







Development of Psychological Time Perspective: The Types, Predictors, and Trends

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A nationwide sample ($N = 2201$, aged 15-89) from the Czech Republic was administered the Zimbardo Time Perspective Inventory (ZTPI) along with demographic, social, and attitudinal questions to reveal developmental shifts in the Future, Present-Hedonistic, Present-Fatalistic, Positive-Past and Negative-Past dimensions. It turned out that age was not the only significant developmental factor (bivariate analyses were scrutinized by multiple linear regression, which yielded additional predictors for individual ZTPI dimensions, such as education, employment, marital status, health, political leaning, or religiousness; some were more significant than age). Latent class analysis (LCA) was then used to identify meaningful time perspective patterns, which corresponded to distinctly different developmental tasks and coping strategies: Hedonic pattern typical for the young (16%), Empowered pattern usual for mid-age adulthood (characterized by high future commitment along with low fatalism and low hedonism; 25%), and two patterns typical for aging – prevalently positive Moderate pattern (39%) and Past-Oriented Fatalism (20%). Predictors for LCA classes and ZTPI dimensions provide leads for fostering healthy time perspective.

Key words: time, time perspective, ZTPI, development, life-span, aging

Introduction

Psychological time perspective (TP) is a complex temporal apperception. It involves various concurrent psychological processes – cognitive, emotional, conative, and social (Lennings, 2000; Boniwell & Zimbardo 2004); at the same time, it is multidimensional, con-

sisting of the ‘trinity’ of past, present, and future dimensions. Time perspective, thus, is not just a psychological emotional experience (anchoring one to a various degree to present, past or future) but also temporal cognitive span linked to conative ability.

During the recent fruitful decades of research in psychological time, the Zimbardo Time Perspective Inventory (ZTPI) and its

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modifications proved to be the most practical assessment instruments. ZTPI has been successfully used in various languages and cultures (Zimbardo & Boyd, 1999; Lukavska et al., 2011; Sircova et al., 2007, 2014; Stolarski, Fieulaine, & van Beek 2015).

Developmental Views of Time Perspective

So far, most studies involving assessment of TP were conducted on student convenience samples, lacking the extended developmental perspective. Even when participants of a wider age range were recruited, they were often self-selected volunteers. A comprehensive view of developmental aspects of TP across the life span in a nation-wide sample is not available. This lack has been recognized by Laureiro-Martinez, Trujillo, and Unda (2017), who executed at least a meta-analysis of studies where age was a covariate of some of the TP dimensions.

Still, numerous studies mention ontogenetic changes of individual time dimensions. The relationship between the *present TP* and age has been researched most thoroughly. Adolescence is being reliably found as the peak of the present time orientation. This phenomenon is typically explained by immaturity of adolescent brains and susceptibility to peer influence (e.g., Court, 2013). With the progressing time, students show increasing ability to delay gratification (e.g., Peetsma, Schuitema, & van der Veen, 2012). However, literature on aging population in this respect tends to be rather sparse.

A considerable body of research has been also devoted to reminiscing – positive or negative personal recollections of the past and the various roles, which both positive and negative memories may have: Wong and Watt (1991) pointed out the changing impact memories may have on successful aging. Not only objective personal history but also sub-

jective cognitive styles play an important role. Wong and Watt distinguished, on one hand, the maladaptive obsessive and escapist reminiscence and, on the other hand, the integrative, instrumental, transmissive, and narrative functions of memories (cf. Hofer et al., 2017). With respect to reminiscing, theoretically interesting and practically useful is research devoted to the gradual loss of memory and its affective aspects: The ‘fading affect bias’ (FAB) phenomenon (Ritchie et al., 2015; Walker, Skowronski, & Thompson, 2003) reveals that unpleasant or ambivalent autobiographic emotions fade faster than the pleasant ones (as has been traditionally witnessed by women who gave birth and men who served in the military).

Rich literature has been devoted to TP as an indicator of adaptation or lack thereof: The Future TP always has a positive connotation and tends to be linked to adaptive behavior, health oriented behavior, and alleviation of depression and other symptoms of aging (i.a., Carvalho, 2015; Hamilton et al., 2015; Kahana et al., 2005). In contrast, present fatalism is typically referred to as an indicator of maladaptation. Boyd and Zimbardo (2005) reported that high Present Fatalistic scores of ZTPI correlate with aggression, depression, anxiety, and decreased conscientiousness; however, their data primarily refer to college students. Fatalism data of older respondents are less readily available since existing research mostly focuses on participants selected for various clinical and epidemiological studies and seldom involves general older populations. Available studies generally confirm a strong relationship between present fatalism and various undesirable clinical indicators, i.a., noncompliance with health care recommendations, with oncological screening, etc. (Davis & Srivastava, 2003; Mayo, Ureda, & Parker, 2001).

Recent literature indicates that not just individual TP dimensions but also their con-

stellations and balance should be taken into account. Thus, Boniwell and Zimbardo (2004) pioneered in empirical estimates of the time perspective balance.

The purpose of this paper was not only to analyze the developmental course of various aspects of time apperception (i.e., the significance of the past, present and future time) across the whole course of life in a national sample but also to test whether the developmental changes are the effect of time or other variables as well. We also meant to go beyond the abstract and impersonal TP dimensions and via class analysis capture *constellations of TPs in real existing people*. To our knowledge, nobody has analyzed development of time perspective in such complexity.

Current Study

Aims of the Study

After initial confirmation of the dimensionality of the ZTPI inventory and, thus, verification of suitability of this method for complex assessments, we focused on the following aims:

- a) to ascertain the role of age across the TP dimensions;
- b) to identify prevalent TP patterns using latent class analysis – LCA across the life-span;
- c) to determine which other available variables beyond age (such as education, sex, social and economic factors) may be involved in developmental differences of TP dimensions and patterns (using multivariate linear regressions – LR).

Method

Procedure

The Zimbardo Time Perspective Inventory (ZTPI) was used as the assessment instrument since it is the most prominent among the TP

techniques. Despite some, mainly psychometric controversy (e.g., McKay et al., 2019; Temple, Perry, & Worrell, 2019), it has shown favorable psychometric properties in its original long version with 56 items (Zimbardo & Boyd, 1999; Lukavska et al., 2011) as well as in its abbreviated forms (Kostal et al., 2016). ZTPI has been repeatedly used on the Czech population; Kostal et al. (2016) demonstrated that ZTPI-short has favorable psychometric properties and its 15 items (three items per each ZTPI dimension) manifested high reliability when compared to the original unabridged ZTPI instrument.

Participants

ZTPI was administered during face to face interviews in its original form in two waves to samples aged 15 to 89, mean age 43.95, SD 17.31, ($N_{2003} = 1,049$) and 15-84 years ($N_{2008} = 1,152$), courtesy of the Public Opinion Research Centre of the Institute of Sociology, Czech Academy of Sciences (Centrum pro výzkum veřejného mínění, CVVM). The quota samples did not overlap and they proportionally represent the adult population of the Czech Republic with respect to sex, age groups, education level, size of town/city, and region.

Measures

The ZTPI method in its full extent consists of 56 items, responses are registered on a five-point Likert scale. This ZTPI encompasses five dimensions:

Positive Past is assessed by nine items, e.g., by statements such as “It gives me pleasure to think about my past” and “I get nostalgic about my childhood.”

Negative Past contains ten items as: “I think about the bad things that have happened to me in the past” and “It’s hard for me to forget unpleasant images of my youth.”

Hedonistic Present consists of fifteen items, e.g., "I take risks to put excitement in my life" and "Taking risks keeps my life from becoming boring."

Fatalistic Present is assessed by nine items, "It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway" or "Since whatever will be will be, it doesn't really matter what I do," among others.

Future dimension is measured by thirteen items, such as "I complete projects on time by making steady progress" and "I meet my obligations to friends and authorities on time."

Besides providing demographic information, participants also responded to supplementary questions on their education, employment, size of their community and region, life satisfaction, standard of living, religion, living with a partner and dependent children, satisfaction with current politics, trust of political representation (local representatives, Parliament, Senate, the Cabinet and the President), political orientation on the left-right political scale, and finally, likelihood of voting and their party preferences.

Data Analysis

The core of our study has four distinct steps:

1) Bivariate analyses were performed to test relationships between respondents' ages and individual ZTPI dimensions;

2) Multivariate analysis, namely, multiple regressions were used to reveal significance of respective variables (age, demographics, educational and economic factors, social adaptation indices, political attitudes, etc.) for all five parceled ZTPI dimensions;

3) Latent class analysis (LCA) was employed to determine latent subpopulations that exhibit a similar pattern of responses to the ZTPI battery;

4) Multiple regressions were used to reveal the significance of respective variables (age, demographics, educational and economic

factors, social adaptation indices, political attitudes, etc.) for probabilities of belonging to respective time perspective patterns.

Results

Before progressing to the main aims of our study, we subjected the ZTPI results to the basic statistical checks – the Cronbach's alpha, the exploratory and confirmatory factor analyses and tests of invariance. The Cronbach alpha ranged from very good results in the scale of Present-Hedonism (.85), Negative-Past (.81), good results in Future (.75) and Present-Fatalism (.73) to minimally acceptable¹ Positive-Past (.65). The ZTPI dataset passed well into cutoffs of goodness of fit coefficients. Exploratory (EFA) and confirmatory (CFA) factor analyses were conducted earlier, separately for the two waves of unabridged inventory (Lukavska et al., 2011) as well as for the abridged inventory including pooled dataset of all three waves of ZTPI short administration with $N = 3,083$ of adults aged 18+ (Kostal et al., 2016). In all cases, the results generally corresponded to the five-factor ZTPI theory. Invariance of the 5F ZTPI model across several waves and of the whole survey was confirmed for the short version only. We tested both full-version administrations separately with satisfactory results using MPlus, WLSMV estimator as well as SPSS AMOS.²

1 The Encyclopedia of Biostatistics (Dukes, 2005) considers values from .70 to .65 as minimally acceptable.

2 Delta CFI for metric against configural as well as for scalar against configural model was between .001 and .003 fitting the expected value under .01 (Ariely & Davidov, 2011); delta RMSEA was between .001 and .002, thus fitting the expected value under .015 (Zercher et al., 2015); AMOS delta 2 (IFI) versus configural model lied between .001 and .003 with significance above .001 (.025-.549) (Arbuckle, 2008). RMSEA, CFI, TLI and baseline CHI-square for configural, metric and scalar 5F model also fit conventional thresholds such as CFI/TLI > .930 or RMSEA < .08 (Hu & Bentler, 1999; Byrne, 2012).

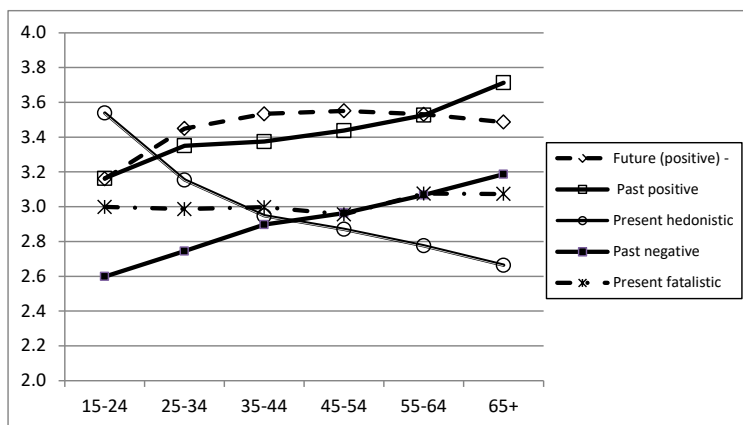


Figure 1 ZTPI dimensions (assessed by 1 to 5 Likert scales) and age broken down by decades.

Table 1 Average scores in ZTPI dimensions for respective age categories (N = 2,210). Indices denote rank-order by which age groups differ from one another

Age groups	15-24	25-34	35-44	45-54	55-64	65+	Total	Eta	R	F	Sig.
Present-Hedonism	3.54 ⁵	3.15 ⁴	2.95	2.87 ³	2.78 ²	2.66 ¹	3.00	.423	-.400	93.404	.000
Future	3.16 ¹	3.45 ²	3.53 ²	3.55 ²	3.53 ²	3.49 ²	3.45	.258	.180	30.487	.000
Positive-Past	3.16 ¹	3.35 ²	3.37 ³	3.44	3.53	3.71 ⁴	3.42	.241	.233	26.888	.000
Negative-Past	2.6 ¹	2.74 ²	2.9 ³	2.96 ⁴	3.07 ⁵	3.19	2.90	.278	.276	35.334	.000
Present-Fatalism	3.00	2.99	3.00	2.96	3.08	3.07	3.01	.090	.057	3.527	.004

Bivariate Analyses

Initial bivariate analyses suggested that all ZTPI scales tend to be age-sensitive (Cramer’s V > .200, sig. < .01) and in the expected directions. Figure 1 illustrates this relationship broken down by decades, which are plotted to highlight the developmental tendencies. Table 1 then shows statistical significance of age differences within each ZTPI dimension.

Multilinear Regressions

The bivariate relationships were further tested by MLR, see Table 2.³ The results indicate the following:

³ The multiple R values (the coefficient of correlation with multiple regressors) range from .061 to .193 for respective ZTPI scales. Within social studies, these are considered moderate to large.

Present Hedonism is the most age-dependent from all TP dimensions (for age as a continuous variable: Pearson $r = -.402$, sig < .001; for age categorized by decades: sig. $F < .001$, Eta = .423). MLR indicated additional significant predictors: low education, male gender, and contentment with current politics.

Overall, positive memories were stronger than negative ones ($M = 3.42 > 2.90$, Cohen’s $d = .626$). Positive-Past memories scored high and continuously increased with age (Eta = .241; $p < .001$; Tukey b post-hoc tests $p = .05$; $r = .233$); additional significant predictors identified by MLR included female gender, retirement, having a partner or being divorced, lower income, and sympathies to the Communist Party. *Negative-Past* had overall lower intensity, yet a similar incline ($r = .276$,

Table 2 *Multiple linear regression: Significant predictor (standardized) Beta values for multiple linear regression of 56 TP Zimbardo parceled scores for the whole sample (N = 2,201)*

Variable	Parceled indices based on Czech EFA-Zimbardo PCA				
	Negative-Past	Positive-Past	Present Hedonism	Present Fatalism	Future
Age of respondent (15...89)	.093**	.128***	-.274***		.140***
Gender (1 = male, 2 = female)		.130***	-.066**	.056*	.073**
Net monthly HH income-intervals (13), imputed	-.061**			-.062*	
HH income approximately CZk 22 750		.058**			
HH income approximately CZk 27 750			-.053*		
Education (1 = primary...6 = university, college)	-.051*		-.053***		.100***
University graduate (= 1, other = 0)				-.047*	
Single, never married (single = 2, others = 1)			.064*		-.123***
Marital status (2 = divorced, 1 = other)		.115***			
Partner		.071**			
Economic activity (salary/wage 1 = no, 2 = yes)					.118***
Occupation (2 = managers, higher professionals, 1 = other)					.053*
Student, apprentice (= 2, others = 1)	-.055*				
Retired, pensioned (= 1, others = 0)		.083**		.067**	
Unemployment (unemployed = 2, other = 1)	.041*			.075**	
HH size dichotomized		.052*			
Size of town up to 5000 inhabitants (= 2, other = 1)					.078***
Size of town up to 15000 inhabitants (= 2, other = 1)				-.065**	
Size of town up to 50000 inhabitants (= 2, other = 1)	.042*		-.045*		
Czech geography (1 = Moravia, 2 = Bohemia)				-.051*	
Regions dichotomized (2 = capital Prague + Central Bohemia, 1 = other)		-.066**			-.050*

Table 2 continues

Variable	Parceled indices based on Czech EFA-Zimbardo PCA				
	Negative-Past	Positive-Past	Present Hedonism	Present Fatalism	Future
Health - subjective evaluation (1 = bad...5 = good)	-.139***		.059*		
HH standard of living (very 1 = bad...5 = good)	-.065*				.079**
Overall life satisfaction (very 1 = dissatisfied...5 = satisfied)	-.174***			-.064**	
Confession: Roman Catholics (= 2, other = 1)				.065**	
Left political orientation vs. other			-.051*		
Preferences for Social Democratic party (= 1, other = 0)	.045*				.056*
Preferred civic democratic political party ODS (= 1, other = 0)					.072**
Preferred Christian political party KDU ČSL (= 1, other = 0)	.040*				
Preferred Communist political party KSČM (= 1, other = 0)		.063**			.059*
No party preference (= 1, other = 0)			.046*		
Trust in your regional representatives (definitely 1 = no...4 = yes), imputed	.062*	.069**			
Satisfaction with current politics (1 = very dissatisfied...5 = very satisfied)			.107***		
Participation in parliament elections (definitely 1 = no...4 = yes)				-.094***	
Trust in your regional representatives (definitely 1 = no...4 = yes) imputed					.080**
Trust in your local representatives, dichotomized (1 = no, 2 = yes), imputed	-.053*		-.070**		
Satisfaction with physicians' care, dichotomized		.054**			
<i>p</i> value for the predictors significance (<i>t</i> -test)	<.001 -.039	<.001 -.009	<.001 -.039	<.001 -.041	<.001 -.017

Table 2 continues

Table 2 continued

Variable	Parceled indices based on Czech EFA-Zimbardo PCA				
	Negative-Past	Positive-Past	Present Hedonism	Present Fatalism	Future
<i>N</i> /missing	2090/111	2128/73	1907/294	1921/280	1907/294
(-2) Log Likelihood	-1936.305	-2016.669	-1683.788	-1287.982	-1296.035
H0 Scaling Correction Factor for MLR	1.0312	1.0193	1.0435	1.0266	1.0137
Akaike (AIC)	3902.61	4059.338	3393.577	2599.964	2622.069
Bayesian (BIC)	3987.284	4132.956	3465.769	2666.691	2705.369
Sample-Size Adjusted BIC	3939.627	4091.654	3424.468	2628.567	2657.714
<i>R</i> square	.187	.115	.193	.061	.149

Note. Each regression equation as a whole tested by ANOVA (sig. $F < .001$).

* $p \leq .05$; ** $p < .01$; *** $p < .001$; *Mplus v. 7.3*, estimator MLR.

$p < .001$; sig. $F < .001$ and Eta = .278); additional significant predictors identified by MLR included ill-health and overall dissatisfaction with life.

For Future dimension (in ZTPI defined mostly in terms of responsible planning), bivariate analysis showed a significant effect of higher age ($r = .146$ sig $< .001$; sig. $F < .001$, Eta = .208). Additionally, MLR identified such predictors as higher education, salaried employment, life with a partner, female gender and lack of political alienation.

For Present Fatalism, bivariate analysis suggests that the effect of age is significant but very mild (sig. $F = .004$, Eta = .090; $r = .057$, sig = .003). However, MLR scrutiny dismissed age as significant for Present Fatalism and pointed out other significant predictors: lower education, female gender, economic inactivity (retirement or unemployment), political passivity (non-participation in parliamentary elections), religiousness (Catholic), and overall life dissatisfaction.

Latent Class Analysis

Latent class analysis (LCA) of time perspective was carried out for the whole sample

($N = 2,201$) in order to identify naturally occurring patterns of TP or "time attitude profiles" (cf. Andretta, Worrell, & Mello, 2014). *Mplus* version 7.3 for the LCA was used with both Vuong-Lo-Mendell-Rubin LR and Lo-Mendell-Rubin adjusted LRT tests to determine the number of classes. Our aim was not only to ascertain the significance of age but also to identify the effects of other independent variables that might be relevant to time perspective classes.

A four-class LCA solution was statistically most suitable and also stable across various subsamples under analysis. The four classes solution covered the lowest information criteria (AIC and BIC between 323952 and 329072), entropy of .931 and very high average probability of membership (.952 to .968). The four LCA solutions, calculated individually for each wave, also attained the highest stability over 2003 and 2008 (confusion index, CI, between .087 and .097 for interactions with the total fused sample).

Based on the LCA class profiles, depicted in Figure 2, we labeled the classes as Positively Inclined Moderate, Hedonic, Active Ascetic, and Negative Fatalistic. Their further characterizations are presented below.

Class Characterizations using Multiple Regressions

The four classes resulting from LCA were defined by their ZTPI profiles (Figure 2) and further characterized using results of multiple linear regressions, presented in Table 3.

Hedonic class (16% of respondents) stands out by very high Present-Hedonism; additionally, its Negative Past is very low and Future low. This class best represents the youngest respondents (50% of them are 24 y/o or younger), more often men than women, prevalently single, typically with only primary education (partly due to their young age, almost one third of them are still studying). They are very secular – 8 of 10 are without confession. Representatives of this class tend to be more content than representatives of other classes:

they are most satisfied with their life (23% claim they are *very satisfied*, that is more than four times more than reported by the Moderate class); the Hedonic respondents also tend to be satisfied with current politics (20% claim to be *mostly satisfied* and additional 2% *very satisfied*), twice as much as other classes.

Empowered—Active Ascetic profile (about 25% of respondents). This future oriented class is distinct by resolute rejection of Present Hedonism, absence of helpless ideology of Present-Fatalism, and little dwelling in Negative Past. These respondents tend to enjoy better standard of living than other classes, they are better educated, better paid, often with managerial and professional positions (hardly ever stay at home home-makers). They tend to live in larger cities, overwhelmingly married with children but their household tends to be smaller, they are less likely

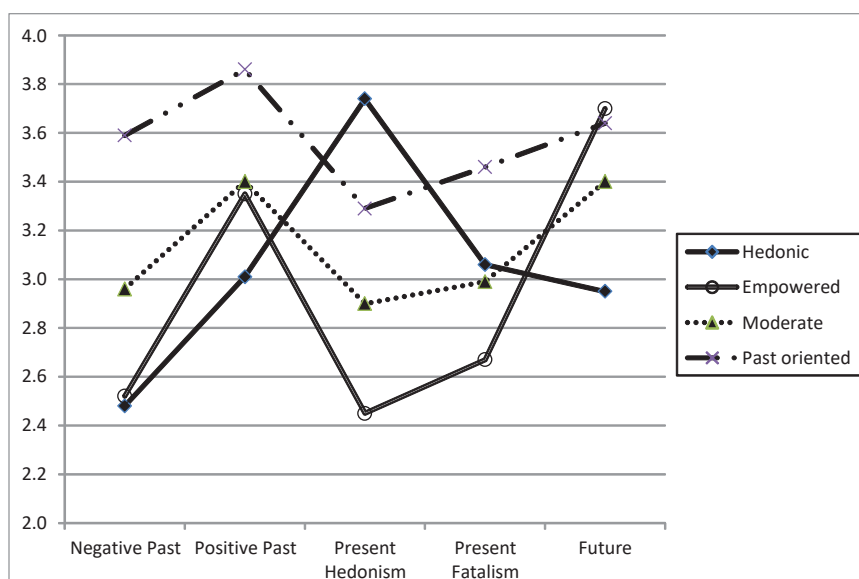


Figure 2 Latent Class Analysis (LCA), four class profiles of the whole sample, characterization by parceled ZTPI (mean) scores of five TP dimensions.

Note. Lines were used instead of histograms so that class differences stand out more illustratively.

than other classes to be of Roman Catholic confession. While the empowered tend to be satisfied with their household standard of living, they tend to be critical of the current politics and also politically active, likely voters in parliamentary elections.

The largest proportion of respondents (over 40%) can be characterized by the *Moderate* class. Their profile is defined by centrist tendencies on all ZTPI scales. This

class is typically made up of people of middle age, married, with children, they tend to be employed and live in smaller cities. Their household income is slightly below-average and self-reported standard of living low, yet they apparently do not succumb to vote for the populist Communist party. They tend to have health complaints, be religious, trust their local representatives rather than the distant Parliament.

Table 3 *Multiple linear regression, significant predictors of belonging to LCA classes. The latent classes were produced across 56 ZTPI items for the whole sample (N = 2,201); the standardized Beta values indicate the probability of belonging to the LCA classes*

Variable	Probability of ZTPI Latent Class membership			
	Hedonist	Empowered	Moderate	Past Oriented
Gender (1 = male, 2 = female)	-.058**			.058**
Age of respondent (15...89)	-.208***	.100**		.071**
HH net monthly income (CzK) imputed (CzK 1 = up to 7 000...13 = 40 001+)				-.051*
HH income approximately CZk 4 000			-.059**	
HH income approximately CZk 22 750		-.049*		
Education (1 = incomplete primary ... 8 = university bachelor)	-.064**	.082**		
University graduate (= 1, other = 0)				-.060**
Single, never married (single = 2, others = 1)	.109**			
Occupation office, non-manual worker	-.052*		.051*	
Student, apprentice (= 2, others = 1)	.116**		-.060**	
Size of town (1 – 2000...6 ≥ 100 000 8 = capital Prague)	.057**	.077**	-.098***	.051*
Regions dichotomized (1 = other, 2 = Prague + Central Bohemia)				-.058**
Subjective evaluation of own health (very 1 = bad...5 = good)		.066*	-.068**	

Table 3 continues

Table 3 continued

Variable	Probability of ZTPI Latent Class membership			
	Hedonist	Empowered	Moderate	Past Oriented
HH standard of living (very 1 = bad...5 = good)		.113***	-.094***	
Overall life satisfaction (1 = very dissatisfied...5 = satisfied)	.067**			-.102***
Non-confessionals (1 = no, 2 = yes)	.042*			
Preferred political party - Communists			-.081***	.064*
No party preference (= 1, other = 0)			-.060**	
Satisfaction with current politics (very 1 = dissatisfied...5 = satisfied)	.071**	-.089***		
Trust in your local representatives dichotomized (1 = no, 2 = yes), imputed	-.058*			-.065*
Trust in the parliament dichotomized (1 = no, 2 = yes)			-.073**	.057*
Trust in your regional representatives (definitely 1 = no...4 = yes), imputed			.054*	
Trust in the president (definitely 1 = no...4 = yes)				.083**
Participation in the parliament elections (definitely 1 = no...4 = yes)		.069**		
Czech Health care services last year dichotomized (1 = dissatisfied, 2 = satisfied)			-.046*	
<i>p</i> value for predictors significance (<i>t</i> -test)	<.001 -.039	<.001 -.017	<.001 -.017	<.001 -.028
<i>N</i> /missing	1774/426	1756/444	2010/190	2039/162
(-2) Log Likelihood	-421.068	-859.524	-1272.843	-911.905
H0 Scaling Correction Factor for MLR	1.215	.9345	.8918	1.0844
Akaike (AIC)	868.135	1739.048	2571.686	1851.81
Bayesian (BIC)	939.388	1793.756	2644.562	1930.493
Sample-Size Adjusted BIC	898.088	1761.987	2603.26	1886.014
<i>R</i> square	.204	.055	.058	.058

Note. Each regression equation as a whole tested by ANOVA (sig. $F < .001$)

The Past Oriented class (almost 19%) stands out by the most intense orientation to the by-gone days. Both Positive- and Negative-Past are more significant for them than for any other class. Additionally, they score the highest on the dimension of Present-Fatalism. Demographic data show that the membership in this group increases with age, its members are more often retired, disabled or widowed. They also tend to be less educated, with sympathies either for religion (Roman Catholicism) or for populist politics (Communist Party). These respondents are the most dissatisfied with life from all the classes, likely to complain about their health, standard of living, dissatisfaction with current politics; with mixed political loyalties, they tend to respect the President.

Time Perspective Patterns Across the Life Span

In each LCA class (Hedonic, Empowered, Moderate, and Past Oriented), at least one age category is represented more frequently than might be expected by mere chance. These overrepresentations (and under-representations) indicate that the TP undergoes a life span development. Although this assumption is based on age cohorts and not a longitudinal study, the interpretation of differences makes a good logical sense – see Table 4.

The members of the *Hedonic class* particularly stand out since almost three quarters of them are 34 y/o or younger (Pearson r for probability of membership with continuous age = $-.377$). The remaining classes are linked to age less closely but still significantly (Pearson r between $.091$ and $.122$, two-tailed sig. $< .001$). *The Empowered* class is most characteristic of mid-age adulthood, the most productive years of 35-44 y/o ($p < .01^{**}$). *The Moderate* class is typical for mature ($p < .01^{**}$) and older adulthood ($p < .05^*$). However, here it is important to stress that this age related finding may only be an artifact, since the effect of age in this case was not confirmed by multivariate analysis: Interestingly, as Table 3 revealed, 'Moderateness' is *not* a result of age; rather than a result of the life cycle, it seems to be the result of life-style, poor health, and scarce resources (Moderates tend to live in a small city, with low standard of living, declining health...). The center of gravity of the *Past Oriented* class lies in the senior period of 65+ years.

Discussion

TP as a Complex Phenomenon

Time apperception is a complex phenomenon and, thus, diverse approaches and complex data analyses were used to assess its patterns

Table 4 Prevalence of age groups within time perspective patterns (LCA classes)

LCA classes	Age groups						Total
	15-24	25-34	35-44	45-54	55-64	65+	
Hedonic	50.0%***	23.3%**	10.8%	7.0%	5.8%	3.2%	16.6%
Empowered	9.5%	16.0%	20.5%**	19.5%	18.9%*	15.5%	24.6%
Moderate	9.2%	19.3%	16.9%	20.1%**	20.8%*	13.7%	40.6%
Past Oriented	13.9%	12.7%	15.7%	16.8%	22.5%*	18.4%***	18.7%
<i>N</i>	364	389	364	377	401	295	2,190

Note. Cramer's $V = .248$ ($p < .001$), sign test (***) $p < .001$, ** $p < .01$, * $p < .05$)

and predictors. Well-established ZTPI method, a large population sample, and rigorous data analysis was used to assess the development of TP across the life span. The results are presented with an increasing complexity, from bivariate analyses to multivariate techniques. All analyses concur that most ZTPI scales are age-sensitive.

TP is an orientation developing in time yet it is easy to falsely exaggerate the effect of age if only bivariate analyses are taken into account. Thus, multivariate techniques were employed and linear regression revealed significant predictors in operation besides age, which affect the changing meaning of the past, presence, and future; they are subjective health, education, living with a partner, employment/retirement, standard of living, political orientations, and religiousness. Notably, these predictors also tend to be age-dependent, that is why the age factor appeared strongly in bivariate analyses in the first place; still, many of these predictors are more significant than the age per se.

Four Life Philosophies

Our empirically derived typology of four main TP patterns illustrates four developmental phases and at the same time reflects four philosophies of life:

a) The Hedonic profile, prominent in youth, represents self-centered enjoyment.

b) The Empowered profile tends to build up with maturation and culminates in mid-age adulthood, when people tend to be in their prime at work and fully engaged in their families.

c) The Moderate profile stands for the most common "middle of the road" conforming philosophy, a safe strategy, which takes over when temporary urges to enjoy oneself (Hedonism) or to self-actualize (Empowerment) weaken. That is why it seems to have two cul-

mination points, one weaker around the age of 20 and the other more distinct around the age of 60.

d) Finally, the Past Oriented strategy defines an escape to the past, either to linger in pleasant memories or blame the fate for depriving one of a better lot.

The young appear as having little choice: most of them (particularly males) tend to be Hedonic. With the progress to adulthood, likelihood to profess other TP patterns tends to be more equal. With the onset of aging, the Empowered pattern tends to yield to the Moderate and finally to the Past Oriented pattern. At that phase, the Hedonic pattern becomes very unusual.

Still, even at the advanced age, there is a considerable diversity of TP patterns and styles of coping. TP is an individualized process even though our study points out general trends (e.g., the general decline of hedonism with age and an increase of both reminiscence and nostalgia in the senior category). It is useful to be aware of variables and circumstances (especially health, education, partnership, and general life satisfaction), which influence the freedom of choice among life trajectories. This is in concord with current trends in which "the standardized life cycle has been replaced by an individualized life course, characterized by the absence of a strict sequence and timing of life's transitions" (Elchardus & Smits, 2006; p. 303).

Adaptive and Maladaptive TP

It is possible to distinguish between more and less mature and practical ZTPI profiles; the distinction is corroborated by studies of mental and physical health (cf. Zimbardo & Boyd, 1999; Fieulaine & Martinez, 2012). More desirable profiles score high on Future, Positive-Positive, and to some degree also on Present-Hedonism scales, they are

low on Negative-Past and Present-Fatalism scales. Our results are in concord with findings of Zimbardo and Boyd (1999) and their conclusion that people with this 'positive profile' tend to be satisfied with life, seem to be healthier, living with a partner, they tend to acquire higher education and achieve a better standard of living. Among others, Wiesmann, Ballas, and Hannich (2018) report that lack of concentration on Negative Past along with high Future orientation predict a satisfactory notion of coherence and thus successful aging. Similarly, Zambianchi and Bitti (2014) attest that Future and Positive-Past orientations are good dispositions for proactive coping and social well-being, while the present oriented time perspective (Present-Hedonism and Present-Fatalism) tends to affect coping strategies negatively. For example, Fatalism may become a cause for a fatalistic withdrawal from life as described by Hayes et al. (2016).

Among our four LCA patterns, two represent less adaptive methods of coping (the Hedonist class is largely immaturely self-centered and the Past Oriented class represents prevalently fatalistic escapism). The other two patterns (Empowered and Moderate) are active coping styles. Our study confirms the significance of social support (living with a partner and working environment), of well-being both in material and social sense, the role of education and civic conscience.

Some of the negativity may be explained by aging, some may reflect a possible effect of *post-totalitarian legacy*. The survey was carried out in the Czech Republic and we may only guess to what degree some of our findings reflect the bleak past of the Communist and Nazi totalitarianisms. Nazi and Communist dictatorships of the 20th century were objective debilitating facts, which may have accented some of the negativism (Past-Negative and Present-Fatalism) of older respondents whose lives and careers suffered by authoritarian policies. In

fact, it would be surprising if the Iron Curtain and suppression of human rights and freedoms of adult participants had not contributed to higher scores in items which refer to "abuse and rejection in the past" and "things that I have missed out on in my life." Observation of relationship between political experience and TP is rare – e.g., note discussion of differences among TP clusters in Brits and Russians by Boniwell et al. (2010, p. 35 and p. 36).

At the same time, negativistic passivity could also be enhanced by the "foul mood" of those, who did not appreciate the democratic revolution. After all, we noticed that respondents best characterized by the escapist Past Oriented TP pattern (with the highest level of Fatalism and both negative and positive reminiscence), are also frequently (almost 19%, double of the national average) voters of the Communist Party, which was responsible for the Communist dictatorship. In any case, the effect of historical experience and culture on TP has been long known (i.a., Shannon, 1975; Boniwell et al., 2010; Sircova et al., 2015) as well as such phenomena as learned helplessness (Seligman, 1972), post-communist syndrome (Klicperová et al., 1997), or East-European Ostalgie (Berdahl, 1999).

Even if negativism and fatalism may have been somewhat elevated in the Czech respondents as a result of the totalitarian heritage in Central Europe, this still should not diminish the general trends in our findings. Increased levels of fatalism in aging populations may be universal and attributable to the withdrawal from the economic process, declining health, and loneliness of widowhood.

Methodological Constraints

Although this assumption is based on age cohorts and not on a longitudinal study, the interpretation of differences makes a good logical sense – see Table 4.

Certain limitations arise both from the methods and sample used. ZTPI is a concise method and as we mentioned above, not without controversies of mostly psychometric nature. One might also dispute the substance of the scales. The Future dimension in ZTPI, for example, mostly refers to appointments and planning, it does not entail the finer qualitative and existential aspects of the future; some important temporal aspects were probably missed. Our study is cross-sectional rather than longitudinal, rigorous observation of the same people over time would bring more valid results. Although sampling of our participants respected the demographic composition of the country with respect to sex, age, education, size of town/city and regions, the sample was drawn by the quota method, which always implies a risk of non-sampling errors. Still, a population sample of this size has advantages in comparison to convenience samples of university students, a usual practice in this field of study.

The question of *missings* emerged with statistical analyses of both individual and parceled ZTPI indices. Fifty-six items of the ZTPI inventory makes for a lengthy questionnaire, especially when incorporated into a longer Omnibus battery. Only 70% of the respondents answered all 56 questions, whereas 25% of the others dropped just 1-5 items (0.2% avoided more than 28 items). Little's Chi-square tests confirmed non-random character of the missing values (Chi-Square = 24,076.699, $DF = 22,606$, Sig. < .001.) However, exclusion of cases with incomplete data would significantly alter the outcome. We confirmed this by systematic probes in which we calculated the Past Positive ZTPI factor parceled data based on dummy variable missing/not missing, and it turned out that some social groups became underrepresented (mostly students & apprentices 15-19 y/o, residing in Prague and in Central Moravia). Excluded

people do not only change the demographic structure but also the data on TP and relevant attitudes. We faced this deficiency for LCA and for CFA by FIML analysis method, thus not excluding respondents even if they provided on average as few as 82-83% ZTPI answers.⁴

Further Research

TP demands an ever-growing complexity. We attempted to respect this trend in our study, progressing from individual dimensions to exploration of constellations of ZTPI scales, time orientation patterns, and multivariate analyses of intervening variables. A substantial amount of variance still remains to be explained, though, and thus there is space for involvement of further relevant variables, especially personality and situational factors. With respect to application, better understanding of TP patterns may help to foster optimal development and adaptation to aging, better control of negativity and fatalism.

Practical Applications

The time perspective approach provides a practical tool for assessment as well as for counseling and educational or clinical guidance. Boniwell and Zimbardo (2004) demonstrated the usefulness of focus on the constellations rather than single TP dimensions. Zimbardo, Sword, and Sword (2012) showed possibilities to overcome the post-traumatic

⁴ When we collated several ZTPI items together to create parceled indices a new problem of MCAR re-emerged. The ZTPI parceled dimension contained 8-14 items each. Depending on patterns of missingness, we included only respondents who scored mostly in a valid way, dropping thus between 0.7-3.6% per each dimension. Some Little's MCAR tests were confirmed, for instance for Negative-Past and Present-Hedonistic ZTPI (Chi-Square = .255, $df = 2$, Sig. = .880). The dummy variable analysis of missing/not missing confirmed the presence of at least MAR (missings at random) for all other ZTPI parceled indices.

stress disorder when they fostered shifts from the past to the present and future TP. We believe that our approach of time patterns as well as identification of significant predictors may lead to yet another approach of assessment and therapy which uses TP (e.g., Weissenberger et al., 2016; Ptacek et al., 2019).

Conclusion

The study demonstrated on a cross-sectional sample that time perspective, a complex temporal apperception, develops in time but is not influenced just by age and maturation but also by other variables. These are, among others, education, employment, living with a partner, political maturity, or subjective health. These variables are significant not only for individual ZTPI dimensions but also for complex TP constellations.

Latent Class Analysis produced meaningful TP patterns with logical demographic and attitudinal correlates (Hedonic, Empowered, Moderate, and Past Oriented classes). These patterns also correspond to various life philosophies and to successive developmental phases of human life: exploration and enjoyment of life in the young age; focus on one's career and responsibilities to others in the early adulthood; and coping with increasing age either a) by determined continuation of the empowered lifestyle, b) by cautious moderation or, c) by a fatalistic withdrawal to the past. Better knowledge of intervening variables and predictors may provide leads for fostering adaptive TP and positive aging strategies.

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References

- Andretta, J. R., Worrell, F. C., & Mello, Z. R. (2014). Predicting educational outcomes and psychological well-being in adolescents using time attitude profiles. *Psychology in the Schools, 51*, 434–451. <https://doi.org/10.1002/pits.21762>
- Arbuckle, J. A. (2009). *Amos 18 User's Guide*. Chicago.
- Ariely, G., & Davidov, E. (2012). Assessment of measurement equivalence with cross-national and longitudinal surveys in political science. *European Political Science, 11*, 363–377. <https://doi.org/10.1057/eps.2011.11>
- Berdahl, D. (1999). '(N)Ostalgie' for the present: Memory, longing, and East German things. *Ethnos, 64*(2), 192–211. <https://doi.org/10.1080/00141844.1999.9981598>
- Boniwell, I., & Zimbardo, P. G. (2004). Balancing time perspective in pursuit of optimal functioning. In P. A. Linley, & S. Joseph (Eds.), *Positive Psychology in Practice* (pp. 165–180). Hoboken, New Jersey. John Wiley & Sons.
- Boniwell, I., Osin, E., Linley, A., & Ivanchenko, G. V. (2010). A question of balance: Time perspective

- and well-being in British and Russian samples. *The Journal of Positive Psychology*, 5, 24–40. <https://doi.org/10.1080/17439760903271181>
- Boyd, J. N., & Zimbardo, P. G. (2005). Time perspective, health, and risk taking. In A. Strathman, & J. Joireman (Eds.), *Understanding behavior in the context of time. Theory, research, and application* (pp. 85–108). Mahwah, NJ.: Lawrence Erlbaum Associates, Inc.
- Byrne, B. M. (2012). *Structural equation modeling with Mplus. Basic concepts, applications, and programming*. New York: Routledge, Taylor & Francis Group.
- Carvalho, R. G. G. (2015). Future time perspective as a predictor of adolescents' adaptive behavior in school. *School Psychology International*, 36, 482–497. <https://doi.org/10.1177/0143034315601167>
- Court, J. M. (2013). Immature brain in adolescence. *Journal of Paediatrics & Child Health*, 49, 883–886. <https://doi.org/10.1111/jpc.12241>
- Davis, M. P., & Srivastava, M. (2003). Demographics, assessment and management of pain in the elderly. *Drugs & Aging*, 20, 23–57. <https://doi.org/10.2165/00002512-200320010-00003>
- Dukes, K. A. (2005). *Encyclopedia of biostatistics*. Wiley Online Library.
- Elchardus, M., & Smits, W. (2006). The persistence of the standardized life cycle. *Time & Society*, 15, 303–326. <https://doi.org/10.1177/0961463X06066944>
- Fieulaine, N., & Martinez, F. (2012). Induced temporal context and health communication: From temporal perspective to temporal horizon. *Psychology & Health*, 27, S1, Suppl. 1, 43–44.
- Hamilton, J. L., Connolly, S. L., Liu, R. T., et al. (2015). It gets better: Future orientation buffers the development of hopelessness and depressive symptoms following emotional victimization during early adolescence. *Journal of Abnormal Child Psychology*, 43, 465–474. <https://doi.org/10.1007/s10802-014-9913-6>
- Hayes, J., Ward, C. L. P., & McGregor, I. (2015). Why bother? Death, failure, and fatalistic withdrawal from life. *Journal of Personality and Social Psychology*, 110, 96–115. <https://doi.org/10.1037/pspp0000039>
- Hofer, J., Busch, H., Poláčková Šolcová, I., & Tavel, P. (2017). When reminiscence is harmful: The relationship between self-negative reminiscence functions, need satisfaction, and depressive symptoms among elderly people from Cameroon, the Czech Republic, and Germany. *Journal of Happiness Studies*, 18(2), 389–407. <https://doi.org/10.1007/s10902-016-9731-3>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55. <https://doi.org/10.1080/10705519909540118>
- Kahana, E., Kahana, B., & Zhang, J. (2005). *Motivation and Emotion*, 29, 443–464. <https://doi.org/10.1007/s11031-006-9012-2>
- Klicperová, M., Feierabend, I., & Hofstetter, C. R. (1997). In the search for a Post-Communist Syndrome: A theoretical framework and empirical assessment. *Journal of Community & Applied Social Psychology*, 7, 39–52. [https://doi.org/10.1002/\(SICI\)1099-1298\(199702\)7:1<39::AID-CASP398>3.0.CO;2-1](https://doi.org/10.1002/(SICI)1099-1298(199702)7:1<39::AID-CASP398>3.0.CO;2-1)
- Kostal, J., Klicperova-Baker, M., Lukavska, K., & Lukavsky, J. (2016). Short version of the Zimbardo Time Perspective Inventory (ZTPI-short) with and without the Future-Negative scale, verified on nationally representative samples. *Time and Society*, 25, 169–192. <https://doi.org/10.1177/0961463X15577254>
- Laureiro-Martinez, D., Trujillo, C. A., & Unda, J. (2017). Time perspective and age: A review of age associated differences. *Frontiers in Psychology*, 8, article 101. <https://doi.org/10.3389/fpsyg.2017.00101>
- Lennings, C. J. (2000). Optimism, satisfaction and time perspective in the elderly. *International Journal of Aging and Human Development*, 51, 167–81. <https://doi.org/10.2190/06GK-WHER-37XC-BTRY>
- Lukavská, K., Klicperová-Baker, M., Lukavský, J., & Košťál, J. (2011). Zimbardo ZTPI - Time Perspective Inventory - Czech validation study. *Československá Psychologie*, 55, 356–373.
- Mayo, R. M., Ureda, J., Parker, V. G. (2001). Importance of fatalism in understanding mammography screening in rural elderly women. *Journal of Women and Aging*, 13, 57–72. https://doi.org/10.1300/J074v13n01_05
- McKay, M. T., Worrell, F. C., Zivkovic, U., Temple, E., Mello, Z. R., Musil, B., Cole, J. C., Andretta, J. R., & Perry, J. L. (2019). A balanced time perspective: Is it an exercise in empiricism, and does it relate meaningfully to health and well-being outcomes? *International Journal of Psychology*, 54, 775–785. <https://doi.org/10.1002/ijop.12530>

- Peetsma, T., Schuitema, J., & van der Veen, I. (2012). A longitudinal study on time perspectives: Relations with academic delay of gratification and learning environment. *Japanese Psychological Research*, 54, 241–252. <https://doi.org/10.1111/j.1468-5884.2012.00526.x>
- Ptacek, R., Weissenberger, S., Braaten, E., Klicperova-Baker, M., Goetz, M., Raboch, J., Vnukova, M., Stefano, G. B. (2019). Clinical implications of the perception of time in attention deficit hyperactivity disorder (ADHD): A review. *Medical Science Monitor* 25, pp. 3918–3924. doi: 10.12659/MSM.914225
- Ritchie, T. D., Bateson, T. J., Bohn, A., et al. (2015). A pancultural perspective on the fading affect bias in autobiographical memory. *Memory*, 23, 278–290. <https://doi.org/10.1080/09658211.2014.884138>
- Seligman, M. E. P. (1972). “Learned helplessness”. *Annual Review of Medicine*, 23, 407–412. <https://doi.org/10.1146/annurev.me.23.020172.002203>
- Shannon, L. (1975). Development of time perspective in 3 cultural groups – Cultural difference in an expectancy interpretation. *Developmental Psychology*, 11, 114–115. <https://doi.org/10.1037/h0076120>
- Sircova, A., Mitina, O. V., & Boyd, J., Davydova, I. S., Zimbardo, P. G., Nepryaho, T. L., Nikitina, E. A., Semyonova, N. S., Fieulaine, N., Yasnaya, V. A. (2007). The phenomenon of time perspective across different cultures: Review of researches using ZTPI scale. *Cultural-Historical Psychology*, 3(4), 19–31. doi: [10.17759/chp.2007030403](https://doi.org/10.17759/chp.2007030403)
- Sircova, A., van de Vijver, F. J. R., Osin, E., Milfont, T. L., Fieulaine, N., et al. (2015). Time Perspective Profiles of Cultures. In M. Stolarski, N. Fieulaine, & W. van Beek (Eds.), *Time perspective theory; Review, research and application: Essays in honor of Philip G. Zimbardo* (pp. 169–187). Springer International Publishing. https://doi.org/10.1007/978-3-319-07368-2_11
- Stolarski, M., Fieulaine, N., & van Beek, W. (2015). *Time perspective theory; Review, research and application. Essays in honor of Philip G. Zimbardo*. New York: Springer.
- Temple, E., Perry, J. L., & Worrell, F. C. (2019). The Zimbardo time perspective inventory: Time for a new strategy, not more new shortened versions. *Time and Society*, 28, 1167–1180 <https://doi.org/10.1177/0961463X17718102>
- Walker, W. R., Skowronski, J. J., & Thompson, C. P. (2003). Life is pleasant – and memory helps to keep it that way! *Review of General Psychology*, 7, 203–210. <https://doi.org/10.1037/1089-2680.7.2.203>
- Weissenberger, S., Klicperova-Baker, M., Zimbardo, P., Schonova, K., Akotia, D., Kostal, J., Goetz, M., Raboch, J., & Ptacek, R. (2016). ADHD and Present Hedonism: Time perspective as a potential diagnostic and therapeutic tool. *Neuropsychiatric Disease and Treatment*, 12, 2963-2971 <https://doi.org/10.2147/NDT.S116721>
- Wiesmann, U., Ballas, I., & Hannich, H.-J. (2018). Sense of coherence, time perspective and positive aging. *Journal of Happiness Studies*, 19, 817–839. <https://doi.org/10.1007/s10902-017-9850-5>
- Wong, P. T. P., & Watt, L. M. (1991). What types of reminiscence are associated with successful aging? *Psychology and Aging*, 6, 272–279. <https://doi.org/10.1037/0882-7974.6.2.272>
- Zambianchi, M., & Bitti, P. E. R. (2014). The role of proactive coping strategies, time perspective, perceived efficacy on affect regulation, divergent thinking and family communication in promoting social well-being in emerging adulthood. *Social Indicators Research*, 116, 493–507. <https://doi.org/10.1007/s11205-013-0307-x>
- Zercher, F., Schmidt, P., Ciecuch, J., & Davidov, E. (2015). The comparability of the universalism value over time and across countries in the European Social Survey: Exact vs. approximate measurement invariance. In van de Schoot, R., Schmidt, P., & De Beuckelaer, A. (Eds.), *Frontiers in Psychology. Measurement Invariance. Methods*, 6, 207–217. <https://doi.org/10.3389/fpsyg.2015.00733>
- Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, 77, 1271–1288. <http://dx.doi.org/10.1037/0022-3514.77.6.1271>.
- Zimbardo, P. G., Sword, R., & Sword, R. (2012). *The Time Cure: Overcoming PTSD with the new psychology of time perspective therapy*. San Francisco: Wiley & Sons.