Keough, K. A., & Boyd, J. N. (1997). Present time perspective as a predictor of risky driving. *Personality and Individual Differences, 23,* 1007-1023. doi:10.1016/S0191-8869(97)00113-X

Table 1

CFA and ESEM Results for the ZTPI-25

	χ^2	*df*	CFI	TLI	RMSEA (90% CI)	WRMR
CFA						
UK	1196.34	265	.86	.84	.06 (.06-.07)	1.77
US	1653.17	265	.74	.70	.08 (.08-.08)	2.16
Slovenia	559.22	265	.76	.73	.09 (.08-.10)	1.28
ESEM						
UK	331.73	185	.98	.96	.03 (.02-.03)	.65
US	362.98	185	.97	.95	.03 (.03-.04)	.73
Slovenia	266.05	185	.94	.89	.05 (.04-.07)	.56

Note. CFA = confirmatory factor analysis; ESEM = exploratory structural equation modelling; χ^2 = chi-square; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval; WRMR = weighted root mean square residual; UK n = 913; US n = 815; Slovenia n = 154.

*$p < .001$.

Table 2

Standardized Estimates from CFA and ESEM

	British sample (n = 913)				American sample (n = 815)				Slovenian sample (n = 154)			
	CFA	R^2	ESEM	*Hi Xl*	CFA	R^2	ESEM	*Hi Xl*	CFA	R^2	ESEM	*Hi Xl*
Past Positive Factor												
2	**.76**	.58	**.76**	.11	**.54**	.29	**.58**	.11	.35	.12	**.57**	.12
7	**.68**	.46	**.70**	.02	**.68**	.48	**.78**	.02	**.69**	.48	**.60**	.03
11	**.66**	.44	**.54**	.11	**.70**	.31	**.45**	.11	**.88**	.78	**.48**	.27
20	**.73**	.53	**.59**	.26	**.63**	.37	**.48**	.26	**.77**	.60	.23	.44
29	**.58**	.33	**.57**	.28	.05	.02	.32	.28	.21	.05	**.71**	.24
Past Negative Factor												
16	**.71**	.50	**.75**	.03	**.77**	.57	**.78**	.03	**.72**	.52	**.64**	.17
22	.42	.18	.40	.10	**.50**	.24	**.55**	.10	**.51**	.26	**.50**	.31
25	**.78**	.60	**.52**	.27	**.73**	.39	**.55**	.27	**.86**	.75	**.83**	.12
27	.38	.14	**.46**	.30	**.46**	.18	**.47**	.30	**.57**	.32	**.57**	.13
50	**.68**	.46	**.74**	.11	**.78**	.56	**.76**	.11	**.80**	.64	**.79**	.14
Present Hedonistic Factor												
17	.32	.10	.42	.27	**.53**	.21	.44	.27	.37	.13	**.56**	.28
26	**.51**	.26	**.59**	-.02	**.54**	.25	**.76**	-.02	**.50**	.25	**.68**	.02
28	**.57**	.32	.41	.17	.27	.06	.17	.36	**.53**	.28	.32	.32
46	**.60**	.37	**.50**	.18	**.49**	.20	.38	.18	**.80**	.64	**.60**	.23
48	**.57**	.32	**.52**	.11	.40	.14	.37	.11	**.61**	.37	**.58**	.12
Present Fatalistic Factor												
3	.40	.16	**.46**	.17	.44	.19	**.48**	.17	.24	.06	.07	.23
14	**.64**	.42	**.60**	.06	**.70**	.38	**.64**	.06	**.50**	.25	.33	.24
37	.40	.16	.31	.20	**.49**	.18	.37	.20	**.53**	.28	.26	.30
39	**.55**	.30	**.64**	.04	**.61**	.32	**.65**	.04	**.58**	.34	**.65**	.07
53	**.59**	.35	**.45**	.07	**.50**	.23	.48	.05	**.51**	.26	**.80**	.07
Future Factor												
10	.44	.19	.43	.12	**.59**	.29	**.50**	.12	**.52**	.27	.45	.14
13	**.69**	.48	**.62**	.06	**.51**	.22	**.59**	.06	**.56**	.32	**.63**	.05
21	**.65**	.42	**.63**	.15	**.60**	.29	.39	.15	**.88**	.77	**.75**	.21
30	**.49**	.24	.35	.21	.34	.12	.27	.21	**.63**	.40	**.70**	.25
45	**.56**	.32	**.60**	.06	**.51**	.24	**.56**	.06	**.58**	.33	**.54**	.14

Note. All R^2 values > .10 are statistically significant at $p < .05$. Loadings > .45 are bolded. Hi Xl = Value of highest cross loading item in sample.

Table 3
Internal Consistency Estimates and Latent Factor Correlations from CFAs and ESEMs

	PH	PP	PN	PF	F	α
British Sample (n = 913)						
Present Hedonistic	-	.18*	.01	.22*	-.12*	.56
Past Positive	.23*	-	-.20*	-.05	.21*	.78
Past Negative	.11	-.44*	-	.18*	-.00	.70
Present Fatalistic	.50*	-.07	.33*	-	-.21*	.60
Future	-.40*	.35*	-.03	-.42*	-	.66
American Sample (n = 815)						
Present Hedonistic	-	.24*	.06	.07	.11*	.48
Past Positive	.49*	-	-.12**	-.01	.22*	.62
Past Negative	.11	-.34*	-	.23*	-.05	.75
Present Fatalistic	.33*	-.10	.46*	-	-.18*	.62
Future	.22*	.52*	-.11	-.29*	-	.59
Slovenian Sample (n = 154)						
Present Hedonistic	-	.19*	.05	.22*	.06	.67
Past Positive	.22	-	-.16*	-.01	.22*	.71
Past Negative	.29*	-.63*	-	.16	-.13	.80
Present Fatalistic	.71*	.04	.34*	-	-.07	.55
Future	.02	.63*	-.13	-.04	-	.73

Note. CFA latent factor correlations are presented below the diagonal and ESEM latent factor correlations are presented above the diagonal.
*$p < .01$.

Table 4

Pearson's Correlations between ZTPI-25 factors and Psychosocial Measures in British Sample

	Aggression	Conformity	Self-Esteem	Academic Self-Efficacy	Social Self-Efficacy	Emotional Self-Efficacy	Attachment
Past Positive	-.26	.23	.17	.22	.22	.16	*.32*
Past Negative	.27	-.07	*-.32*	-.12	-.13	*-.31*	-.21
Present Hedonistic	.19	-.24	-.03	-.17	.21	.05	-.13
Present Fatalistic	*.44*	*-.34*	-.25	*-.30*	-.05	-.09	*-.35*
Future	*-.35*	*.49*	.14	*.56*	.01	.05	*.44*

Note. $n = 913$. Correlations > |.12| are significant at $p < .01$, and correlations $\geq .30$ (medium effect size) are italicized.