

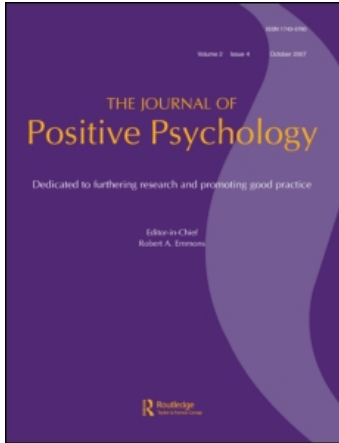
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A question of balance: Time perspective and well-being in British and Russian samples

Ilona Boniwell^a, Evgeny Osin^{b*}, P. Alex Linley^c and Galina V. Ivanchenko^d

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Two studies were conducted investigating the relationship between the Zimbardo Time Perspective Inventory (ZTPI) scales and well-being measures in British ($N = 179$) and Russian ($N = 289$) student samples. On the basis of person-oriented approach, a cluster-analysis operationalization of Balanced Time Perspective (BTP) using ZTPI was proposed and validated, demonstrating more evidence for its validity than the previously suggested cut-off-point approach. Four distinct time perspective patterns were discovered in both samples: future-oriented, present-oriented, balanced and negative. The clusters revealed significant differences in well-being, with members of the BTP cluster demonstrating the highest scores in both samples. The relationship between ZTPI and Temporal Life Satisfaction Scale in the British sample was found to be non-uniform for past, present and future. Based on these findings, a distinction between three aspects of time perspective is theoretically proposed, and its implications for the future development of the ZTPI are discussed.

Keywords: time perspective; balanced time perspective; well-being; Zimbardo Time Perspective Inventory; person-oriented approach

The notion of time perspective

Time processes have been studied in a multitude of ways by philosophers, scientists, sociologists, anthropologists and psychologists. One of the central philosophical debates of whether time is subjectively or objectively based, credited to St. Augustine and Newton, has informed two distinct approaches to conceptualizing and studying time, subsequently utilized by social scientists. Within the first approach, time is seen as an objective or physical phenomenon, as something measurable, continuous, homogeneous and universal. This view of time, otherwise termed *geographical* or *clock* time, is reflected in the studies of time use or time budgets (Harvey & Pentland, 1999; Robinson, 1999). The second approach views time as an internal, subjective phenomenon, often called ‘psychological time,’ ‘lived time’ or ‘time as it is processed by the human mind’ (Gorman & Wessman, 1977). Within the subjective paradigm, research has focused on time estimation, subjective duration of experience or time perception, time personality, time congruity, time urgency, time intensity, polychronicity and monochronicity, time structure and perceived time use (Boniwell, 2005; Francis-Smythe, 1996; Kaufman, Lane, & Lindquist, 1991; McGrath, 1988; Waller, Conter, Gibso, & Carpenter, 2001). Time perspective is another key area of research within this paradigm.

Time perspective (TP) represents an individual’s cognitive way of relating to the psychological concepts of past, present and future, which affects decision making and subsequent actions (Boniwell, 2005). One of the earlier definitions of TP was suggested by Lewin (1951, p. 75) as ‘the totality of the individual’s views of his psychological future and psychological past existing at a given time.’ Later definitions highlight cognitive, affective and volitional aspects of the construct, defining TP as ‘a cognitive operation that implies both an emotional reaction to imagined time zones (such as future, present or past) and a preference for locating action in some temporal zone...’ (Lennings, 1996, p. 72).

The formation of TP is believed to be heavily influenced by the processes of socializing, modelling, education, cultural and other environmental factors (Seginer, 2003). Nevertheless, it also appears to be affected by situational factors, such as going on vacation, inflation or stress (Beiser, 1987; Zimbardo & Boyd, 1999). Yet, despite being shaped by upbringing and environmental forces, when a particular temporal bias comes to dominate one’s outlook and behaviour, TP is claimed to become a relatively stable personality characteristic (Zimbardo & Boyd, 1999).

TP is a powerful influence on many aspects of behaviour, attitudes and values, such as educational

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achievement, health, sleep and dreaming patterns, choice of food, romantic partner choices, sexual behaviour, risk-taking and perceived time pressure amongst other factors (Keough, Zimbardo, & Boyd, 1999; Zimbardo & Boyd, 1999; Zimbardo, Keough, & Boyd, 1997). In comparison to the other time orientations, most research has been carried out on the future time perspective. Studies have highlighted the positive aspects of future TP, such as motivation, sense of responsibility, ability to organize and plan actions, self-efficacy (Lennings & Gow, 1997; Seijts, 1998) and superior academic achievement (Mello & Worrell, 2006). Present time orientation, however, has been found to be associated with health problems, crime, addictions, dangerous driving and sexual promiscuity (Keough et al., 1999; Rothspan & Read, 1996). Proportionally less work has considered the past orientation, the benefits of which appear to be frequently moderated by its valence (Bryant, Smart, & King, 2005; Lyubomirsky & Nolen-Hoeksema, 1995).

Measuring time perspective

McGrath and Kelly's (1986) literature review identifies 211 different ways of approaching the concept of TP. In an attempt to organize disparate findings originating from inconsistencies in defining and operationalizing TP, Kazakina (1999) writes of six major dimensions contributing to the construct, namely temporal orientation, extension, density, emotional valence, temporal continuity and balance. However, few measuring tools have considered time perspective in all its complexity and across all three time orientations, with the majority focusing on a single temporal zone as the object of investigation (Kazakina, 1999).

Early attempts to measure TP were largely graphical, story-based or projective tests, e.g. the Future Events Test (Kastenbaum, 1961), the Story Completion Test (Barndt & Johnson, 1955) or the Time Metaphors (Knapp & Garbutt, 1958). These approaches exhibited extremely low test-retest reliability and low intercorrelations despite addressing the same temporal zone (Lessing, 1968). Later additions, such as Future Anxiety Scale (Zaleski, 1996), the Consideration of Future Consequences Scale (Strathman, Gleicher, Boninger, & Edwards, 1994), the Sensation-Seeking Scale (Zuckerman, 1994) and the Time Structure Questionnaire (Bond & Feather, 1988) have far superior psychometric properties, but still focus on one predominant time orientation, usually the future. Attempts to capture the complexity of temporal orientation in one instrument have ranged from the Time Reference Inventory (Roos & Albers, 1965), the Time Attitude Scale (Nuttin, 1985) and the Time Competence Scale (Shostrom, 1964) through to

the Stanford Time Perspective Inventory (Zimbardo, 1990). The later tool deserves a more thorough investigation as a precursor to the now dominant measure of TP, the Zimbardo Time Perspective Inventory.

The Stanford Time Perspective Inventory (STPI) developed by Zimbardo (1990) included five predominant orientations: past regret orientation; future achievement orientation; two types of present orientation – hedonistic and fatalistic; and time press factor. Nevertheless, the factor structure of this instrument appeared unstable. For example, Lennings (2000a) did not find strong consistency or reliability in the Fatalistic Present factor and suggested that a four-factor solution is preferable. Lennings (2000b) notes that other various factor analyses by Zimbardo of the original STPI revealed 4, 5 or 7 factors.

The Zimbardo Time Perspective Inventory (ZTPI) is the latest modification of the STPI and is argued to have addressed the shortcomings of the previous scales (Zimbardo & Boyd, 1999). It consists of five factors: Past-Negative (PN), Past-Positive (PP), Present-Hedonistic (PH), Present-Fatalistic (PF) and Future (F). This scale represents a step forward in multi-dimensional measurements of TP as it takes into account both the different temporal zones and also the dimension of emotional valence. The ZTPI has been demonstrated to have high test-retest reliability (ranging from 0.70 to 0.80 for different factors), good convergent and discriminant validity and is claimed to have a consistent five-factor structure accounting for 36% of the variance (Zimbardo & Boyd, 1999).

Since 1999, there have been no new TP inventories published, with ZTPI becoming the leading measure of TP. Much recent research effort has been focused on the translation and adaptation of ZTPI to different languages (Apostolidis & Fieulaine, 2004; Diaz-Morales, 2006; Sircova, Mitina, Boyd, Davydova, Zimbardo, Nepryakho, et al., 2007; Kairys & Liniauskaite, 2008; Sircova, Sokolova, & Mitina, 2008). Although most of these studies provide support for the ZTPI five-factor structure, there are a number of documented theoretical objections to it, including lack of valence in the future factor (Boniwell, 2009; Worrell & Mello, 2007). A number of empirical studies suggest the heterogeneity of some of the existing factors (PN, PH, FU), which have been split up further to yield eight-factor models demonstrating better fit in different cultures (Sircova & Mitina, 2008b).

Relationship between time perspective and measures of well-being

One of the unanswered questions with regard to time perspective concerns the relationship between different

temporal orientation profiles with well-being. The literature is divided on whether it is the future, present or the past orientation that is most conducive to well-being. Given positive associations between the future TP and important life outcomes, such as academic achievement and socio-economic status, a number of theorists and researchers have claimed that a focus on the future is fundamental to well-being and positive functioning (Kahana & Kahana, 1983; Kazakina, 1999; Wessman & Ricks, 1966; Wills, Sandy, & Yaeger, 2001; Zaleski, Cycon, & Kurc, 2001). However, Boniwell and Zimbardo (2004) have warned of the drawbacks of an excessive future orientation, such as workaholicism, few social connections, lack of a sense of community and cultural traditions. There are also some conceptual grounds though to suggest that a time orientation with a focus on the present is a necessary prerequisite for well-being (Boyd-Wilson, Walkey, & McClure, 2002). The fact that the experience of well-being can only take place in the here and now offers the present orientation a special status. It is questionable, however, whether risk-taking and substance abuse associated with high PH scores are conducive to well-being. Finally, recent research in the field of positive psychology suggests that a positive, somewhat nostalgic focus on the past increases happiness and well-being (Bryant et al., 2005). Given the theoretical and empirical assumptions underlying the above claims, the inconsistency of results can be potentially explained by differences in the measures used.

Three recent studies using the ZTPI with undergraduate student samples generally show more convergence in their findings, shedding some light on the benefits and drawbacks of each TP profile (Drake, Duncan, Sutherland, Abernethy, & Henry, 2008; Foret, Steger, & Frazier, 2004; Tov, 2004). All three studies found no relationship between the future orientation and measures of well-being. Only weak associations were found between PH and some measures of well-being, e.g. Drake et al. (2008) found a 0.15 relationship between PH and Subjective Happiness Scale (Lyubomirsky & Lepper, 1999). Finally, both past temporal orientations have shown the strongest associations with well-being measures. PN sub-scale was positively associated with negative affect, and negatively with past and current life satisfaction (Tov, 2004), general life satisfaction and meaning in life (Foret et al., 2004), as well as subjective happiness and mindfulness (Drake et al., 2008). However, the PP orientation was robustly positively related to positive affect, all sub-scales of temporal life satisfaction (Tov, 2004), as well as above-mentioned measures used in the other two studies.

Whilst the above results seem to suggest the supremacy of the past positive orientation, the findings with regard to the present TP are inconclusive and

would benefit from further investigation. Furthermore, it remains unclear why an orientation as conducive to positive functioning as the future one shows no association with well-being. In addition, all of the above studies utilized measures of hedonic well-being, which is centred on maximization of pleasure and minimization of pain, namely, subjective happiness, affectivity measures and satisfaction with life, which also largely reflects hedonic well-being (Keyes, Shmotkin, & Ryff, 2002; Vittersø, 2003; Vittersø, Oelmann, & Wang, 2009; Vittersø & Søholt, in preparation). It may be that the F factor is associated with eudaimonic well-being, rather than hedonic. Finally, all of the above studies have relied on the English-speaking samples, which is another issue the present paper seeks to address.

Balanced time perspective

Focusing predominantly on the future may bring academic success, or reminiscing may increase one's happiness, yet if a TP starts to dominate to the extent that it excludes or minimizes the others, it becomes dysfunctional. There are costs and sacrifices associated with emphasizing any one of the temporal zones. For example, even PP orientation has drawbacks that may include being excessively conservative, cautious, avoiding change and openness to new experiences and cultures, sustaining the status quo, or trying to apply old solutions to new problems. A balanced time perspective (BTP) has been proposed as a more positive alternative to living life as a slave to any particular temporal bias (Boniwell & Zimbardo, 2004; Boyd & Zimbardo, 2005). 'In an optimally balanced time perspective, the past, present and future components blend and flexibly engage, depending on a situation's demands and our needs and values' (Zimbardo, 2002, p. 62). Given that the BTP is theorized as a combination of high scores on PP, PH and F factors and low scores on the PN and PF sub-scales, it has been further hypothesized that the BTP will show a pattern of stronger relationships with well-being measures relative to any individual TP zone (Boniwell & Zimbardo, 2004).

Although the theoretical possibility of the BTP was suggested in a number of publications (Boniwell, 2009; Boniwell & Zimbardo, 2003, 2004; Boyd & Zimbardo, 2005; Kazakina, 1999; Rappaport, Enrich, & Wilson, 1985; Zimbardo, 2002), the first attempt to operationalize it empirically was undertaken by Drake et al. (2008). They have selected their BTP sub-sample as those individuals scoring below the 33rd percentile on PN and PF, and above it on PP, PH and F scales. The scores of the resulting BTP group on subjective happiness and mindfulness scales were found to be significantly higher than those of the rest of the sample.

This approach to operationalization of BTP, referred to here as a cut-off-point approach, seems hardly satisfactory from a psychological point of view. It appears that the cut-off criteria were chosen arbitrarily, without any evidence suggesting that they are optimal. Using these criteria, the percentage of participants with a BTP remains nearly constant in different samples (5% in the case of Drake et al., 2008) for the simple reason that the criterion is based on statistical characteristics of a sample, rather than on any consistent psychological differences between individuals.

The difficulty in creating a measure of BTP consists in the lack of a justifiable criterion thereof. A theoretical definition of BTP implies that participants exhibit a certain pattern of scores on the 5 ZTPI scales (moderate to high scores on F, PH and PP scales, and low scores on PN and PF scales). A research methodology designed to identify subsamples of individuals exhibiting similar patterns of scores or change trends has been developed by Magnusson (Magnusson, 1999, 2003; Magnusson & Mahoney, 2002; Magnusson & Törestad, 1993), who entitled it 'person-oriented approach.' In correlational studies this approach can be implemented by using hierarchical cluster analysis in order to find out, with some degree of approximation, the typical score patterns that exist within a given sample.

Person-oriented approach can be applied to TP not only as means to distinguish participants with a BTP, but, more generally, to explore typical TP profiles that exist within a sample. The idea of TP profiles is not recent: it has been developed by Lennings, Burns, and Cooney (1998), who proposed three distinct profiles based on the earlier work by Cottle (1969, 1977): *actualizer* (characterized by distant temporal horizons, positive attitude towards time and a strong sense of time awareness), *gestalt* profile (characterized by distant past extensions and negative attitude towards time) and *atomist* (characterized by present or near-future orientation without integration between the past and the future). According to Lennings et al. (1998), these profiles also differ in terms of one's capacity to delay gratification and control impulses (highest in an actualizer, lowest in an atomist). However, the operationalization of these profiles based on canonical correlation between a set of measures of TP and a set of related personality traits (Lennings et al., 1998) appears arguable. Canonical roots can only describe the latent variables explaining the variance common to both datasets (Stevens, 1986) but provide no information about the way *cases* are distributed across these dimensions thereby precluding any novel conclusions concerning the existence of any *distinct* personality types or profiles.

Theoretical support for the application of the person-oriented approach to ZTPI is provided by a

more recent work of Boyd and Zimbardo (2005) who proposed and described five hypothetical 'profiles' of individual TP that can be named *hedonistic* (high PH, low F), *future-oriented* (low PH, high F), *balanced* (high PH, high F), *risk-taking* (high PH, high PF) and *fatalistic* (high PF, low PH, low F). However, Boyd and Zimbardo only use the present and future ZTPI scales to describe each profile, so the way these patterns are related to the two past scales is unclear. They also note that empirical evidence showing the existence of the proposed profiles is still lacking. The aim of the research outlined in this article is to fill this gap by investigating the TP profiles using cluster analysis methodology.

Study 1

Aim

This study aimed to: (1) investigate the relationship between ZTPI and satisfaction with life across temporal domains, as well as other measures of subjective and eudaimonic well-being; (2) apply the person-oriented approach to explore the typical profiles of TP; (3) compare the cut-off-point and person-oriented approaches to operationalization of BTP; and (4) investigate the relationship between BTP and well-being.

Methods

Participants

The sample was comprised of undergraduates of the Open University and included 179 participants; 33 of them were male and 144 of them female (two participants failed to indicate their gender). The participants ranged in age from 18 to 58 years (the median age was 24).

Materials

The questionnaire included demographic items ascertaining age, gender, ethnicity and relationship status of the participants, and the following inventories:

The *Zimbardo Time Perspective Inventory* (Zimbardo & Boyd, 1999) is a 56-item self-report instrument, which measures participants' time-related attitudes and behaviours by asking them to rate, on a Likert scale, how true each statement is of them (1 being 'very untrue' and 5 being 'very true').

The *Temporal Satisfaction with Life Scale* (TSWLS; Pavot, Diener, & Suh, 1998) is a 15-item scale that provides a total life satisfaction score and also three sub-scales relating to past satisfaction with life, concurrent life satisfaction and future expectation of life satisfaction.

The *Positive and Negative Affect Schedule* (PANAS; Watson, Clark, & Tellegen, 1988) includes 20 emotion adjectives that are evaluated on a five-point scale to indicate the amount of time respondents spend experiencing each emotion. PANAS was shown to be highly internally consistent, with the positive affect (PA) and negative affect (NA) sub-scales largely uncorrelated with each other. A composite affect balance score can be calculated as the difference between PA and NA scores.

The *Time Competence Scale* forms a part of the Personality Orientation Inventory measuring self-actualization (Shostrom, 1963). It consists of 23 pairs of forced choice items. Higher scores on the scale reflect living in the present, planning effectively for the future, and having positive, rather than bitter, memories of the past.

The *Measure of Actualization of Potential* (MAP; Lefrançois, Leclerc, Dubé, Hébert, & Gaulin, 1997) is a brief, 27-item measure of self-actualization or eudaimonic well-being using a 5-point Likert scale. The items reflect openness to experience, including other people's and one's own emotional experience, autonomy, acceptance of life and adaptation.

Procedure

Participation in the study was voluntary; no remuneration was provided. The inventories were handed out to those volunteering to take part in the study during an Open University Summer School. The response rate was approximately 90%.

Results and discussion

ZTPI scale scores and correlations

The means and standard deviations obtained on this subset were compared using a two-tailed *t*-test to those achieved by Zimbardo and Boyd (1999) in their Stanford selection sample ($N=606$). The only significant difference between the two student groups were higher PF scores in the British sample ($t(783)=3.71$, $p < 0.001$, $d=0.32$); the results did not change when a

possible age difference effect was controlled for by selecting a subset of British students ($N=116$) within the same age range as the Stanford sample.

The intercorrelations between the ZTPI scales (see Table 1) obtained in the British sample followed the same pattern as those reported by Zimbardo and Boyd (1999). The alpha reliability coefficients for all five ZTPI scales obtained in the present sample were slightly lower: 0.79 for PN, 0.77 for PP, 0.76 for Future, 0.75 for PH and 0.68 for PF scales.

The relationship between ZTPI and well-being

The correlations between the ZTPI scales and the scales of subjective well-being are shown in Table 2. The highest (negative) correlate of well-being is the PN scale, the PP and PH being lower but still significant correlates of well-being. The correlations between the PF and well-being measures are rather low, while the F scale is not related to life satisfaction, positive affect and self-actualization at all. The magnitudes of correlations with the well-being scales are consistent with the data obtained by Drake et al. (2008).

In order to further investigate the relationship between temporal life satisfaction and ZTPI, an exploratory principal components analysis was performed on the set of ZTPI and TSWLS sub-scales,

Table 1. Pearson correlations between the ZTPI scales (British sample, $N=179$).

	1	2	3	4	5
1. Past-Negative	–	–0.13	0.13	–0.39***	0.24**
2. Present-Hedonistic		–	–0.34***	0.35***	0.17*
3. Future			–	0.02	–0.41***
4. Past-Positive				–	–0.07
5. Present-Fatalistic					–

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 2. Pearson correlations between the ZTPI and well-being scales (British sample, $N=179$).

Scale	Cronbach's alpha	Past-Negative	Present-Hedonistic	Future	Past-Positive	Present-Fatalistic
Time Competence	0.80	–0.58***	0.31***	–0.21**	0.34***	–0.09
TSWLS: Past	0.87	–0.62***	0.31***	–0.09	0.52***	–0.11
TSWLS: Present	0.91	–0.33***	0.27***	0.03	0.32***	–0.19*
TSWLS: Future	0.87	–0.34***	0.23***	0.04	0.31***	–0.24**
Positive Affect	0.87	–0.15*	0.34***	0.15	0.18*	–0.16*
Negative Affect	0.81	0.46***	–0.05	0.01	–0.28***	0.22**
Affect Balance	0.85	–0.38***	0.25**	0.09	0.29***	–0.24**
MAP	0.81	–0.46***	0.45***	–0.01	0.31***	–0.17*

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

yielding three factors which accounted for 69% of the total variance. The factors were interpreted as satisfaction with the past, satisfaction with the present and delayed gratification. The model was further tested by means of confirmatory factor analysis and was found to fit the data quite well with RMSEA = 0.0455, $\chi^2(13) = 18.03$ ($p = 0.156$), CFI = 0.975, NFI = 0.955 (see Figure 1).

The model reveals that the two past scales of the ZTPI are related to the latent factor named *satisfaction with the past*, as it is defined by the corresponding TSWLS scale. The second latent factor, named *satisfaction with life at present* (or simply *satisfaction with life*), is strongly related to the *satisfaction with present* and *satisfaction with future* scales of the TSWLS, and also to the *present hedonistic* scale of the ZTPI, although this relationship is not particularly strong. The third latent factor, termed *future/present balance*, or *delay of gratification strategy* (understood in terms of Mischel, 1974), explains the inverse relationships between the future and the two present scales of the ZTPI. It can be interpreted as a cognitive and behavioural strategy of delaying gratification to the future in a rational way, instead of pursuing it impulsively at present. The latent factors *satisfaction with the past* and *satisfaction with the present* are strongly related to each other, but not to the third latent factor, *delay of gratification* (a further path analysis revealed that only the first two of these factors

are significantly associated with positive and negative affect).

Three co-variances between the error terms were added, based on the consideration of the residual correlation matrix. They reflect the particular ways in which past experience is related to the present and future orientations. The correlation between PN and F suggests that future orientation may emerge as a result of negative past experiences or that future-oriented individuals appraise their own past more critically than hedonists do. The correlation between PN and PF scales suggests an opposite effect of negative past leading to fatalistic low-control strategy: this is in line with findings that psychological stress inhibits control and willpower (Metcalf & Mischel, 1999). The relationship between PP and PH may reflect either the effect of positive past experiences on the individual's ability to enjoy the present, or the overall tendency to savour pleasant experiences, whether they come from the past or the present.

Balanced time perspective and its relationship to well-being

In order to obtain a sub-sample of participants with a balanced time perspective using a cut-off point approach, two different criteria were applied. The BTP sub-sample, with selection based on the 33rd

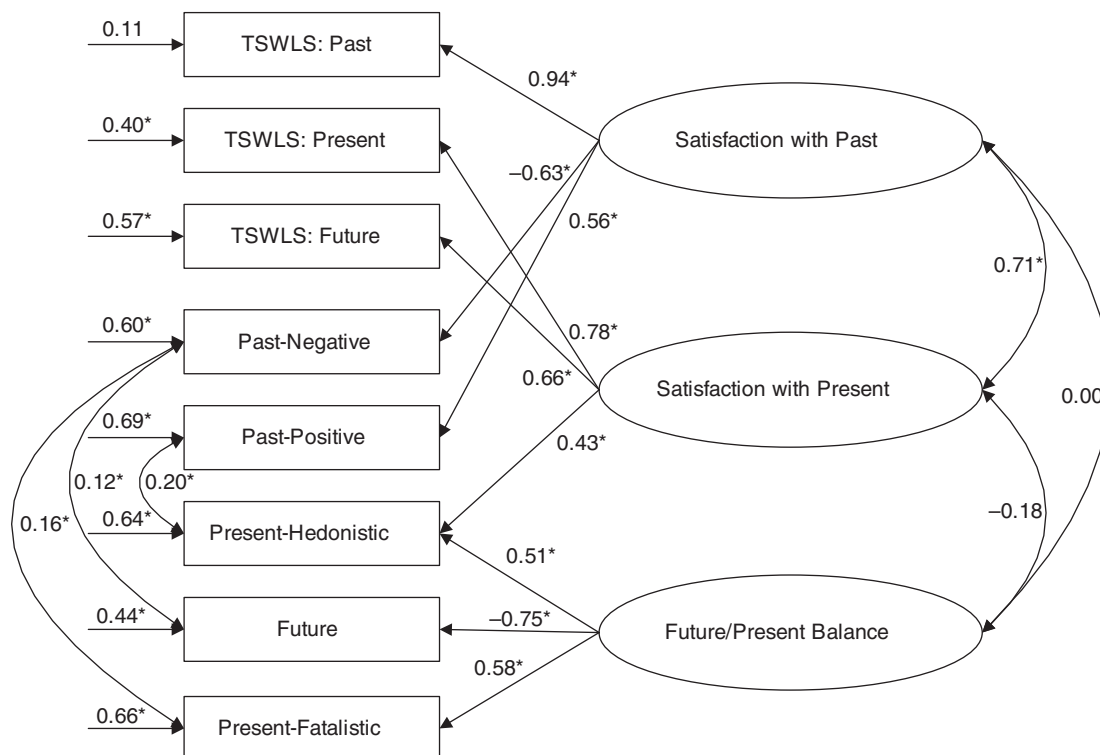


Figure 1. Structural model of relationship between ZTPI and TSWLS. Note: parameters significant at $p < 0.05$ are marked with an asterisk.

percentile criterion used by Drake et al. (2008), comprised 12 participants (10 females and 2 males). The differences in well-being indicators between the BTP and non-BTP sub-samples were tested by means of the Student *t*-test (see Table 3). The BTP sub-sample showed higher life satisfaction with all three temporal domains, lower negative affect and higher MAP scores.

When the cut-off point was set at the 50th percentile (as proposed by Boniwell), the results were very similar: the BTP sub-sample comprised 12 participants (11 females and 1 male), only 8 of whom also belonged to the BTP group based on the 33rd percentile (50% overlap, calculated as a percentage of matching participants from the total number of participants in the two groups). The BTP sub-sample showed higher satisfaction across all temporal domains, higher positive affect, and higher scores on the MAP and on Time Competence scale of the POI.

An operationalization of BTP based on the person-oriented approach was also tested. Hierarchical cluster analysis using Ward's method and Squared Euclidean metric was applied to standardized scores on five ZTPI sub-scales in order to identify the groups of individuals exhibiting similar score patterns within our sample. In choosing the number of clusters a strategy similar to that of exploratory factor analysis was adopted: the number of clusters was increased as long as differences between clusters remained statistically significant and of sufficient magnitude to be interpretable. Based on this strategy, a four-cluster model of the sample was selected.

No significant gender (Pearson Chi-square test) and age (Kruskal-Wallis test) differences were found between the clusters. The differences on psychometric scales between the four clusters were tested using one-way ANOVA and were significant for all the scales used, except for Positive Affect scale (see Table 4).

The first cluster ($N=58$) was characterized by high PH scores and low future; the PF scores were also

rather high, with PP slightly above and PN slightly below average. This pattern of scores was interpreted as hedonistic, present-oriented, as it satisfies the Boyd and Zimbardo (2005) criteria.

The second cluster ($N=58$) demonstrated an inverse picture: it was characterized by high future and low PH scores, with above-average PN and below-average PP and PF. This pattern shows a dominantly future orientation and satisfies the Boyd and Zimbardo (2005) criteria. The third cluster ($N=41$) presented a more balanced picture: above-average scores on future and PP scales, below-average scores on PH and low scores on PN and PF. This pattern was interpreted as balanced time perspective. This cluster included, correspondingly, 12 out of 12 and 11 out of 12 participants chosen earlier in the BTP sub-samples using the two variants of the cut-off-point approach. However, this cluster does not completely satisfy the Boyd and Zimbardo (2005) BTP criteria, as it shows only moderate scores on the three 'positive' TP scales alongside the low scores on the two 'negative' scales.

The fourth cluster ($N=22$) was characterized by high scores on the PN and PF scales in association with average scores on PH and low scores on the future and PP scales. This pattern, interpreted as negative TP, is nearly inverse to BTP and corresponds roughly to the fatalistic profile proposed by Boyd and Zimbardo (2005). When the third cluster (BTP sub-sample) was compared to the three remaining clusters, the observed differences were similar in magnitude to those obtained using the cut-off-point criteria of BTP. Members of the BTP group demonstrated higher satisfaction with life in the past, present and future, lower negative affect, more positive affective balance and higher self-actualization scores.

The well-being patterns exhibited across the four clusters by each of the measures used in this study were surprisingly similar (see Figure 2). In terms of subjective well-being, clusters one and three demonstrated a

Table 3. Comparison between the balanced time perspective group and the rest of the sample (British sample, $N=179$).

Scale	Balanced time perspective criterion					
	33rd percentile		50th percentile		Cluster	
	<i>t</i> (175)	Cohen's <i>d</i>	<i>t</i> (175)	Cohen's <i>d</i>	<i>t</i> (175)	Cohen's <i>d</i>
Time Competence	-1.60	0.48	-2.13*	0.67	-2.83**	0.51
TSWLS: Past	-3.71***	1.12	-2.84**	0.85	-3.84***	0.69
TSWLS: Present	-2.93**	0.88	-2.57*	0.77	-2.07*	0.37
TSWLS: Future	-2.87**	0.86	-3.26**	0.98	-2.89**	0.52
TSWLS Total	-3.98***	1.19	-3.56***	1.07	-3.64***	0.65
Positive Affect	-1.68	0.50	-2.09*	0.63	-1.13	0.20
Negative Affect	2.74**	-0.82	1.96	-0.59	3.05**	-0.55
Affect Balance	-2.78**	0.84	-2.59*	0.78	-2.59*	0.46
MAP	-3.27**	0.98	-3.36***	1.01	-2.56*	0.46

Note: Two-tailed Student *t*-test was used. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 4. Cluster means and one-way ANOVA results (British sample, $N = 179$).

Scale	Cluster mean				F(3,175)	η^2
	1	2	3	4		
Past-Negative	2.78	3.29	2.22	3.71	65.93***	0.53
Present-Hedonistic	3.81	3.20	3.33	3.43	28.51***	0.33
Future	3.05	3.87	3.56	3.11	47.92***	0.45
Past-Positive	3.88	3.55	3.87	2.86	27.92***	0.32
Present-Fatalistic	2.84	2.42	2.08	3.04	34.33***	0.37
Time Competence	14.90	11.72	14.76	10.50	16.26***	0.22
TSWLS: Past	23.53	18.93	24.93	15.05	16.99***	0.23
TSWLS: Present	24.60	23.16	25.85	20.14	3.72*	0.06
TSWLS: Future	22.81	22.16	25.15	21.09	3.28*	0.05
TSWLS Total	70.95	64.25	75.93	56.27	10.21***	0.15
Positive Affect	35.17	33.59	35.68	33.09	1.04 (n.s.)	0.02
Negative Affect	19.05	20.29	16.90	24.91	7.76***	0.12
Affect Balance	16.12	13.30	18.78	8.18	5.20**	0.08
MAP	99.24	94.25	101.06	91.77	5.61**	0.09

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

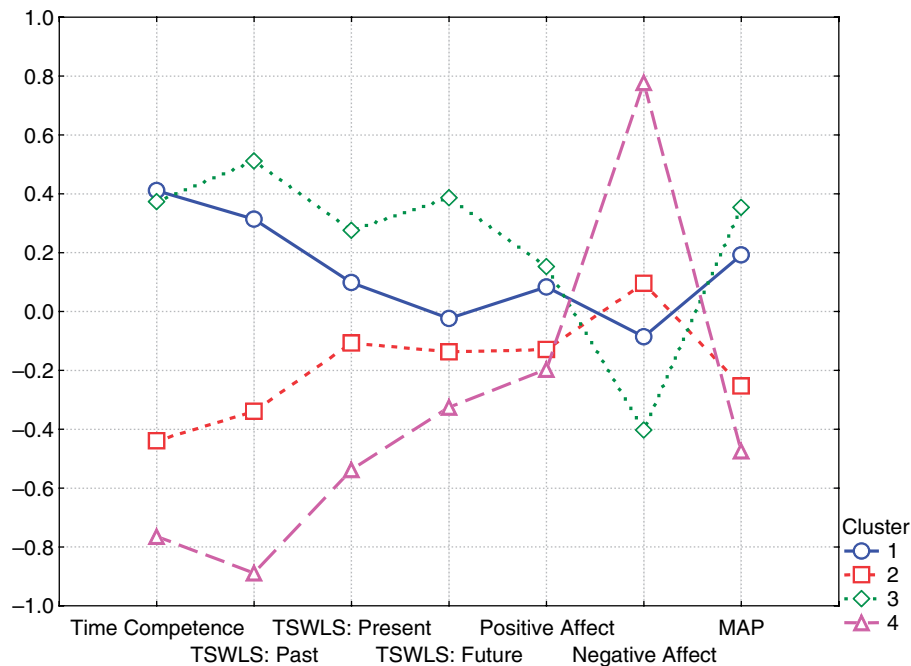


Figure 2. Standardized mean well-being scores of the four TP clusters (British sample).

similarly positive picture, with no significant differences (Tukey HSD post-hoc test was used). In contrast, the subjective well-being picture exhibited by clusters two and four was similarly negative, the only difference being higher negative affect ($p < 0.05$) in cluster four. In turn, a number of significant post-hoc differences were found between each of the ‘positive’ and ‘negative’ clusters (not presented for the sake of brevity).

Overall, the two variants of the cut-off-point approach used have produced very similar results in terms of significance of the differences between the BTP and non-BTP groups, as well as effect sizes (ranging from moderate to high), but the resulting BTP

groups did not overlap completely: the cluster-analysis operationalization produced a larger BTP group (23% of the sample, as opposed to 7% using the cut-off point approach). Although the effect sizes were smaller than those obtained using a cut-off-point criterion, cluster analysis has allowed a larger number of participants exhibiting a pattern of scores similar to BTP to be distinguished.

Study 2

Aim

The aims of this study were to: (1) apply the person-oriented approach to identify the typical profiles of TP

in a different culture and see how they compare to the British data; (2) compare the cut-off-point and person-oriented approaches to operationalization of BTP in a different culture; and (3) investigate the relationship between BTP and a wider range of hedonic and eudaimonic well-being variables. The data were collected in Russia.

Methods

Participants

Participants were undergraduate students of several Russian universities in Moscow, Taganrog (south of Russia) and Petropavlovsk-Kamchatsky (far east of Russia). The sample included 289 participants, 132 males and 157 females, aged between 20 and 31 years (median age 22 years).

Materials

The questionnaire included demographic items in order to obtain the age and gender of the participants. The set of well-being measures was extended to include both hedonic and eudaimonic well-being measures:

Zimbardo Time Perspective Inventory (Russian language version by Sircova et al., 2008). The Russian version of the ZTPI uses the same set of items reproducing the original five-factor structure with minor differences (items 7 and 11 load onto PN instead of PP, item 25 loads onto PN, item 52 loads onto PH and FU instead of PF).

Subjective Happiness Scale (Lyubomirsky & Lepper, 1999; Osin & Leontiev, 2008), a Russian adaptation of the four-item brief measure of perceived happiness.

Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985; Osin & Leontiev, 2008), a Russian adaptation of the five-item measure of satisfaction with life.

Purpose In Life test (Crumbaugh & Maholick, 1981; Leontiev, 1992), a 20-item instrument measuring life meaning as presence of goals, satisfaction with past self-realization, enjoyment in the process of life, and a control attitude towards life. Each item is a pair of opposite statements rated on a seven-point symmetrical scale.

Generalized Self-Efficacy Scale (Schwarzer, 1993; Schwarzer, Jerusalem, & Romek, 1996), a Russian translation of the original instrument. The scale includes 10 items reflecting confidence in one's ability to achieve goals and cope with difficult situations.

Success and Failure Explanatory Style Questionnaire (Gordeeva, Osin, & Sheviakhova, 2009), an original 48-item instrument based on ASQ (Peterson et al., 1982) measuring three parameters of optimistic attributional style (permanence,

Table 5. Pearson correlations between the ZTPI scales (Russian sample, $N = 289$).

	1	2	3	4	5
1. Past-Negative	–	–0.03	0.09	–0.38***	0.35***
2. Present-Hedonistic		–	–0.28***	0.20**	0.17**
3. Future			–	0.16**	–0.33***
4. Past-Positive				–	0.06
5. Present-Fatalistic					–

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

pervasiveness and controllability) across a set of 24 positive and negative situations (only the total optimism score was used in this study).

Balanced Inventory for Desirable Responding (Paulhus, 1998; Russian version by Osin, in press) was included to assess the possible response bias. The 58-item questionnaire includes Self-Deceptive Enhancement (SDE), Impression Management (IM) and Self-Deceptive Denial (SDD) scales with reliabilities in the 0.80–0.82 range.

Procedure

The participation in the study was voluntary; no remuneration was provided. The inventories were distributed amongst university students with instructions to complete and return them. Participants were asked to sign the questionnaires using any nickname of their choice.

Results and discussion

ZTPI scale inter-correlations and reliability

Using the keys provided by Sircova (2008), the alpha reliability values of the Russian version of the ZTPI obtained in the present sample were comparable to those of the English version (0.78 for F and PH, 0.77 for PN and 0.68 for PF), except for the PP scale which showed a lower reliability of 0.64. The pattern of significant correlations between the Russian ZTPI scales (see Table 5) was also quite similar to the English version, with the addition of a weak correlation ($r = 0.16$, $p < 0.01$) between the PP and F scales.

The relationship between TP and well-being

Significant correlations were found between measures of subjective well-being and the Russian ZTPI scales (see Table 6). The PN scale was the closest correlate to well-being measures, followed by the PF and PP scales. The PH scale only showed a modest correlation with

Table 6. Pearson correlations between the ZTPI and well-being scales (Russian sample, $N = 289$).

Scale	Cronbach's alpha	Past Negative	Present Hedonistic	Future	Past Positive	Present Fatalistic
Satisfaction With Life	0.75	-0.45***	0.05	0.14*	0.21***	-0.23***
Subjective Happiness	0.75	-0.51***	0.18**	0.09	0.29***	-0.22***
Purpose In Life	0.87	-0.46***	0.10	0.36***	0.25***	-0.52***
Generalized Self-Efficacy	0.85	-0.26***	0.14*	0.04	0.02	-0.30***
Optimism	0.83	-0.27***	0.20**	0.28***	0.21***	-0.27***

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 7. Comparison between the balanced time perspective group and the rest of the sample (Russian sample, $N = 289$).

Scale	Balanced time perspective criterion					
	33rd percentile		50th percentile		Cluster	
	$t(286)$	Cohen's d	$t(286)$	Cohen's d	$t(286)$	Cohen's d
Satisfaction With Life	-3.71***	0.84	-2.42*	0.61	-5.03***	0.99
Subjective Happiness	-3.66***	0.83	-3.29**	0.83	-4.70***	0.92
Purpose In Life	-4.71***	1.07	-4.94***	1.24	-6.60***	1.32
Generalized Self-Efficacy	-1.89 (n.s.)	0.43	0.69 (n.s.)	-0.17	-2.64**	0.52
Optimism	-3.14**	0.72	-3.84***	0.94	-4.63***	0.93

Note: Two-tailed Student t -test was used. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

the SHS scale and did not reveal any significant correlations with SWLS and PIL. The future scale showed weak but significant associations with life satisfaction and optimism, and a moderate association with purpose in life.

Balanced time perspective and its relationship to well-being

Measures of balanced time perspective were calculated in the same way as in Study 1. The differences between BTP and non-BTP sub-samples were compared using t -tests (see Table 7). When the 33rd percentile cut-off criterion was used, the resulting BTP sub-sample included 20 participants (13 females and 7 males) showing significantly higher happiness, satisfaction with life, purpose in life and optimism than the remaining sample. The 50th percentile cut-off criterion produced a group of 18 participants (12 females and 6 males), exhibiting the same set of significant differences. Ten out of 18 participants also belonged to the BTP group based on the 33rd percentile cut off (36% overlap between the two groups).

In order to obtain a BTP group using the person-oriented approach methodology, hierarchical cluster analysis using Ward's method and Squared Euclidean metric was performed on standardized scores on the five ZTPI scales. Applying the same strategy of retaining interpretable clusters, a five-cluster model was chosen. No significant gender and age differences were found between the clusters.

The differences on psychometric scales between the five clusters were tested using one-way ANOVA and were significant for all the scales used (see Table 8). The first cluster ($N = 73$) showed above-average scores on PF and PN associated with slightly above-average scores on the remaining three ZTPI scales. This rather diffuse pattern of scores corresponds most closely to the risk-taking profile definition (Boyd & Zimbardo, 2005). The second cluster ($N = 29$) was characterized by above-average to high scores on future and PP scales, average scores on the PH scale and low scores on the PN and PF scales, which satisfies the BTP criteria. This cluster included, correspondingly, 14 out of 20 and 10 out of 18 members of the BTP groups selected using the two variants of the cut-off-point approach.

The third cluster ($N = 65$) exhibited above-average scores on the F scale associated with below average scores on the remaining four scales of the ZTPI. This pattern was interpreted as future orientation. This cluster included 4 out of 20 and 5 out of 18 members of the BTP sub-samples. Characteristic of the fourth cluster ($N = 79$) were above-average scores on the PH and PP scales, average scores on the PF scale and below average scores on the future and PN scales. This pattern was interpreted as hedonistic orientation towards the present.

Finally, the fifth cluster ($N = 42$) was characterized by extremely high scores on the PN scale and extremely low scores on the PP scale, alongside above-average scores on the PF scale and below-average scores on the

Table 8. Cluster means and one-way ANOVA results (Russian sample, $N=289$).

Scale	Cluster mean					F(4,283)	η^2
	1	2	3	4	5		
Past-Negative	2.86	1.81	2.36	2.23	3.27	72.43***	0.51
Present-Hedonistic	3.52	3.46	3.04	3.78	3.11	29.01***	0.29
Future	3.70	4.03	3.83	3.18	3.17	32.04***	0.31
Past-Positive	3.87	4.07	3.60	3.99	2.83	54.14***	0.43
Present-Fatalistic	3.06	1.75	2.14	2.70	2.82	70.06***	0.50
Satisfaction With Life	20.74	26.62	22.92	22.78	17.90	15.38***	0.18
Subjective Happiness	18.70	22.79	20.45	20.73	16.48	19.32***	0.22
Purpose In Life	100.39	121.32	110.52	105.95	89.57	33.36***	0.32
Generalized Self-Efficacy	29.66	32.86	31.48	31.58	28.95	5.95***	0.08
Optimism	211.05	228.10	212.49	211.48	196.59	10.54***	0.13

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

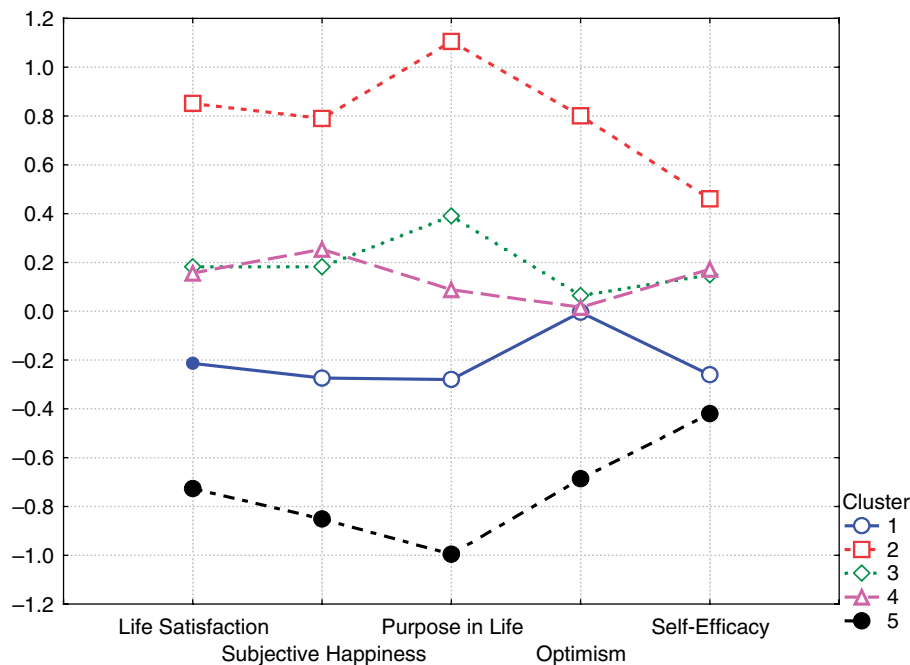


Figure 3. Standardized mean well-being scores of the five TP clusters (Russian sample).

PH and future scales. This pattern, nearly opposite to that of BTP, was interpreted as negative TP. When the BTP group (Cluster 2) was compared to the remaining sample using the Student t -test, the differences on well-being scales were not only all significant, but also higher in magnitude than those obtained using the cut-off-point criteria, which speaks in favour of the person-oriented operationalization of BTP.

In terms of well-being a nearly uniform pattern was found for all the six scales used (see Figure 3). Cluster 2 demonstrated the highest scores, followed by Clusters 3 and 4 with above-average scores, Cluster 1 with below-average scores on the subjective well-being scales, and Cluster 5 with the lowest. Differences between the clusters were tested using the Tukey HSD

post-hoc test. No significant differences were found between Clusters 3 and 4; all other clusters revealed a large number of significant differences (not presented here for the sake of brevity).

Significant differences were found between the five clusters on two out of three social desirability scales (SDE and SDD: $p < 0.001$, $\eta^2 = 0.08$ in both cases). However, only the differences on the SDE scale were significant between the BTP and non-BTP sub-groups using the 50th percentile ($t(281) = -2.32$, $p < 0.05$, $d = 0.58$) and the cluster criterion ($t(281) = -4.03$, $p < 0.001$, $d = 0.79$). The evidence suggesting that the SDE scale may capture valid personality content, such as self-efficacy (Osin, 2009; Paulhus, 1998), combined with the fact that no significant differences on two

other BIDR scales were found, allows us to conclude that the differences in well-being between the BTP and non-BTP groups can not be attributed to social desirability bias.

Cross-sample comparison

In order to provide for a cross-sample comparison, construct equivalence was assumed between the corresponding scales of the English and Russian versions of the ZTPI, and between the two life satisfaction (LS) measures: the Satisfaction with Present sub-scale of the TSWLS and the SWLS scale, which have the same item content. The raw scores on those scales were standardized within each sample and are presented in Table 9. The *z*-scores were compared for the corresponding clusters between the two samples using the two-tailed Student *t*-test.

Interpretation of both clusters as hedonistic satisfies the Boyd and Zimbardo (2005) hedonistic profile criteria. Clusters do not differ significantly in scale scores or in size. However, the LS scores associated with this pattern are only moderate in both samples.

Similarly, the future-oriented pattern satisfies the Boyd and Zimbardo (2005) criteria in both samples, although in the Russian sample it has lower PN ($t(121)=4.43, p < 0.001$) and PF ($t(121)=2.71, p < 0.01$) components, and its proportion within the overall sample is also smaller ($p < 0.05$).

The BTP pattern does not completely satisfy the Boyd and Zimbardo (2005) criteria in that it only exhibits moderate PH scores, but appears to be the

most advantaged in terms of well-being. In the Russian sample the corresponding group has higher future ($t(68)=2.43, p < 0.05$) and lower PF ($t(68)=2.14, p < 0.05$) components, is smaller in size ($p < 0.001$) and shows higher LS scores ($t(68)=2.35, p < 0.05$) than its British counterpart. These differences result, most likely, from the fact that the group corresponding to this pattern is smaller in the Russian sample and, therefore, exhibits more extreme scores. Although in Study 2 this group had the highest F mean score, it did not differ significantly from that of the future-oriented group.

The group interpreted as negative in the UK sample exhibits a high PF score and presents a blurred picture of the fatalistic and risk-taking patterns proposed by Boyd and Zimbardo (2005). The only significant difference between the two negative pattern groups is a higher Future mean ($t(62)=4.83, p < 0.001$) in the UK group, where high Future is also paradoxically associated with high fatalism. This may reflect cultural differences in the strategies people use to cope with negative past experiences. This pattern was labelled negative to reflect its relationship to well-being; it presents an inverse picture to BTP and shows the lowest LS scores in both samples.

The fact that a distinct risk-taking pattern characterized by high fatalism only emerged in the Russian sample can be explained by the existing findings indicating very high fatalism as a specific feature of the Russian culture (Aycan et al., 2000), as well as the evidence that Russians do not see a clear and predictable life as meaningful (Osin, 2007). This cluster

Table 9. Cross-sample comparison of the time perspective clusters.

Cluster(number)	Cluster membership			Standardized scores (<i>z</i> -scores)					
	<i>N</i>	%	BTP, <i>N</i>	PN	PH	F	PP	PF	SWLS
Hedonistic, present-oriented									
UK (1)	58	32.4	0	-0.22	0.79	-0.73	0.40	0.52	0.10
Russia (4)	79	27.4	2	-0.49	0.67	-0.63	0.47	0.19	0.15
Future-oriented									
UK (2)	58	32.4	0	0.53***	-0.57	0.80	-0.16	-0.25**	-0.10
Russia (3)	65	22.6	4	-0.27***	-0.70	0.50	-0.19	-0.74**	0.18
Balanced time perspective									
UK (3)	41	22.9	12	-1.06	-0.28	0.24*	0.39	-0.85*	0.28*
Russia (2)	29	10.1	14	-1.17	0.08	0.83*	0.60	-1.37*	0.85*
Negative									
UK (4)	22	12.3	0	1.15	-0.06	0.63***	-0.136	0.87	-0.54
Russia (5)	42	14.6	0	1.20	-0.57	-0.64***	-1.46	0.39	-0.72
Diffuse, risk-taking									
Russia (1)	73	25.3	0	0.55	0.19	0.27	0.26	0.78	-0.21

Note: Numbers are given for corresponding clusters within the British and Russian samples; *N* = the number of participants in each cluster; % = percentage from the total sample size; BTP, *N* = the number of participants selected based on 50th percentile criterion in the cluster; significance levels are given for cross-sample two-tailed Student *t*-test: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

exhibits moderate well-being scores and allows us to hypothesize that the fatalistic attitude may emerge as a coping strategy used by people in the precarious situation of a society in transition. In turn, the associations of high Future with high PN and PF in the future-oriented and negative groups, correspondingly, are found only in the British sample and call for additional research into cultural differences in the delay of gratification strategy.

The correspondence (percentage of matching participants) between the cut-off and cluster operationalizations of the BTP was slightly lower in the Russian sample, whereas the BTP and future-oriented pattern were not as distinct as in the UK sample. Indeed, in a four-cluster solution for the Russian sample these two clusters were joined, encompassing 18 out of 20 BTP individuals. However, the resulting cluster could not be definitely interpreted, exhibiting a blurred picture of both future-oriented and BTP patterns, which is why a five-cluster model was chosen.

A possible limitation of the present analysis is the age difference between the two samples: although the median ages are nearly equal, the majority of the British sample comprised younger students (ages 18–20, $N=116$) with nearly uniform age distribution in the remaining age range (21–58), whereas the Russian sample was much more homogeneous (ages 20–23, $N=270$), the proportion of older students being negligible. Unfortunately, the age distribution did not allow the creation of sub-samples of equal age.

When the analysis was repeated for the younger British sub-sample ($N=116$), a five-cluster model emerged with the hedonistic cluster split into purely hedonistic (high PH and PP, moderate PN, PF and future) and present-oriented (moderate PH, PF and PP, low PN and future). The means of three other clusters (future-oriented, balanced and negative) presented a very close picture to that obtained in the Russian sample. The BTP cluster (10.1%), though smaller than that obtained in Study 1, completely overlapped with it. The results suggest that present orientations might be more prevalent in younger populations (45.7% for hedonistic and present-oriented patterns together), with BTP (10.1%) and future-oriented (25.9%) being slightly less common than in older adults. The fatalistic/diffuse pattern found in the Russian sample did not emerge, which supports the notion of its cultural specificity. Overall, the picture presented by the younger British sub-sample overlapped quite well with that of the complete Study 1 sample, but was somewhat closer to the Russian one.

To summarize, only three out of five TP profiles proposed by Boyd and Zimbardo (2005) were found in both studies. In addition, a negative TP profile emerged in both samples, exhibiting an inverse picture to BTP and showing the lowest well-being scores.

The data provide only limited support for the existence of risk-taking and fatalistic profiles as distinct TP patterns, which needs to be confirmed in future studies.

General discussion

The data indicate that the inter-correlation structure and psychometric properties of the ZTPI scales within the British and Russian student populations are quite similar to those reported by Zimbardo and Boyd (1999). Also, as expected, ZTPI scales were weakly to moderately correlated with subjective well-being scales, and these correlations were quite similar in both samples. PN, PP and PF were moderately associated with well-being measures, whereas the relationships of the PH and F to hedonic well-being scales were weak, especially in the Russian sample; these findings correspond to conclusions reached by Drake et al. (2008). However, when eudaimonic well-being measures were added, the F scale showed weak to moderate associations with purpose in life and optimism, whereas the PH scale was not as strongly associated with these variables.

The weak correlation between the F scale of the ZTPI and the hedonic well-being scales can be explained by the differences in typical individual time-orientation patterns. People with a dominant future orientation are inclined to delay gratification and consequently have lower levels of subjective well-being, whereas people with BTP whose future orientation is associated with PH and PP have higher well-being. This resulted in weak overall association between F and hedonic well-being scales in the total sample. The existing findings on ego control (Funder, 1998) suggest that the delay of gratification may only be beneficial for subjective well-being in moderation, so that it still allows one to obtain pleasure from everyday activity. However, future orientation is associated with eudaimonic well-being and may be conducive to achieving important long-term goals.

The results of our exploratory and confirmatory factor analyses make it evident that the ZTPI scales corresponding to different time domains differ sufficiently in terms of the subjective-well being content they tap into. The two past scales largely reflect one's satisfaction with the past, possibly determined by negative experiences of one's past (Krause, 2004). These two scales tap mostly into the affective dimension of experience, which explains their closer association, compared to the other ZTPI scales, with hedonic well-being measures, such as PANAS.

The PH scale reflects the satisfaction with life at present (further projected onto the future), but this association is only moderate because this scale also taps into the delay of gratification factor completely unrelated to hedonic and short-term well-being. The tendency to savour the present moment is related

to the tendency to savour positive past experiences (as the correlation between PH and PP scales shows). Satisfaction with the present is strongly related to satisfaction with the past: additional studies are needed to explore to what extent the present satisfaction with life is determined by past experiences, and the cognitive appraisal of the latter is influenced by the present life situation.

In turn, the association between the future and PF scales reflects one's active/passive attitude towards the future, and the association between future and PH scales reflects one's future/present gratification balance. The three scales thus represent an individual cognitive and behavioural strategy, rather than a positive or negative attitude towards corresponding temporal loci, which makes them quite different from the past scales. Negative past experiences might influence this strategy in inverse ways.

We propose a distinction between three aspects of TP that the ZTPI scales appear to tap into: (1) *temporal locus* of individuals' cognitive representation of their life (tendency to live in the past, present moment or in the future); (2) *valence*, a positive or negative attitude towards past, present and future; and (3) *personal strategies* used by individuals that relate their behaviour to the temporal context (e.g., enjoying the present vs. living for the future). It has some correspondence to the distinction between temporal extension, temporal attitude and time structure proposed by Lennings et al. (1998).

It is not quite clear to what extent the ZTPI measures the first of these elements. The two past scales tap mainly into the valence dimension of past experience, whereas the present and future scales assess cognitive and behavioural strategies related to delayed gratification and only to some extent tap into the valence dimension of the present TP. It can be argued, though, that the future dimension of TP also has a valence component represented by such phenomena of human experience as hope, joy of anticipation and future anxiety (MacLeod & Byrne, 1996; Rappaport, 1991). Moreover, it can be argued that cognitive and behavioural strategies can be found not only in relation to future (activity, delayed gratification vs. passivity) and present (hedonistic engagement vs. fatalistic disengagement), but also to past experiences: people can be inclined to treasure and relive their past (Bryant et al., 2005), to distance themselves from it, or to use it in order to learn something for the future. The future measures of TP may be refined in order to address the distinction between these three elements.

The heterogeneity of the ZTPI scales results from the fact that they were developed using factor analysis of a rather arbitrary set of items, in which, it can be argued, the valence and strategy aspects of subjective experience related to time were not represented equally across the three temporal loci. Therefore, although the

ZTPI is a well-established, valid and reliable measure, it is not comprehensive. Such measures could be developed, based upon extensive pools of items formed on the basis of theoretical analysis.

To investigate the relationship between TP and well-being we used the theoretical notion of balanced time perspective proposed by Boniwell and Zimbardo (2004). Although its operationalization by Drake et al. (2008) is valid, we argue that it is not optimal, being based on arbitrarily fixed cut-off points irrelevant to psychological differences between individuals. The person-oriented approach suggests a different methodology: applying classification methods allows us to distinguish a group of individuals who exhibit a BTP score pattern within any given sample. The results we obtained using hierarchical cluster analysis indicate that an argument can be made to support the view that this approach to operationalization of the BTP is superior. The data suggest that percentage of participants with BTP is higher, at least in the undergraduate student population, than the cut-off criteria indicate.

Five distinct TP patterns were identified, four of those reproduced in both British and Russian samples. These patterns were associated with different levels of well-being: the BTP pattern was associated with the highest well-being levels, followed by the hedonistic and future-oriented patterns; the risk-taking and, more pronouncedly, the negative patterns were associated with low well-being levels. This association holds not only for hedonic well-being variables, but also for purpose in life and constructive thinking measures (self-efficacy, optimistic attributional style). The results do not make clear whether this association is causal. In order to confirm the existence of distinct TP profiles, additional studies are needed using representative, rather than convenience, samples. Cross-sectional studies using age-restricted samples of equal size could provide more information about age differences in the TP patterns.

The cluster analysis methodology used in the present research has a number of potential drawbacks. The first is the lack of statistical criteria which could be used to evaluate the fit of a cluster structure to the data and to compare different structures. Although such criteria exist (Everitt, Landau, & Leese, 2001), they are not widely used and are not implemented in most statistical software. Second, when cases, rather than variables, are classified there are only limited possibilities for cross-sample comparison of independent cluster structures, and no way of 'reproducing' a cluster structure on another sample. Third, not only are the cluster analysis outcomes as difficult to interpret as those of exploratory factor analysis, but this difficulty also increases with sample size. However, we believe that the possibility of finding out the typical individual profiles offered by this approach compensates for its drawbacks.

Conclusions

The obtained data shed additional light upon the relationship between time perspective and well-being. It appears that individual ZTPI scale patterns allow us to distinguish individuals with higher well-being better than individual scale scores. This explains the non-existent relationship between the subjective well-being measures and future orientation: the latter is only conducive to well-being within the context of balanced time perspective, when it is balanced by a fair share of the Present-Hedonistic and Past-Positive orientations. When the future orientation is predominant, it does not influence hedonic well-being strongly (at least, in the short term). The data support the idea of TP profiles proposed by Boyd and Zimbardo (2005).

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