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PART I METHODOLOGICAL ISSUES

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Testing a German Version of the Zimbardo Time Perspective Inventory (ZTPI)

Abstract

The present study assesses the psychometric properties of the Zimbardo Time Perspective Inventory (ZTPI) in a German sample of N = 160 individuals. The five subscales (Past-Negative, Present-Hedonistic, Future, Past-Positive, and Present-Fatalistic) measure different dimensions of the Time Perspective. The German version of the ZTPI proves to be internally consistent and reliable in retests, except for the Future Scale. Retest reliability for a subsample (N = 25) indicates a stable measurement of the scales. The Zimbardo and Boyd's (1999) factor structure could not be replicated satisfactory. Correlations with conceptually related tests (IPC, HAKEMP, and HEIPI) indicate a fair degree of construct validity within the framework of classical test theory. The fit according to a Rasch model was not successful.

Keywords: Zimbardo Time Perspective Inventory (ZTPI), German translation, validation, diagnostic instrument

Testowanie niemieckiej wersji Kwestionariusza Postrzegania Czasu Zimbardo (ZTPI)

Streszczenie

W niniejszym badaniu oceniono psychometryczne właściwości ZTPI na niemieckiej próbie N = 160 osób. Do pomiaru różnych rodzajów perspektywy czasu wykorzystano pięć skal: Przeszłość-Negatywna, Teraźniejszość-Hedonistyczna, Przyszłość, Przeszłość-Pozytywna oraz Teraźniejszość-Fatalistyczna. W oparciu o wyniki badań powtórzonych, za wyjątkiem skali badającej orientację przyszłościową, niemiecka wersja kwestionariusza ZTPI okazała się wewnętrznie spójna i rzetelna. Rzetelność ponownego badania dla podpróby (N = 25) wskazuje na stabilny pomiar skal. Nie udało się w sposób zadowalający replikować struktury czynnikowej opracowanej przez Zimbardo i Boyda (1999). Korelacje z wynikami konceptualnie powiązanych testów (IPC, HAKEMP i HEIPI) pokazują znaczny stopień trafności

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konstruktu w ramach klasycznej teorii testów. Nie powiodło się jednak dopasowanie wyników do modelu Rascha.

Słowa kluczowe: Kwestionariusz Postrzegania Czasu Zimbardo (ZTPI), trafność, niemieckie tłumaczenie, narzędzie diagnostyczne

Introduction

In recent years the conception of "Time Perspectives" (TP) as a general temporal orientation towards past, present, or future has been subject to intensive research. So far, most studies and theories focused on a Future or Present TP (e.g., Carstensen, Isaacowitz & Charles, 1999; Nurmi, 1994; Trommsdorff, 1994; Wohlford, 1966), but there are integrative views (e.g. Nuttin, 1985) as well. According to Lewin (1951), TP is part of an individual's orientation of psychological past and future existing at a given time. The conception of TP, as adopted by Zimbardo and Boyd (1999), is based on Lewin's model and describes TP as "the often non-conscious process whereby the continual flows of personal and social experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events." These cognitive frames may be organized as cyclical, repetitive temporal patterns or unique, non-recurring linear events. The empirically centered representation of the present is embedded between the rather abstract reconstructions of past and anticipated future events.

Temporal orientations affect people's lives by subtly influencing their appraisals, choices, and actions. If one time dimension is over-emphasized, a person is said to have a temporal bias towards the past, present, or future orientation. According to Boniwell and Zimbardo (2003), TP is one of the most powerful factors affecting human behaviour in general and quality of life in particular. It is seen as a multidimensional construct that constitutes personal TP profiles.

Every TP is associated with different attributes, behavioural patterns, and attitudes. A general future orientation is interrelated with greater academic success and health behaviour, whereas a bias towards the present is often linked to health problems and delinquency. Correlates with a negative past-orientation were often found associated to anxiety or depression.

Western individualistic cultures demand future and goal orientation, but this bears the threat of neglecting values as sense of family, community or nationality (Boniwell & Zimbardo, 2003). Thus, a balanced temporal orientation, implying a flexible shift between TPs according to the demands of the situation, is desirable. Even though this notion is intuitively plausible, there exists no consistent evidence which indicates that people with balanced TPs are happier.

Time itself can be measured precisely, but assessment of the subjective experiencing of time is more difficult. It is easily biased with attitudes and moral concepts. In the 1950s and 1960s, time used to be conceptualized as a criterion to predict a person's temporal focus. Researchers used projective measurement instruments including the TAT (Thematic Apperception Test), to test a person's temporal focus.

Their participants were shown ambiguous pictures and asked to tell a story about them. Other approaches in these decades included the "Circles Test" (Cottle, 1976), "time lines" (Rappaport, 1990), and motivational induction methods (Nuttin, 1985). Deception is less likely in such procedures, because participants do not detect which data is being measured. Conversely, projective measurement instruments do not reach satisfactory psychometric qualities and they are hard to analyse.

Another possible way to measure temporal orientation is via self report in a standardized questionnaire (e.g. DeVolder & Lens, 1982; O'Donnell, Schwab-Stone & Muyeed, 2002; Strathman, Gleicher, Boninger & Edwards, 1994). Zimbardo and Boyd (1999) criticized the existing TP-research for lacking coherence, as well as an adequate theory and a reliable and valid standard measurement procedure. Furthermore, most tests assessed only one time dimension (e.g. "Consideration of Future Consequences", CFC, from Strathman et al., 1994; "Sensation-Seeking Scale", from Zuckerman, 1994). The past orientation in all of these tests did not receive sufficient attention. Thus, Zimbardo and Boyd's (1999) goal was to establish a questionnaire which measures every dimension of time, is easy to handle, and reliable to analyse. Their questionnaire is based on theoretical considerations and offers a clear and replicable factor structure, sustainable reliability of subscales, and high validity.

Theoretical background

The ZPTI consists of 56 statements corresponding to five different time dimensions: Past-Negative, Present-Hedonistic, Future, Past-Positive, and Present-Fatalistic. The first factor, Past-Negative, reflects a generally negative and aversive view of the past. It is associated with regret, trauma and pain (e.g. "Even when I am enjoying the present, I am drawn back to comparisons with similar past experiences."). The second factor: Present-Hedonistic, corresponds to a hedonistic, risk-taking, and carefree attitude towards time and life (e.g. "It is more important for me to enjoy life's journey than to focus only on the destination."). The third factor, Future, reflects a general future orientation to become manifest in delayed gratification and planning (e.g. "I am able to resist temptations when I know that there is work to be done."). Past-Positive refers to a warm, sentimental attitude towards the past (e.g. "I enjoy stories about how things used to be in the «good old times».") and is therefore very different from Past-Negative. The fifth and final factor, Present-Fatalistic, corresponds to a fatalistic, helpless and hopeless view of future and life (e.g. "Since whatever will be will be, it doesn't really matter what I do.").

Methods

Participants

ZPTI questionnaires were administered to a German sample of N = 160 (44 males and 116 females; age range: 15–85 years, M = 30 years, SD = 14.1 years). The participants were European, where 96% were of German nationality. The

educational standard among the participants was particularly high, where 84% of the group had a high-school, university or postgraduate degree (see Tab. 1).

Tab. 1. Descriptive variables (status, gender, age in years, education and nationality) of the two German samples used

Variable	Sample	
	Test (N = 160)	Re-Test (N = 25)
status	57 employed	10 employed
	103 not employed (mostly students)	15 not employed (pupils and students)
gender	116 females	15 females
	44 males	10 males
age in years	*M* = 30	*M* = 28.1
	SD = 14.1	*SD* = 11.2
education	84 % high school	68 % high school
nationality	96 % German	96 % German

After six months, *N* = 25 individuals were re-tested (10 males and 15 females; age range 16–55, *M* = 28, *SD* = 11.2 years). Again, 96% were of German nationality and 68% had a higher educational degree.

Instruments

Funke, Reuschenbach, Pfann, Roch and Ziegler developed a German version of the ZTPI in 2003 (ZTPI-DF, 2003). This version was based on the translation of Morgenroth (ZTPI-DM, n.d.). A couple of items were revised and reformulated; four items were allocated to other scales compared to Zimbardo and Boyd (1999), according to their content and connotation. A total of *N* = 160 participants completed this adapted version of the ZTPI along with the IPC ("Fragebogen zu Kontrollüberzeugungen", locus of control; Krampen, 1981), HAKEMP ("Handlungskontrollfragebogen", action-control scale; Kuhl, 1994) and HeiPi ("Heidelberger Planungsinventar", Heidelberg Planning Inventory – an inventory constructed by ourselves).

The intention was to compare the psychometric qualities of the ZTPI-DF to those of the original questionnaire. Besides the major quality criteria of the classical test theory (objectivity, reliability, validity, and standardization), the validity of the ZTPI is controlled by the use of the Rasch-models, which determine whether or not the ZTPI satisfies the strict assumptions of the probabilistic test theory. The three main research questions which are asked are the following:

(1) Is the ZTPI-DF, as applied to a German sample, as reliable and valid as was shown in the American samples? Previous findings (Apostolidis & Fieulaine, 2004; Kolesovs, 2002, 2005; Zimbardo & Boyd, 1999), suggest that the ZTPI-DF yields reliable and valid data.

(2) Is it possible to replicate the five-factor structure as assumed by Zimbardo and Boyd? Thus far, it has only been proven possible to replicate the five-factor-

-structure in eliminating certain items or allocating items to different factors (Apostodilis & Fieulaine, 2004). Otherwise the sequence of factors, according to their contribution in explaining the total variance, could not be replicated (Kolesovs, 2002). Also, results from Ryack (2012) suggest that the factor structure depends on characteristics of the sample. Based on these results, it is unlikely that the published structure will be found in the German sample.

(3) Is the ZTPI-DF Rasch scalable? The ZTPI has been constructed on the basis of the classical test theory, which makes certain assumptions without necessarily guaranteeing them. Several of these assumptions can be tested using the Rasch-analysis. It is unlikely that the ZTPI suffices the stricter criteria of probabilistic test theory, and furthermore, analyses with different scales have raised problems concerning the five-stage response format (Rost, Carstensen & von Davier, 1999).

Statistical analyses

A linear correlation analysis was performed as a means to determine the influence that age played throughout the tests. To measure the effect of the education level (high-school, university, or postgraduates vs. lower graduation) and gender, two-sided t-tests for independent samples were used. Internal consistency was specified with the Cronbach Alpha, which indicates the retest-reliability by correlating between scores of the five factors in test and retest conditions. The validity of the results was evaluated with Pearson correlations between the scales of the ZTPI-DF, the HAKEMP, and several items of the HeiPi.

Furthermore, explorative and confirmatory factorial analyses (EFA and CFA, respectively) were performed, where the EFA was conducted as a principle component using varimax rotation. The missing values were replaced by the mean values from the available data. The number of extracted factors used for these tests were determined by theoretical consideration as well as by means of a scree test. The scree test revealed five substantive factors and an alternative factorial structure of the ZTPI-DF in the German sample, which was compared to the one found by Zimbardo and Boyd (1999) in the CFA. The model-fit was evaluated using a χ^2-test, where model-fit-indices were taken into account, as well as the alternative method relating χ^2 with the degrees of freedom (χ^2/df), as used by Zimbardo and Boyd (1999). A global Rasch-model test and a mixed-model test were administered for a more in-depth investigation of the ZTPI-DF. The criteria for the Rasch-scalability are the Bootstrap-test (χ^2, Cressie Read), BIC, CAIC, as well as Q-indices.

Results

The lowest mean in the German sample (see Tab. 2) was for Present-Fatalistic (M = 2.33), the highest mean for Past-Positive (M = 3.53). Past-Negative had a mean of M = 2.90, Present-Hedonistic M = 3.25 and Future M = 3.49, indicating that the average German is positively past-orientated and a little fatalistic. The order of means is identical for the German and the American sample.

A t-test for gender and the five subscales reveals statistical significance for the Future scale ($t(159) = 2.40$, $p < .05$). It is found that women have a higher mean

(M = 3.54, SD = 0.04) than men (M = 3.37, SD = 0.06) in the Future scale and can therefore be said to possess a stronger Future-orientation. The difference between the means seems rather small (0.17), but the power suggests that there is an 80% chance that the difference in this sample could be discovered in future tests as well (see Tab. 2).

Tab. 2. Descriptive data (mean, variance) of males and females for the five ZTPI scales and t-statistics with p-value for the gender effect (N = 160)

scale	males (N = 44)		females (N = 116)		t	p
	mean	var	mean	var		
1. Past-Negative	2.89	0.66	2.90	0.59	0.08	.933
2. Present-Hedonistic	3.21	0.54	3.27	0.41	0.61	.539
3. Future	3.37	0.39	3.54	0.39	2.40	.018*
4. Past-Positive	3.43	0.61	3.56	0.47	1.41	.159
5. Present-Fatalistic	2.36	0.56	2.31	0.47	0.49	.624

* $p < 0.05$

The correlation between age and the ZTPI-Factors provides only one significant value: The scores on the present hedonistic scale were negative associated with age (r = -.255, $p < .001$).

Finally, there is an effect of education on the results, as well. The group with lower education produced significantly higher scores on the Present-Fatalistic scale (M = 2.88, SD = 0.51) as compared to the group with higher education (M = 2.64, SD = 0.51). The difference between the two groups is significant ($t(157) = 2.21$, $p < .05$.).

There are several significant correlations between the ZTPI-DF subscales in the German sample. The correlations between Present-Hedonistic and Future are the highest (r = -.40, $p < .05$), followed by Present-Fatalistic and Past-Negative (r = .38, $p < .05$), Future and Present-Fatalistic (r = -.29, $p < .05$), Present-Hedonistic and Present-Fatalistic (r = .24, $p < .05$), Past-Negative and Present-Hedonistic (r = .23, $p < .05$) and Past-Negative and Past-Positive (r = .22, $p < .05$). Correlations between the other subscales did not reach any significant values (see Tab. 3).

The reliability of these results is assessed by using Cronbach's Alpha and a test-retest correlation. The values calculated for Cronbach's Alpha in this test do not reach those reported by Zimbardo and Boyd (1999), but exceed α = .70 (except that for the Future scale, where α = .68). Allocation of several to other scales, according to their content and connotation, noticeably increases the internal validity of the Present-Fatalistic scale. The test-retest correlations for the five subscales all reach significant values at the 1%-level and exceed r_{tt} = .70 (except for the Future scale, where r_{tt} = .65). For Past-Negative, Present-Hedonistic, and Present-Fatalistic the outcomes outrange those as reported by Zimbardo and Boyd (1999). In regards to the Future scale, it is found that the American sample provides higher values (r_{tt} = .80).

Tab. 3. Correlations between the five ZTPI scales from three different samples (G = German ZTPI-DF from this study, with N = 160; A = American version from Zimbardo & Boyd, 1999, with N = 606; F = French version from Apostolidis & Fieulaine, 2004, with N = 419)

		1. Past-N	2. Pres-H	3. Future	4. Past-P
2. Pres-H	G	.23*			
	A	.16*			
	F	-.01			
3. Future	G	-.07	-.40*		
	A	-.13*	-.29*		
	F	-.10	-.36*		
4. Past-P	G	-.22*	.30	-.02	
	A	-.24*	.18*	.12*	
	F	-.55*	.13*	.19*	
5. Pres-F	G	.38*	.24*	-.29*	.00
	A	.38*	.32*	-.26*	-.09*
	F	.37*	.32*	-.33*	-.22*

* $p < .05$

The scree test, in the context of the EFA, exhibits an ever decreasing eigenvalue between the fifth and sixth factor, as was similarly found by Zimbardo and Boyd (1999) and Apostolidis and Fieulaine (2004). Thus, the emerging five-factor model explains 36% of the total variance, where the first factor (Past-Negative) explains 12%, the second (Present-Hedonistic) 9%, the third (Past-Positive) 6%, the forth (Present-Fatalistic) 5%, and the final, fifth factor (Future), 4%. Zimbardo and Boyd (1999) found that the Future factor explained the third largest part of the variance in their tests, as followed by Past-Positive and Present-Fatalistic. This sequence, however, is altered in the German sample. Table 4 presents the factor-loadings sorted for the five-factor solution.

Confirmative factor analyses were thereafter performed, where Model 1 (item allocation according to Zimbardo and Boyd (1999)) and Model 2 (modified item allocation according to their content and connotation) were compared. The χ^2-Test was significant ($p < .001$) for both models, where Model 1 provided a $\chi^2(1484) = 2715.73$ for $N = 158$ and Model 2, a $\chi^2(1484) = 2649.76$ for $N = 158$. The results for the χ^2/df ratio, however, were not adequate and most of the model-fit indices (CFI, SRMR) suggest rejecting both models. The models hardly differ in their BIC-values (Model 1: $BIC = 23139.08$ vs. Model 2: $BIC = 23139.54$), thus making it unreasonable to qualify one model over the other one.

Finally, a Rasch-model test was performed to see if item difficulty and person ability can be identified separately. The global bootstrap-test suggests rejecting the Rasch-Model, as all the Cressie Read and Pearsons χ^2 terms reach significant values. The BIC- and CAIC-values infer that person homogeneity can be assumed,

and because the Q-indices are insignificant, Rasch-homogenity is applied (except in regard to item 52). Threshold inconsistencies (between different threshold values) suggest response tendencies. The "neutral" category does not represent a middle score, but rather the relevancy of a certain item for a certain person. Furthermore, there may be certain response sets which indicate a tendency for social desirability for several items.

Tab. 4. Item text, factor loadings and item statistics (Q = fit statistic; r_{it} = item-scale correlation) for the 56 German items of the ZTPI. Reverse item coding is indicated by square brackets

No	Text	Past-Neg	Pres-Hed	Future	Past-Pos	Pres-Fat	Q	r_{it}
50	Ich denke oft über die schlechten Dinge nach, die mir in der Vergangenheit passiert sind.	.74					.11	.65
4	Ich denke oft darüber nach, was ich in meinem Leben hätte anders machen können.	.65					.14	.59
34	Es fällt mir schwer, unerfreuliche Dinge aus meiner Jugend zu vergessen.	.65					.18	.49
16	Schmerzhafte Erfahrungen in der Vergangenheit gehen mir nicht mehr aus dem Kopf.	.62					.15	.55
27	Ich habe in der Vergangenheit Fehler gemacht, die ich gerne rückgängig machen würde.	.60					.14	.55
25	In meiner Vergangenheit gibt es zu viele unerfreuliche Erinnerungen, über die ich lieber nicht nachdenke. [reverse code]	-.58					.31	.15
22	Ich habe in der Vergangenheit genug Missbrauch und Ablehnung erlebt.	.54					.23	.33
54	Ich denke über die schönen Dinge nach, die ich in meinem Leben verpasst habe.	.54					.18	.45
33*	Die Dinge fügen sich selten so wie ich erwartet habe.	.45					.22	.40
36	Selbst wenn ich gerade die Gegenwart genieße, vergleiche ich sie doch immer wieder mit ähnlichen Erfahrungen in der Vergangenheit.	.43					.25	.34
9	Wenn etwas nicht rechtzeitig fertig ist, mache ich mir darüber keine Sorgen.	.32					.31	.17
44	Ich höre mehr auf meinen Bauch als auf meinen Verstand.		.61				.22	.42

48	Ich mag lieber Freunde, die spontan sind, als solche, die alles im Voraus planen.		.57				.22	.45
8	Ich handele impulsiv.		.54				.25	.34
28	Für mich ist es wichtiger zu genießen was man gerade tut als seine Arbeit rechtzeitig zu erledigen.		.52				.15	.55
31	Ein Leben ohne jedes Risiko ist mir zu langweilig.		.50				.19	.47
23	Entscheidungen fälle ich spontan, ohne viel zu überlegen.		.50				.31	.24
26	Für mich ist es wichtig, ein aufregendes Leben zu führen.		.46				.12	.61
42	Ich gehe Risiken ein, damit Aufregung in mein Leben kommt.		.43				.21	.43
21	Ich komme meinen Verpflichtungen gegenüber Freunden und Behörden pünktlich nach. [reverse code]		-.43				.19	.39
18	Ich ärgere mich, wenn ich zu Verabredungen zu spät komme. [reverse code]		-.40				.27	.22
52*	Mit dem Geld, das ich verdiene, will ich lieber jetzt etwas genießen, als es für schlechte Zeiten zurückzulegen.		.40				.18	.46
32	Es ist mir wichtiger, das Leben zu genießen, als mich nur auf meine Ziele zu konzentrieren.		.36				.22	.40
30	Bevor ich eine Entscheidung treffe, wiege ich Kosten und Nutzen gegeneinander ab. [reverse code]		-.32				.31	.15
12	Wenn ich meine Lieblingsmusik höre, vergesse ich die Zeit.		.32				.28	.26
2	Vertraute Bilder, Geräusche und Gerüche aus meiner Kindheit wecken in mir eine Vielzahl von wunderbaren Erinnerungen.			.62			.14	.51
15	Ich mag Geschichten über die „guten alten Zeiten".			.62			.14	.49
11	Alles in allem habe ich deutlich mehr positive als negative Erinnerungen an Erlebnisse aus meiner Vergangenheit.			.59			.12	.55
20	Erfreuliche Erfahrungen aus der Vergangenheit kommen mir leicht in den Sinn.			.56			.13	.53

41	Ich ertappe mich selbst dabei, wie ich mich ausklinke, wenn sich andere Familienmitglieder über vergangene Zeiten unterhalten.			.50			.16	.50
7	Ich denke gerne über meine Vergangenheit nach.			.50			.19	.38
49	Ich mag Familienfeste und Traditionen, die regelmäßig wiederholt werden.			.46			.22	.32
1	Das Zusammensein mit Freunden ist ein wichtiger Aspekt in meinem Leben.			.39			.33	.16
19	Wenn ich könnte, würde ich jeden Tag so leben, als wäre er mein letzter.			.38			.19	.43
5*	Meine Entscheidungen sind meistens von den Menschen und Dingen um mich herum beeinflusst.			.38			.28	.26
55	Ich mag es, wenn meine engen Beziehungen leidenschaftlich sind.			.36			.28	.27
46	Ich ertappe mich häufig selbst dabei, wie ich von der Aufregung des Augenblicks mitgerissen werde.			.35			.24	.36
29	Wenn ich an meine Kindheit zurückdenke, werde ich wehmütig.			.33			.26	.18
39	Ich halte es für sinnlos, sich über die Zukunft Sorgen zu machen, da ich ohnehin nichts daran ändern kann.				.72		.15	.50
14	Da ohnehin alles kommt wie es soll, ist es egal was ich tue.				.68		.15	.46
3	Vieles in meinem Leben hängt vom Schicksal ab.				.60		.21	.37
38	Mein Lebensweg wird von Kräften bestimmt, die ich nicht beeinflussen kann.				.59		.14	.53
37	Man kann die Zukunft nicht planen, weil sich die Dinge oft ändern.				.53		.15	.50
53	Mit Glück erreicht man oft mehr als mit harter Arbeit.				.49		.18	.46
56*	Es wird immer genug Zeit sein, meine versäumte Arbeit nachzuholen. [reverse code]				-.41		.32	.14
47	Das Leben heutzutage ist zu kompliziert; das einfachere Leben in der Vergangenheit gefiele mir besser.				.27		.24	.27

10	Wenn ich etwas erreichen will, setze ich mir Ziele und überlege genau, wie ich diese erreichen kann.					.63	.24	.31
45	Ich kann Versuchungen widerstehen, wenn ich weiß, dass es noch Arbeit zu erledigen gibt.					.62	.13	.55
40	Ich erledige Vorhaben termingerecht, da ich konsequent daran arbeite.					.53	.15	.50
51	Ich halte auch bei einer schwierigen, uninteressanten Arbeit durch, wenn es mich weiter bringt.					.53	.29	.22
13	Termine einhalten und andere notwendige Arbeiten erledigen hat Vorrang vor der Party heute Abend.					.50	.19	.43
35	Es verdirbt mir die Freude an meinem Schaffensprozess, wenn ich mir über Ziele und Resultate meiner Tätigkeiten Gedanken machen muss. [reverse code]					-.46	.22	.37
24	Ich nehme jeden Tag wie er kommt, ohne viel zu verplanen.					.45	.16	.51
6	Ich glaube, man sollte jeden Morgen den Tagesablauf im Voraus planen.					.39	.24	.31
43	Ich mache mir Listen, was ich alles zu tun habe.					.35	.30	.15
17	Ich versuche, mein Leben so ausgefüllt wie möglich zu leben, an jedem Tag aufs Neue.					.33	.31	.23

* items have been allocated to other scales due to their content and connotation

Discussion

As a part of our discussion, we would like to present the answers to the three main research questions proposed at the beginning of this paper.

(1) Does the ZTPI-DF, as applied to a German sample, prove to be as reliable and valid as the ZTPI used in the American samples? According to the classical test theory, the ZTPI-DF proves to be reliable. It shows internal consistency and stability over time (except for the Future factor) and seems to be a valid indicator for time orientation. Nevertheless, the results of the Rasch-analysis suggest that this test lacks construct validity.

(2) Is it possible to replicate the five-factor-structure as assumed by Zimbardo and Boyd? It is possible to replicate the five-factor structure in an explorative factor

analysis. The sequence of factors, according to their contribution to explaining the total variance, was slightly different in comparison to the outcomes as found by Zimbardo and Boyd (1999). Several of our factor-loadings differed from their findings and some could not be interpreted with regard to content. An alternative model which allocated several items to different scales (Model 2), could not outperform Zimbardo and Boyd's (1999) Model 1. In fact, it was shown that both models should be rejected.

(3) Is the ZTPI-DF Rasch scalable? The global Bootstrap-Test suggests rejecting the Rasch-model. The reason for this invalidity cannot be seen in lacking person homogeneity, as the mixed Rasch-model does not apply. It is likely that the problem lies within the construct or within the items; in fact, the scales seem to be multidimensional. Although the Q-indices suggest model conformity, the Rasch-model might simply be too insensitive for model-deviations. Thus, more sensitive fit-indices are desirable in future research.

In general, the ZTPI is an impressive test, through its easy handling and interpretation. It has a theoretical foundation and takes into account multi-dimensional aspects of time perspective, i.e. past, present, and future. Furthermore, the measuring instrument has remained an object of interest for decades of research, where there is an ever-continuing effort to improve it.

The quality criteria, according to the classical test theory, are satisfying in both the American and German samples. Each sample provides reasonable values in reliability, construct and criteria validity. The only exception was the Future factor in the German sample, which lacked internal consistency and stability over time. However, this may be the result of a diverse sample. Students, as well as retired persons, participated in this study, and according to previous studies, a person's time perspective changes as they age. The future factor is found to be affected by the amount and type of activities the older people partake in. This assumption can be supported by results from a sample of older people from a Belgian study (Desmyter & de Raedt, 2012). The authors of this study also report low values in terms of internal consistency (i.e. Future factor, $\alpha = .53$).

The differences between the American and German samples, in regards to the Future factor, may be due to the heterogeneity of the samples. Although Zimbardo and Boyd (1999) had larger sample sizes, the German sample provides a larger range in respect to age, education, and profession. It is intuitionally plausible that students and trainees show a stronger future-orientation than employees or annuitants. Furthermore, it must be considered that cultural differences in the construct of TP (for a review, see Sirkova et al., 2007) might cause problems in replicating the factorial structure of the ZTPI (Apostolidis & Fieulaine, 2004). A recent replication in Lithuania of the ZTPI factor structure (Liniauskaitė & Kairys, 2009) based on 1529 participants was successful in terms of goodness-of-fit indices, except for the values of CFI and TLI. Also, the Swedish version from Carelli, Wiberg & Wiberg (2011) as well as the Greek version (Anagnostopoulos & Griva, 2012) showed acceptable values in terms of the reliability of the ZTPI scales.

There is, however, a general problem concerning the five-staged response categories of the ZTPI. That is to say, the range of possible answers for several items is not used to its full capacity. Furthermore, threshold inconsistencies indicate that the "neutral" category is chosen less often as is anticipated by the distribution of person characteristics. This result suggests that this test does not measure a middle score, but rather personal relevancy. This is a common problem with five-staged response categories, and it could easily be solved by replacing it with a four-staged one. Nevertheless, the ever existing problem of response tendencies concerning social desirability remains.

Finally, as a result of the fit indices, which were used for this test, the Rasch-model is found to be inappropriate for the ZTPI-DF. That being said, if more sensitive fit indices were used on the results, and these indices also indicate that the scales are multidimensional, then the validity of the test has failed and new constructs should be formulated. As the Rasch-model does not apply to the results, the total score can be seen as an inadequate statistic for assessing the true score. Further research on a larger, homogenous sample could provide more clarity into the theoretical foundation of the ZTPI.

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