A ZIMBARDO TIME PERSPECTIVE INVENTORY (ZTPI) SURVEY OF JAPANESE UNIVERSITY STUDENTS

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Abstract

Time perspectives are dimensions of psychological time which partition experience into past, present, and future frames. This paper introduces the results from a survey of 504 Japanese university students using the Zimbardo Time Perspective Inventory (ZTPI) (Zimbardo & Boyd, 1999). Exploratory factor analysis was employed to explore the structural validity of the inventory. In addition, the relationship between time perspectives and self-reported, educationally relevant behavior/achievement criteria were investigated. The ZTPI scales were found to be of adequate reliability. Exploratory factor analysis offered mild support for the original ZTPI scale, and stronger support for a shortened version of the scale developed by Shimojima, Sato and Ochi (2012). Positive correlations of medium strength were discovered between a positive future orientation and academic performance/love of studying, while a negative medium strength correlation connects a fatalistic attitude with academic performance. The research findings add to the sizable existing body of research on broad cultural differences in time perception. A comparison of mean scores suggested that Japanese university students tend to hold more negative views toward the past and be less future-oriented than their American counterparts.

1. **Introduction**

> *Time is the water that moves our stream of consciousness, but despite its centrality in our lives, we seldom reflect upon the ways in which time draws boundaries and gives direction and depth to our lives (Zimbardo & Boyd, 2008, p. 5).*

The relationship between time and mind has fascinated and perplexed thinkers throughout the ages. Philosophers from Kant (1781/1965) to Heidegger (1927) and Husserl (1964) understand time conception to be an innate ability that profoundly influences the way in which individuals experience and make sense of the world. The Western philosophical tradition has tended to view time as linear, while the Eastern tradition has viewed it as circular. Time sense has been shown to differ between cultures (Frank, 1939; Kluckhohn & Strodtbeck, 1961; Levine, 1997; Luhmann, 2002; Poole, 2000). Hofstede (2001) distinguishes between a long (Eastern) versus short-term (Western) orientation, while Zimbardo and Boyd (2008) claim that the success of Western civilization in the nineteenth and twentieth centuries can be accounted for by "the prevalence of the future orientation of many populations" (p.137).

Our actions are not only contingent on the present situation, but on past experiences and future expectations (Lewin, 1951; Fraisse, 1963; Bandura, 1997). For some, memories of the past are a comforting, nostalgic presence, while others are traumatized by memories of the past to the extent that present action is constrained. Some invest time and effort in activities in the expectation of future gain, while others live 'for the moment' with little thought for the future. These are examples of how a given individual may differ in terms of his/her *time perspectives.* Zimbardo and Boyd (1999) argue that the construction of psychological time emerges from cognitive processes

dividing human experiences into three such perspectives: present, past, and future temporal frames[1]. They define a time perspective as "an often nonconscious 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" (ibid. p. 1271). These frames "…are used in encoding, storing, and recalling experienced events, as well as in forming expectations, goals, contingencies, and imaginative scenarios" (ibid. pp. 1271-2). They are understood to be powerful and pervasive individual difference variables.

2. Time Perspectives And The Ztpi

The Zimbardo Time Inventory (ZTPI) (Zimbardo & Boyd, 1999) is an attempt to draw together existing theory into an instrument to measure multiple dimensions of time perspective orientations. It measures five broad areas of time perception: Past-negative, Past-positive, Present-hedonistic, Present-fatalistic, and Future perspectives. If the individual tends habitually to emphasize a particular time perspective when making decisions, this represents a cognitive bias that is predictive of certain behaviors. Past-negative and present-fatalistic orientations are associated with psychological ill health and self-destructive behaviors, while past-positive and future orientations are associated with psychological health and a productive lifestyle. A future orientation predicts higher economic status, academic achievement, less attention seeking, and fewer risky behaviors. Those with hedonistic or fatalistic orientations are more likely to exhibit risk-taking behaviors and suffer from crime, addiction, and juvenile delinquency (Devolder & Lens, 1982; Fraisse, 1963; Levine, 1997; Nuttin, 1985; Strathman et. al, 1994; Zaleski, 1994). Details of the five time perspectives are summarized in table 1:

Time perspective	Characteristics	Consequences
Past positive (PP)	Pleasant, sentimental, and nostalgic views of the past; an emphasis on relationships with friends and family.	Mental and physical good health (Zimbardo & Boyd, 1999; Hamilton et al., 2003).
Past negative (PN)	A focus on negative (aversive, traumatic, regretful etc.) past experiences.	Various mental health problems (Sircova, Sokolova & Mitina, 2008; Laghi et al., 2009); lack of life satisfaction (Boniwell et al., 2010; Shipp, Edwards & Lambert, 2009); negative interpersonal relationships (Holman & Zimbardo, 2009; Sircova, Sokolova & Mitina, 2008).
Present hedonistic (PH)	A tendency to live in the present; sensation seeking and behavior without regard for consequences.	Novelty, sensation seeking (Zimbardo & Boyd, 1999); substance abuse (Fieulaine & Martinez, 2011); curiosity and exploration (Kashdan, Rose & Fincham, 2004); life satisfaction (Boniwell et al., 2010).
Present fatalistic (PF)	Hopeless, negative, or cynical views towards the future, which is beyond control and thus of little consequence.	Aggression, anxiety, depression (Zimbardo & Boyd, 1999); suicidal thoughts (van Beek et al., 2011); tobacco/alcohol use (Daugherty & Brase, 2010); procrastination (Ferrari & Diaz-Morales, 2007).
Future (F)	Goal-setting and long-term planning; the ability to delay gratification.	Conscientiousness and self-study (Zimbardo & Boyd, 1999); academic performance (Worrell & Mello, 2007); adjustment to stressful events (Holman & Silver, 2005); pro-environmental attitudes and behaviors (Milfont & Gouveia, 2006);

Table 1. The five time perspectives of the ZTPI.

[1] The initial inspiration for the research arose from Zimbardo's experience running the infamous Stanford Prison Experiment (Zimbardo et. al, 1973) and the way in which many of the participants became completely immersed in the present experience, without any "concern for their shared past or any interest in the future after they were released" (Zimbardo & Boyd, 1999, p. 1273).

Such biases contrast with a *balanced time orientation*, which describes an ideal mental framework allowing individuals to "flexibly switch temporal frames among past, future, and present depending on situational demands, resource assessments, or personal and social appraisals" (Zimbardo & Boyd, 1999, p. 1272). A balanced perspective is low on past-negative and present-fatalistic time perspectives, and strong on future and past-positive perspectives (Zimbardo & Boyd, 2008).

The ZTPI has been validated in various contexts such as France (Apostolidis & Fieulaine, 2004), Spain (Díaz-Morales, 2006), Mexico (Corral-Verdugo, Fraijo-Sing & Pinheiro, 2006), Italy (D'Alessio et al.), and Japan (Shimojima, Sato & Ochi, 2012). Recently, Secova et al. (2014) examined the extent to which the ZTPI captures dimensions of time perspective in more than 20 countries. They found that the five temporal orientations are invariant across many cultures.

In the Japanese context, Shimojima, Sato and Ochi (2012) tested the ZTPI on 748 university students. They concluded that a reduced version of the ZTPI, with 13 items deleted (hereafter referred to as the JZTPI) was better suited to the Japanese context. In a subsequent study, Takahashi et al. (2013) used the JZPTI to investigate the time perspectives of 1063 Japanese workers. A factor analysis confirmed the underlying structure of the ZPTI. In addition, criteria such as job satisfaction, organizational commitment, career orientation, and leadership were found to correlate significantly with ZPTI sub-scales.

To my knowledge, these two studies are the only research to have been undertaken in the Japanese context. The research presented here serves to add to this moderate body of work by seeking further validation for the JZPTI construct, and by assessing how learner behavior and time perspectives are related. The research objectives are as follows:

a. To compare the reliability of the ZTPI and JZTPI scales in the Japanese university context.

b. To compare the structural validity of the ZTPI and JZTPI scales using exploratory factor analysis.

c. To test the correlation between time perspectives and a number of self-reported behaviors such as academic performance, English proficiency, and smartphone use.

d. To compare mean ZTPI/JZTPI scores in the Japanese context with findings from other cultural contexts.

3. Method

This research sought to replicate and build on the two previous Japan-based studies using a modified ZPTI inventory (see table 2). The ZTPI is a 56-measure scale consisting of five subscales. It requires respondents to rate how characteristic a statement is of them from *Very characteristic* to *Very uncharacteristic* on a 5-point Likert scale. The modified version was based on a version developed by Shimojima, Sato, and Ochi (2012). A number of items were edited to improve readability and clarity of meaning. Item 22 was incorrectly reported as PP rather than PN in the aforementioned study. Objective 1 was addressed through Cronbach alpha calculations, and objective 2 was addressed through factor analyses of the results of the ZPTI and the JZPTI (the ZPTI minus items 1, 10, 14, 17, 20, 22, 27, 39, 41, 55, 56, 57, and 66). To address objective 3, the questionnaire included an additional 14 items (shown in bold) designed to explore a range of perceptions of behaviors and attitudes that my experience has led me to believe might be directly or indirectly of influence on learning behavior. These included behaviors/attitudes such as studying merely for credit, love of language learning, reading/smartphone habits, international orientation, and alcohol/tobacco use. Objective 4 was achieved through the use of descriptive statistics for scale scores.

The desired sample was Japanese university students. Beyond this, sampling was opportunistic, the objective being to maximize the number of respondents. To this end, participants were recruited from classes at the university where the writer works. A total of 504 university students (39% male, 61% female) completed the questionnaire.

Students were drawn from the International Studies (n=339), Policy Studies (n=106), and Agriculture departments (n=59), and from the first (n= 185), second (n=167), third (130) and fourth grades (n=22). Department and grades were calculated from the information provided by colleagues. Information about age, department and grade was not included in the questionnaire, nor factored into the analyses.

PH1	1友達同士で集まって盛り上がるのは人生の中で大切な楽しみのひとつだと思う。
PP1	2懐かしい光景、音、匂いによって幼い頃の良い思い出がよみがえることがよくある。
PF1	3私の人生は運命によって定められるところが多い。
PN1	4人生の中で、ああすべきだったのにと思うことが多い。
PN2	5私の決断は、周りの人や出来事によって大いに影響される。
	6単位を取るためだけに勉強している。 [I study merely to earn credit]
F1	7人は毎朝、その日の予定を計画するべきだと思う。
PP2	8昔のことを考えるのは楽しい。
PH2	9衝動的に行動することがある。
F2	10時間通りに物事が進まなくても心配はしない。
F3	11何かをやり遂げようとするとき、目標を決めてそれに到達するための具体的な方法を検討する。
	12語学学習が大好き。 [I love studying languages]
PP3	13昔のことを思い出すと、悪い思い出よりも良い思い出の方が全体的に多い。
PH3	14大好きな音楽を聴いていると、時間を忘れることがよくある。
F4	15夜遊びに行くことよりも、明日までにやるべきことや必要なことを終える方が大切だ。
PF2	16なるようにしかならないので自分が何をしてもあまり関係ない。
PP4	17「古きよき時代」の話が好きである。
	18定期的に本を読む。 [I read books regularly]
PN3	19過去のつらい経験が繰り返し頭に浮かぶ。
PH4	20一日一日を精一杯生きようとしている。
F5	21約束の時間に遅れるのは嫌いだ。
PH5	22毎日を人生最後の日だと思って過ごすのが理想である。
PP5	23楽しかった思い出がすぐに心に浮かぶ。
	24スマートフォンに多くの時間を費やしている[I spend lots of hours on my smartphone]
F6	25友人や上司・教師などに対する義務は遅れずに果たす。
PN4	26過去に虐待や拒絶をそれなりに経験した。
PH6	27その場のはずみで物事を決めてしまうことがある。
F7	28毎日を計画的というよりは成り行きで過ごす。
PP6	29嫌な思い出が多いので、過去のことは思い出したくない。
	30ビデオゲームをたくさんする。 [I play video games a lot]
PH7	31人生に刺激は重要だ。
PN5	32取り消してしまいたい間違いを過去に犯したことがある。
PH8	33時間内に終えることよりも、やっていることを楽しむことの方が大切だと思う。
PP7	34幼い頃が懐かしいと思う。
F8	35決断する前にメリットとデメリットを比べてみる。
	36勉強が大好き。 [I love to study]
PH9	37危険をおそれないからこそ人生は退屈でなくなる。
PH10	38人生のゴールだけを考えるよりも、その道のりを楽しむことが大切だ。
PN6	39物事が期待通りにうまくいくことはめったにない。
PN7	40若い頃の嫌なイメージを忘れることは難しい。
PF3	41目標、結果、成果について考えなければならないならば、自分の行動の最中の 楽しみが奪われてしまう。

	42部活やサークルをやっており、これは私の大学生活の最も重要な一部である**[Participating in a club/circle is the most important part of my university life]**
PN8	43今を楽しんでいるときでも、つい過去のよく似た経験と比べてしまう。
PF4	44物事は変化するので、将来の計画を立てるのは実際には不可能だ。
PF5	45人生の進路は、自分ではどうしようもない力によって決められている。
PF6	46どうしようもないことなので、将来について心配しても仕方がない。
F9	47コツコツと取り組んで時間通りに課題を終了する。
	48学習によってストレスをたくさん受ける。[I have a lot of study-related stress]
PP8	49家族が昔はああだった、こうだったと話し出しても耳を貸さない。
PH11	50人生の刺激を得るために冒険をする。
F10	51やるべきことをリストにする。
PH12	52自分の頭ではなく気持ちに従うことが多い。
F11	53やるべきことがあるとき、誘惑に耐えることができる。
	54自分自身を「国際的な人物」と見なしている。**[I see myself as an international person]**
PH13	55興奮して我を忘れることがある。
PF7	56現代の生活は複雑すぎる。昔のシンプルな生活の方がいいと思う。
PH14	57わかりやすい人よりも思いつきで行動する人の方が友人として好ましい。
PP9	58何度も繰り返される家族の行事や伝統が好きだ。
PN9	59過去に起きた嫌な出来事について考えることがある。
	60テレビをよく見る。[I watch a lot of TV]
F12	61前進するためならば、難しくても、おもしろくない課題に取り組むことができる。
PF8	62稼いだお金は、明日のために貯金するよりも今日の楽しみに使う。
PF9	63成功は努力よりも運で決まることが多い。
PN10	64人生の中でやりそこなった楽しいことについて考えることがある。
PH15	65親密な関係は情熱的な方がいい。
F13	66仕事や課題の遅れを取り戻す時間は後でいくらでもある。
	67（２０歳以降の方のみ）タバコをたくさん吸う。[I smoke a lot]
	68（２０歳以降の方のみ）アルコールをたくさん飲む。[I drink a lot]
	69. 性別に〇をつけてください。[sex]
	70 もしご存知なら、一番最近の TOEIC スコアを書いてください。[TOEIC score]
	71 他の語学力テストの結果があれば、テストの名前と点数を書いてください。[Alternative English proficiency measure]
	72 （２年生以上のみ）一番最近の平均点やGPAをご存知なら記入してください。[GPA average]

Table 2. The Zimbardo Time Perspective Index (ZTPI)

Participation in the study was voluntary. No identifying personal data (name, student number) were collected. A statement at the head of the questionnaire explained that the data would be kept private, that no personal data would be made public, or used for anything other than research purposes. Questions asking about alcohol or tobacco use were designated "*for respondents aged 20 or over only*".

4. Results

4.1 Scale reliability

For both ZTPI and JZTPI scales, intercorrelation values were within the range of those reported in comparable studies (Zimbardo & Boyd, 1999; Worrell & Mello, 2007) (up to r.38), and in line with the recommendation by Clark and Watson (1995) that a mean inter-item correlation of up to .40 or .50 is acceptable for scales measuring reasonably narrow ranges (see Table 2). Zimbardo and Boyd (1999) reported Cronbach Alpha's scores of .74 to .82.

in their original study. The values here are somewhat lower, but in line with comparable studies (Shimojima, Sato, & Ochi, 2012; Worrell & Mello, 2012). Given the fewer number of items in the JZTPI, it is notable that three of the subscales measured higher in reliability than their ZTPI equivalents. As with other studies, reliability for the past-negative and present-fatalistic scales were lower than for the other scales (see, for example, Sircova et al., 2014).

ZTPI								
	PH	PP	PN	F	M	SD	Item	Reliability
PH					3.37	0.46	15	.726
PP	.303**				3.53	0.6	9	.656
PN	.172**	-.082			3.16	0.69	10	.750
F	-.052	.136**	.070		3.17	0.61	13	.756
PF	.216**	-.098*	.233**	-.233	2.75	0.61	9	.648
JZTPI								
	PH	PP	PN	F	M	SD	Item	Reliability
PH					3.79	0.57	8	.695
PP	.310**				3.62	0.63	8	.662
PN	.094*	-.125**			3.15	0.73	9	.761
F	-.001	.154**	.061		3.17	0.63	11	.749
PF	.162*	-.146**	.189**	-.197**	2.32	0.60	6	.653

Table 3. Intercorrelations and reliability of subscales.

4.2 Exploratory factor analysis

The 56 items of the ZTPI and the 43 items of the JZTPI were each subjected to principal components analysis (PCA) using SPSS version 24. Prior to performing the PCA the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Oklin values were .795/.785 respectively, exceeding the recommended value of .6 (Kaiser, 1970, 1974) and the Barlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix.

For the ZTPI, principal components analysis revealed the presence of 15 components with eigenvalues exceeding 1, collectively explaining 56.018% of variance. An inspection of the screeplot (Catell, 1966) showed a clear drop off in eigenvalues after the third factor, but no clear break or 'elbow' in the curve after the fifth factor as would be expected if the ZTPI was of ideal structural validity. The results of Parallel Analysis showed seven components with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same size (55 variables x 504 respondents). A principal components analysis of the JZTPI revealed the presence of 12 components with eigenvalues exceeding 1, collectively explaining 55.799% of variance. In line with ZTPI analysis, an inspection of the screeplot showed a clear drop off in eigenvalues after the third factor. However, for the JZTPI there was a reasonably clear break in the curve after the fifth factor. The results of Parallel Analysis were comparable to those of the ZTPI.

A varimax-rotated solution of a five-factor ZTPI revealed the presence of simple structure (Thurstone, 1947), with the components showing reasonably strong loadings, explaining a total of 33.011% of the variance. However, four PP items loaded substantially on the PN factor (this can presumably be accounted for by the fact that those with a negative view of the past do not have a positive view of it). The findings are nevertheless more encouraging than those of Worrell and Mello (2012), who concluded that the majority of the items on the ZTPI are not salient with a five-factor structure. In their study, with the exception of PN, less than five items contributed meaningfully to each factor. A similar simulation of a five-factor model of the JZTPI was performed (see Table 3), and the solution showed a number of strong loadings and all variables loading substantially on only one component. The solution explained a total of 36.539% of the variance (running the same analysis with the item PP8 raised the value to

37.084%). These results are favorable in comparison to the average reported values. In a meta-analysis of results from 27 countries, for example, Sircova et. al (2014) reported values ranging from 29.92% to 38%, and Zimbardo and Boyd's initial exploratory factor analysis (1999) explained 36% of the variance.

	Factor				
	1	2	3	4	5
PN3	**.702**	.160	-.008	-.260	.151
PN9	**.664**	.175	.049	-.131	.053
PN5	**.618**	-.074	.077	-.054	-.024
PN1	**.617**	-.093	-.118	.117	.036
PN8	**.571**	.063	.071	.019	.125
PN7	**.568**	.083	.043	-.174	.067
PN10	**.536**	.021	.106	.135	.164
PN2	**.410**	-.256	-.038	.200	-.063
PP1	**.344**	.141	.188	**.337**	-.033
F9	-.116	**.677**	-.117	.016	.065
F7	-.118	**.588**	-.276	-.058	-.161
F6	.062	**.568**	.035	.226	-.017
F4	.108	**.562**	-.158	.040	-.092
F3	-.049	**.549**	.233	-.024	-.028
F5	.101	**.546**	-.092	.121	.060
F11	-.061	**.532**	.034	.004	.023
F12	-.019	**.485**	.268	-.008	-.219
F10	.078	**.472**	.185	.063	-.034
F1	.194	**.404**	.013	.054	-.003
PF8	-.079	**-.329**	.220	-.016	.225
F8	.287	**.305**	.140	-.105	-.087
PH11	-.046	.060	**.718**	-.011	.005
PH9	-.163	.135	**.671**	-.041	.070
PH7	.115	.044	**.617**	.119	-.174
PH10	-.020	.142	**.505**	.216	-.117
PH8	.039	-.261	**.452**	.228	.086
PH15	.120	.034	**.443**	.073	-.015
PH12	.106	-.242	**.429**	.071	.160
PH2	.225	-.149	**.419**	.148	.125
PP6	**-.433**	-.083	.082	**.606**	-.154
PP3	**-.370**	-.006	.244	**.603**	.014
PP2	.148	.034	.118	**.588**	.076
PP9	.042	.141	-.010	**.566**	-.056
PP7	**.325**	.030	.200	**.503**	-.107
PP5	-.062	.071	.290	**.500**	.071
PN4	.253	-.017	.009	**-.434**	.150
PF5	.159	.001	-.024	-.064	**.714**
PF6	-.142	-.043	.100	-.059	**.693**
PF2	.074	-.155	-.030	-.088	**.624**
PF9	.110	-.274	.038	-.097	**.482**
PF1	.199	.104	-.015	.173	**.473**
PF4	.123	-.074	.267	-.219	**.420**
TV	-.005	.065	-.158	.043	**.327**
PP8	-.068	.164	-.123	.260	-.261

Table 4. Pattern/structure coefficients from the five-factor varimax rotation (JZTPI)

The results support Shimojima, Sato, and Ochi's (2012) contention that the shorter JZTPI is more structurally valid than the full-length ZTPI inventory in the Japanese context.

4.3 Correlation analysis

The relationship between ZTPI time perspective orientations and various self-report items were measured using Pearson product-moment correlation coefficient analysis. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Positive correlations of >r.3 were observed between a future orientation (F) and love of studying and grade point average, and a present fatalistic orientation (PF) and studying merely to gain credit (ZTPI only). Negative correlations of >r.3 are observed between a preset fatalistic orientation and GPA score (see Table 4). Numerous smaller yet statistically significant correlations are observed that support claims that future and past positive orientations are correlated with positive behaviors. Use of multi-item scales to address self-reported behaviors would likely have resulted in higher r values.

	PH		PN		PP		F		PF	
ITEM	ZTPI	JZTPI	ZTPI	JZTPI	ZTPI	JZTPI	ZTPI	JZTPI	ZTPI	JZTPI
6	-.003	-.097*	.110*	.110*	-.080	-.097*	-.208**	-.188**	**.311****	.274**
12	.120**	.217**	-.032	-.029	.226**	.217**	.177**	.182**	-.210**	-.172**
18	.037	-.023	.088	.089*	.013	-.023	.114*	.141**	.070	.056
24	.165**	.145**	.091*	.091*	.125**	.145**	-.207**	-.218**	.041	.082
30	-.062	-.167	.157**	.145**	-.134**	-.167**	-.087	-.078	.189**	.167**
36	.061	.039	.280**	.050	.047	.039	**.383****	**.404****	-.101*	-.115*
42	.093*	-.002	-.109*	.168**	.004	-.002	-.040	-.030	.082	.114*
48	.130**	-.017	.280**	.269**	-.013	-.017	-.083	-.118**	.168**	.164**
54	.198**	.146**	-.109*	-.103*	.146**	.146**	.013	0.67	.076	.075
60	-.048	-.030	.024	.033	-.032	-.030	-.006	.017	.152**	.170**
67	-.018	-.223**	-.010	.003	-.184**	-.223**	-.189**	-.151*	.209**	.208**
68	.190**	-.012	-.075	-.069	.004	-.012	-2.54**	-.219**	.196**	.220**
71	-.018	-.002	-.119	-.113	-.003	-.002	.069	.114	.057	.047
72	-.143	-.136	-2.32*	-.219	-.150	-.136	**.404****	**.451****	**-.336****	**-.306****

Table 5. Pearson product-moment correlation coefficient values.

4.4 Comparison Japanese and American mean scores

A comparison of mean ZTPI scale scores of this study and three previously published studies shows that Japanese college-age students (n=1252) are, on average, stronger in past-negative orientation, and weaker in future orientation than their American counterparts (n=1176) (see Table 5).

Variable	**JCS (ZTPI) (N=504)**	USCS (n=361)*	USCS (N=815)**	**JCS (JZTPI) (n=504)**	JCS*** (JZTPI) (n=748)
	M (SD)	M (SD)	M (SD)	**M (SD)**	M (SD)
PH	**3.37 (0.46)**	3.44 (0.51)	3.39 (0.52)	**3.79 (0.57)**	3.56 (.60)
PN	**3.53 (0.6)**	2.98 (0.72)	3.19 (0.71)	**3.62 (0.63)**	3.34 (.77)
PP	**3.16 (0.69)**	3.71 (0.64)	3.40 (0.54)	**3.15 (0.73)**	3.63 (.65)
F	**3.17 (0.61)**	3.47 (0.54)	3.35 (0.56)	**3.17 (0.63)**	3.27 (.61)
PF	**2.75 (0.61)**	2.37 (0.60)	2.56 (0.63)	**2.32 (0.60)**	2.44 (.69)

Table 6. A comparison of Japanese and American mean ZTPI scale scores.
*Notes: Current findings shown in bold; JCS=Japanese college students; USCS=US college students; *Zimbardo & Boyd, 1999; **Worrell & Mello, 2012; ***Shimojima, Sato, & Ochi, 2012.*

5. Discussion and Conclusion

The findings of this research suggest that the JZPTI is superior to the original ZTPI as an inventory to measure time perspective in the Japanese context, in terms of both scale reliability and structural validity. The exploratory correlation analysis produced correlations of +/-r.3 between: i) a future orientation (F) and love of studying and grade point average; ii) a present fatalistic orientation (PF) and studying merely to gain credit (ZTPI only); and iii) a fatalistic orientation and GPA score. These results broadly support existing research suggesting the benefits of a future orientation. Finally, a comparison of mean scores suggested that Japanese students might be stronger in past-negative orientation, and weaker in future orientation than their American counterparts. The findings of this study are an addition to the growing body of research into time perception, particularly research conducted in Japan.

Several weaknesses of the study can be identified. First, it would have been desirable to collect more accurate demographic data on the participants in order to report the sample make-up more accurately, as well as to provide additional factors for an exploratory correlation analysis. In addition, the selection of the items for this analysis might more profitably have been constructed according to an existing rubric/schema (for example by following the lead of Takashima et al., 2012) rather than simply drawing on the writer's own experience. Doing so might have resulted in stronger correlation scores that could be better tied to existing research. Any future research examining such correlations between time perspective and study-related habits will of course benefit from the use of carefully piloted, multi-item scales instead of the single item-scales used here.

In closing, I would like to propose that psychometric research on time perspectives ought to be complimented by qualitative investigations into individual experience. In previous research (Pigott, 2017, in press) I examined the relationship between significant, memorable events and learning behavior. Such events are seminal moments in awareness, promoting learning in accelerated ways. They have a traumatic, shocking, or risky element, and they are unplanned and unanticipated (Cope & Watts, 2000; Tripp, 1993; Webster & Mertova, 2007). The research findings suggested that significant events have two particularly important functions. First, they cause an immediate change in learning-related beliefs and behavior; second, they underlie beliefs and behavior 'from a distance' as a key constituent of learning-relevant memories and narratives. The findings of my research led me to understand that the twists and turns of the learning process that psychometric research typically overlooks are fundamental to understanding learning behavior. Much of what is generally considered 'motivated' behavior in the classroom may in many cases be rooted in some form of significant event that happens outside the classroom.

I believe that a qualitative approach that investigates the individual's response to idiosyncratic life events can serve as a useful and illuminating counterpart to the study of general tendencies or traits through a psychometric approach. Such an approach may offer insight, for example, into how time perspectives are shaped and modified. Combining trait-based perspectives with case studies of how these traits manifest in social context appears to be a fruitful future avenue for researchers.

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