Putting Time in Perspective: A Valid, Reliable Individual-Differences Metric

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> *For us convinced physicists, the distinction between past, present, and future is an illusion, although a persistent one.*
>
> —Albert Einstein

Although Einstein's theory of relativity (1931) established the subjective nature of the physical phenomenon of time, the significance of the psychological interpretation of this relative phenomenon has been a source of controversy among philosophers, psychologists, and physical scientists. Monitoring time may be a basic function of human development that was vital in the evolution of human cognitive functioning (Suddendorf and Corballis 1997). Kant (1781/1965) believed time conception to be an "innate ability," arguing that it richly colored the way that people experience the world, and later existential philosophers and psychologists expounded on his notion of time (Heidegger 1927; Husserl 1964). William James (1950/1890) championed the concept of time as so central to psychology that he devoted an entire chapter to "time perception" in *The Principles of Psychology*. With the later behaviorist revolution came a restricted focus on the behavioral consequences of time-based experiences. This narrow view was rejected by Kurt Lewin (1942), whose views are more compatible with those of existential philosophers.

Lewin's life space model included the influence of both the past and the future on current behavior. Lewin (1951) defined time perspective (TP) as "the totality of the individual's views of his psychological future and psychological past existing at a given time" (p. 75). This integrative view of all temporal frames within the present moment is akin to Eastern Zen notions of time that are more circular (see Ornstein

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1975), and it runs counter to the traditional Western view in which time flows at a constant, linear rate, never to be reclaimed. More recently, Joseph Nuttin (1964, 1985) supported the Lewinian time-filled life space, where "future and past events have an impact on present behavior to the extent that they are actually present on the cognitive level of behavioral functioning" (1985, p. 54). Contemporary social–cognitive thinking, as represented in Albert Bandura's (1997) self-efficacy theory, advances a tripartite temporal influence on behavioral self-regulation as generated by efficacy beliefs grounded in past experiences, current appraisals, and reflections on future options. Behavioral gerontologist Laura Carstensen and her colleagues (Carstensen et al. 1999) have proposed that the perception of time plays a fundamental role in the selection and pursuit of social goals, with important implications for emotion, cognition, and motivation.

Nevertheless, the study of psychological time in general, and of TP in particular, languishes off the shore of mainstream contemporary psychology. The goal of the research program reported here is to refocus efforts toward recognizing the centrality of TP in many domains of psychology as well as promoting the value of including TP in new research paradigms as an independent, dependent, or intervening variable.

Our General Conceptual Model of TP

The model guiding our thinking and research continues in, and extends, the Lewinian tradition by advancing a broad conceptualization of TP as a foundational process in both individual and societal functioning. TP is the 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. These cognitive frames may reflect cyclical, repetitive temporal patterns or unique, nonrecurring linear events in people's lives (Hall 1983). They are used in encoding, storing, and recalling experienced events, as well as in forming expectations, goals, contingencies, and imaginative scenarios. Between the abstract, psychological constructions of prior past and anticipated future events lies the concrete, empirically centered representation of the present.

We argue that these learned TPs exert a dynamic influence on many important judgments, decisions, and actions. For example, how might a decision to take an action be influenced by individual tendencies to emphasize a particular temporal frame? The dominant influence for some comes from the past, from recalling analogous prior situations, with memory of the costs and benefits that attended those decisions. Their recall may be nostalgic and positive or ruminative, traumatic, aversive, and negative, and they may remember accurately or distort the past. Such a focus on the past can significantly affect the interpretation of and response to the current decision situation, even dominating its intrinsic stimulus power. For others, the influential forces on this hypothetical decision come from anticipations and expectations constructed to embody an extension of the present into a future when the calculated costs of this current action will be paid or rewards will be reaped.

Their decision process may include creating alternative goal states, means–ends relationships, and probabilistic assessments of both desired components and reality-based potential impediments and challenges, as well as weighing predicted favorable consequences against longer-term estimated costs.

In both cases, the abstract cognitive processes of reconstructing the past and constructing the future function to influence current decision making, enabling the person to transcend compelling stimulus forces in the immediate life space and to delay apparent sources of gratification that might lead to undesirable consequences. In dramatic contrast to these, two "top-down" decision makers stand those whose decisions tend to be primarily "bottom-up," influenced by the sensory, biological, and social qualities associated with the salient elements of the present environment. Their actions are a product of the forces of situational press, the intensity or quality of the stimulus, the prevailing biological state, or the social aspects of the situation.

When a tendency develops to habitually overemphasize one of these three temporal frames when making decisions, it serves as a cognitive temporal "bias" toward being past, future, or present oriented. When chronically elicited, this bias becomes a dispositional style, or individual-differences variable, that is characteristic and predictive of how an individual will respond across a host of daily life choices. Of course, individuals use these temporal orientations to varying degrees, and each orientation may lead to an optimal decision in specific situations.[1] Temporal bias may include either habitual overuse or underuse of one or more of these temporal frames. Such limiting biases contrast with a "balanced time orientation," an idealized mental framework that allows individuals to flexibly switch temporal frames among past, future, and present depending on situational demands, resource assessments, or personal and social appraisals. The behavior of those with such a time orientation would, on average, be determined by a compromise, or balancing, among the contents of meta-schematic representations of past experiences, present desires, and future consequences.

Thus, we conceive of TP as situationally determined and as a relatively stable individual-differences process. Overreliance on particular temporal frames is multiply determined by many learned factors, with cultural, educational, religious, social class, and family modeling among the most prominent. Because the operation of TP is so pervasive in people's lives and is multiply determined, people are rarely aware of its subtle operation, influence, or biasing powers. It is our contention that this construct provides a foundation on which many more visible constructs are erected or embedded, such as achievement, goal setting, risk taking, sensation seeking, addiction, rumination, guilt, and more.

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[1] At this point, we must acknowledge our theoretical and personal bias toward evaluating decisions from a future orientation. It is only from the perspective of future orientation that the decision to smoke can be seen to have a negative consequence: the future development of lung cancer. If judged solely through the lens of present orientation, smoking is just a pleasurable activity without articulated future consequences. In the context of present orientation, smoking may actually be the "right" decision, because it may lead to pleasure, however short lived.

State of Research on TP

Given the complexity of this construct, it is no wonder that TP has been measured and operationally defined in a variety of different ways by independent investigators. Most research has tried to relate either future or present orientation to other psychological constructs and to their effects on selected outcome behaviors, with relatively little attention to past orientation. In general, future orientation has been related to many positive consequences for individuals in Western society, such as higher socioeconomic status, superior academic achievement, less sensation seeking, and fewer health risk behaviors. The opposite holds for those with a dominant present orientation, who are seen as at risk for many negative life consequences, among them mental health problems, juvenile delinquency, crime, and addictions, when they function in a predominantly future-oriented society (e.g., see DeVolder and Lens 1982; Fraisse 1963; Levine 1997; Nuttin 1985; Strathman et al. 1994; Zaleski 1994).

We believe that the reason why this intriguing, seemingly central aspect of the human experience has not been incorporated into current domains of psychological science involves the disjointed, noncumulative nature of past research; the lack of adequate theory; and the absence of a standard, reliable, and valid measure for assessing TP. Previous attempts to capture the complexity of TP in a single index have used the Thematic Apperception Test (Wohlford 1966), the Experiential Inventory (Cottle 1968), the Circles Test (Cottle 1976), the motivational induction method (Nuttin 1985), questionnaires (Bond and Feather 1988; Roos and Albers 1965a, b), and time lines (Rappaport 1990), among others. However, none of these methods have been widely accepted because of their low reliability or scoring difficulties. Because the meaning of TP must be closely linked to the standardized operations used to assess it effectively, such disparate definitions and methods have hindered the fuller development of this domain of psychological inquiry.

Attempts at conceptual simplification have tended to focus on only a single dimension, such as the present or future, without the complicating influence of the other temporal dimensions; examples are a future anxiety scale (Zaleski 1996), the consideration of future consequences scale (Strathman et al. 1994), and a well-known sensation-seeking scale whose features emphasize present-oriented functioning (Zuckerman 1994). Although these scales are improvements over previous graphical or story-based attempts to measure TP, they are literally one dimensional. By focusing on but one dimension, they fail to provide assessments of the relative strengths of the other dimensions within individual temporal profiles. Moreover, they assume, incorrectly, that scoring low on a scale of future orientation is equivalent to scoring high on a scale of present orientation or that scoring low on a measure of the present is equivalent to being future oriented. (We present data later that challenge such reciprocal equivalencies.) Notably absent from these scales is any representation of the past. This shortcoming is especially troubling in light of the current debate in psychology and psychiatry concerning repressed memories versus

"false memory syndromes," as well as the increased recognition of the ubiquity of posttraumatic stress disorders. These controversies suggest that the past, as personal reconstruction, plays a critical role in much individual and group behavior (Clark and Collins 1993).

We argue that the scale described in this article, the Zimbardo Time Perspective Inventory (ZTPI), addresses the shortcomings of previous scales. It is easy to administer and score, with a clear, replicable factor structure; reasonable subscale reliabilities; and demonstrated validity. It provides a quantifiable measure of multiple time frames as individual temporal profiles, assesses broad dimensions of TP, and is built on a theoretical foundation combining motivational, emotional, cognitive, and social processes that are assumed to contribute to—and are, in turn, influenced by—the operation of TP. Some of our research reveals the extent to which TP is related to a large, diverse constellation of well-known psychological constructs and personality scales. At a conceptual level, TP may unite or integrate diverse constructs in previously unrecognized ways, and use of the ZTPI, it is hoped, will serve as an impetus to bring order, coherence, and predictive power to the next generation of research on TP.

ZTPI Scale Construction

Overview

The process of developing the final version of the ZTPI presented in this article involved repeated iterations over many years. The scale is based on theoretical reflection and analyses, interviews, focus groups, repeated factor analyses, feedback from experiment participants, discriminant validity analyses, and specific attempts to increase factor loadings and internal consistencies by item analyses and revisions.

The initial impetus for developing this individual-differences measure came from early life experiences of Philip G. Zimbardo and his observations of the dramatic alterations in TP that occurred during the weeklong Stanford Prison Experiment (Zimbardo et al. 1973). One aspect of the power of the situation demonstrated by that study was the alteration in the subjective time sense of many of the participants from being relatively future-oriented college students to being totally immersed prisoners of the present moment, without concern for their shared past or any interest in the future after they were released. Growing up in poverty led Zimbardo to realize that his family and friends were prisoners of a fatalistic present. Education liberated him, and others, into a more future-oriented realm of existence.

Review of relevant research followed, along with conceptual analyses of the dynamic role that TP plays in everyday life decisions, goal setting, and actions. These early ventures were conducted with social psychologist Alex Gonzalez,

who added a cultural dimension to our views of TP differences. We conducted interviews and focus groups with students, colleagues, and staff at Stanford University and Fresno State University, as well as with noncollege populations. We did so to elicit representative propositions that seemed to characterize their personal beliefs, preferences, and particular experiences concerning variations in subjective TPs. A first empirical demonstration of the utility of a scale to measure such differences came from a convenience sample of more than 12,000 respondents to a Psychology Today questionnaire that we had prepared on the basis of our exploratory investigations (Gonzalez and Zimbardo 1985; Zimbardo and Gonzalez 1984). Because of magazine space limitations and our primary interest at that time in differences between present-oriented and future-oriented individuals, we did not include items that might have tapped into a past orientation. However, factor analysis revealed a number of distinct temporal factors within the present and future domains, along with interesting correlations with many occupations and other lifestyle variables. That first scale became the core for the scale described in this article. It has been continually refined according to the results of many studies and has been used to preselect participants for experimental research projects and correlational studies.

Refinement of the ZTPI was empirically driven, based on repeated factor analyses of the pool of statements thought to characterize different TPs. These items, collected from many different sources, reliably produced five distinct factors when factor analyzed. There was no a priori theoretical prediction of the number or characteristics of the factors that we would obtain; their nature was determined solely by the pool of characteristic statements and repeated factor analyses of this pool. After the stability of the five-factor structure had been established, individual items were analyzed and revised to maximize factor loadings and increase the internal consistency of the subscales. The final factor analysis reported in this article thus represents the end product of a multipronged approach to the development of the ZTPI spanning more than a decade.

The scale items represent propositions about individuals' beliefs, preferences, and values regarding experiences that are temporally based but are not descriptive of time-related demographic information (e.g., "I have lived, now live, will live, in city X"). The scale's five-factor structure and relative loadings were replicated recently in an independent test with samples of respondents from three very different colleges ($N=612$; variance explained, 34 %), with only minimal changes found in factor loadings of specific items (Holman and Zimbardo 1999).

Exploratory Factor Analysis

The ZTPI asks respondents to indicate how characteristic a statement is of them on a 5-point Likert scale ranging from very uncharacteristic (1) to very characteristic (5). Students from the College of San Mateo and Stanford University ($N=606$) completed the 56 items of the ZTPI either for class credit or to be eligible to win a

small cash prize. The Kaiser–Meyer–Olkin measure of sampling adequacy was .83 (see Table 1 for sample demographic characteristics).

Exploratory principal-components factor analysis (using varimax rotation and replacement of missing values with the mean) revealed five distinct TP factors that explained 36 % of the total variance (see Table 2). Inspection of both the scree plot and individual eigenvalues disclosed a precipitous drop in eigenvalues between the fifth and sixth factors. All items loaded above .30 on the first five factors, with an average loading of .45. The five latent constructs identified were theoretically viable

Table 1 Sample demographics

Characteristic	Sample						
	San Mateo[a]	Stanford[b]	Stanford[c]	Stanford[d]	SFSU[e]	Juvenile[f]	Interview[g]
n	205	79	224	99	361	38	28
Age range (years)	16–62	17–28	17–24	17–30	17–52	15–18	17–22
Main age (years)	23.6	19.1	18.8	19.2	19.4	16.5	18.6
Female (%)	65	57	57	52	61	24	56
Caucasian (%)	50	47	61	51	18	26	43
Asian American (%)	24	28	22	32	59	18	36
Hispanic (%)	14	11	9	1	11	32	7
African American (%)	2	8	4	11	5	18	7
Other ethnic background (%)	10	6	4	5	6	5	7

[a]College of San Mateo, introductory psychology classes, fall 1995
[b]Stanford University, introductory psychology class, winter 1996
[c]Stanford University, introductory psychology class, spring 1996
[d]Standford University, introductory psychology class, winter 1997
[e]San Francisco State University, introductory psychology class, spring 1996
[f]San Mateo County community schools, fall 1994
[g]Stanford University, introductory psychology students (18 from winter 1995 and 10 from fall 1995)

Table 2 Exploratory principal-components analysis: varimax-rotated factor matrix

ZTPI item	Past-Negative	Present-Hedonistic	Future	Past-Positive	Present-Fatalistic
1	.07	.42	−.02	.14	−.10
2	−.08	.18	.06	.62	.02
3	.24	.19	.09	.14	.44
4	.66	−.01	−.07	.05	.15
5	.41	.00	.02	.23	.13
6	.08	−.16	.46	.10	.02
7	−.25	.14	.01	.68	−.02
8	.03	.51	−.27	−.10	.05
9	−.09	.21	−.33	−.08	.12
10	−.16	.13	.56	−.03	−.09
11	−.41	.06	.03	.63	−.12
12	.09	.32	−.04	.13	.22

(continued)

Table 2 (continued)

ZTPI item	Past-Negative	Present-Hedonistic	Future	Past-Positive	Present-Fatalistic
13	−.08	−.17	.63	.04	.10
14	.10	.04	−.15	−.07	.64
15	.18	.09	.09	.63	.06
16	.69	.16	−.01	−.18	.06
17	−.20	.50	.19	.11	−.06
18	.11	.04	.48	−.06	−.04
19	.05	.38	.12	.10	.07
20	−.24	.24	.11	.64	−.03
21	−.12	.04	.46	.17	−.04
22	.49	.24	.07	−.20	−.04
23	.07	.51	−.25	−.12	.13
24	.06	.28	−.49	−.11	.20
25	.55	−.02	.02	−.52	.21
26	.05	.56	.05	.13	−.14
27	55	.03	−.18	.05	.02
23	.00	.36	−.30	.06	33
29	.04	.06	−.02	.64	.21
30	.00	.03	.37	.16	−.29
31	−.00	.70	−.02	−.00	.03
32	−.13	45	−.08	.08	.15
33	.43	.04	−.17	−.08	.29
34	.67	−.01	.05	−.25	.07
35	.20	.16	−.20	−.09	.42
36	47	.08	.06	.24	.21
37	.14	.17	−.12	−.04	.59
38	.17	−.02	.06	.02	.73
35	.04	−.02	−.01	−.10	.68
40	−.17	−.02	.61	−.01	.04
41	−.00	.00	−.00	−.45	.25
42	.00	.71	−.01	−.04	.08
43	−.05	.07	.45	.07	−.05
44	.18	.45	−.10	.07	.12
45	−.16	−.09	.61	−.06	−.06
46	.16	.44	−.22	.23	.10
47	.20	−.09	−.00	.09	.42
48	−.04	.45	−.16	−.10	.13
49	.10	−.06	.11	.47	−.03
50	.70	.06	.06	−.08	.05
51	.09	−.07	.53	.01	−.08
52	−.05	.28	−.18	−.04	.34
53	.08	.14	−.11	.02	.45
54	.63	−.07	−.13	.01	.21
55	.20	.44	−.00	.07	−.02
56	−.11	29	−.36	.09	.10

Note: ZTPI = Zimbardo Time Perspective Inventory

and were similar to those obtained in our earlier analyses. Two items, Items 11 and 25, loaded significantly on two factors but in opposite directions.[2] Both of these items were retained on the factor that was most theoretically justifiable.

Confirmatory Factor Analysis

Confirmatory factor analysis was performed (via maximum-likelihood estimation) on data from a new sample of San Francisco State University students ($N=361$). The model tested was based on the factor loadings of the exploratory analysis in which the items were driven by five latent TP constructs. All of the items had a significant relationship with the latent factor on which they were expected to load, and all but two items had a standardized loading above .30. Item 9 loaded at $-.26$, and Item 30 loaded at .29. We retained these two items because they added theoretical breadth to the factors and because deleting them did not significantly alter the factor structure. Because chi-square critical values are sensitive to degrees of freedom and the large number of degrees of freedom in our model (1,480), traditional goodness-of-fit indexes were not an appropriate test of our model's fit (see Pratte et al. 1994). Therefore, we resorted to an alternative method based on the relative chi-square value, which uses the ratio of χ^2/df (Carmines and McIver 1981).[3] Our χ^2/df ratio was 2.30 (3,398.73/1,480), which is within the acceptable ranges and suggests that the data are consistent with our model in which TP is represented by five latent factors.[4] (See the Appendix for the complete ZTPI scale.) The nature of each factor is described next.

The Five ZTPI Factors

Past-Negative

The first factor of the ZTPI, Past-Negative, reflects a generally negative, aversive view of the past (eigenvalue$=6.86$; 12.3 % of variance explained; $n=10$; $M=2.98$, $SD=0.72$). Items that compose this factor include "I think about the bad things that have happened to me in the past," "I think about the good things that I have missed

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[2] Both items loaded significantly on the Past-Negative and Past-Positive factors. They were retained on the Past-Positive scale on the basis of theoretical considerations, previous factor analyses of the scale, and a desire to increase the internal reliability of the scale.

[3] Although there are no clear criteria for interpreting this ratio, several researchers have proposed standards. Wheaton et al. (1977) suggested that a ratio of approximately 5 is acceptable when the sample size approaches 1,000 and that a ratio of 10 can be considered a good fit, and Carmines and McIver (1981) suggested that a ratio in the range of 2–3 is adequate.

[4] This was after allowing six pairs of factors to covary and freeing two off-diagonal elements of the theta–delta matrix. The items freed were 2 and 23, along with 31 and 42.

out on in my life," and "I often think of what I should have done differently in my life." Because of the reconstructive nature of the past, these negative attitudes may be due to actual experiences of unpleasant or traumatic events, to negative reconstruction of benign events, or to a mix of both. However, it seems reasonable to assume that the surprising prominence of this first strong factor is greater in the current United States cultural context in which the false memory syndrome–repressed memory controversy is publicized prominently and posttraumatic stress disorder is reported frequently in the media.

Significant ethnic differences were found, $F(4, 559) = 8.50$, $p < .01$, $\eta^2 = .06$. African Americans scored highest on the Past-Negative scale ($M = 3.20$, $SD = 0.75$), followed by Asians ($M = 3.10$, $SD = 0.69$), those of "other" ethnic backgrounds ($M = 3.10$, $SD = 0.73$), Hispanics ($M = 3.10$, $SD = 0.67$), and Caucasians ($M = 2.80$, $SD = 0.69$). Cronbach's alpha coefficient was .82.

Present-Hedonistic

The second factor, Present-Hedonistic, reflects a hedonistic, risk-taking, "devil may care" attitude toward time and life (eigenvalue = 5.01; 8.9 % of variance explained; $n = 15$; $M = 3.44$, $SD = 0.51$). It includes such diverse items as "Taking risks keeps my life from becoming boring," "I do things impulsively," "I often follow my heart more than my head," and "When listening to my favorite music, I often lose all track of time." It suggests an orientation toward present pleasure with little concern for future consequences. Cronbach's alpha coefficient was .79.

Future

The third factor reflects a general future orientation (eigenvalue = 3.54; 6.3 % of variance explained; $n = 13$; $M = 3.47$, $SD = 0.54$). Items typical of the Future factor include "I am able to resist temptations when I know that there is work to be done," "It upsets me to be late for appointments," "I complete projects on time by making steady progress," and (negatively) "I take each day as it is rather than try to plan it out." The Future scale suggests that behavior is dominated by a striving for future goals and rewards. Women scored significantly higher than men, $F(1, 585) = 16.20$, $p < .01$, $\eta^2 = .03$ (women, $M = 3.54$, $SD = 0.51$; men, $M = 3.36$, $SD = 0.51$). Cronbach's alpha coefficient was .77. (We were surprised that the Future factor did not decompose into several subfactors as had been found earlier (Gonzalez and Zimbardo 1985). However, that earlier sample included many older respondents in business and noncollege occupations whose future representations included their children, retirement, legacy, and other long-term factors not common in the thoughts of college students.)

Past-Positive

The fourth factor reflects an attitude toward the past that is very different from that captured by the first factor (eigenvalue $=2.50$; 4.5 % of variance explained; $n=9$; $M=3.71$, $SD=0.64$). Whereas the first factor suggests trauma, pain, and regret, the Past-Positive factor reflects a warm, sentimental attitude toward the past. Items that load on the Past-Positive factor include "It gives me pleasure to think about the past," "I get nostalgic about my childhood," "I enjoy stories about how things used to be in the 'good old times,'" and "I like family rituals and traditions that are regularly repeated." Significant ethnic, $F(4, 559)=3.80$, $p<.01$, $\eta^2=.03$, and gender, $F(1, 585)=5.20$, $p<.05$, $\eta^2=.01$, differences were found on the Past-Positive scale. Caucasians scored highest ($M=3.80$, $SD=0.62$), followed by Hispanics ($M=3.80$, $SD=0.63$), African Americans ($M=3.70$, $SD=0.79$), Asians ($M=3.60$, $SD=0.59$), and those of other ethnic backgrounds ($M=3.40$, $SD=0.77$). Women ($M=3.70$, $SD=0.66$) scored higher than men ($M=3.60$, $SD=0.60$). Cronbach's alpha coefficient was .80.

Present-Fatalistic

The fifth and final factor of the ZTPI reveals a fatalistic, helpless, and hopeless attitude toward the future and life (eigenvalue $=2.21$; 3.9 % of variance explained; $n=9$; $M=2.37$, $SD=0.60$). Items that compose the Present-Fatalistic factor include "My life path is controlled by forces I cannot influence," "You can't really plan for the future because things change so much," and "Often luck pays off better than hard work." Significant ethnic differences were found, $F(4, 559)=4.46$, $p<.01$, $\eta^2=.03$. Asians scored highest ($M=2.60$, $SD=0.60$), followed by Hispanics ($M=2.50$, $SD=0.67$), those of other ethnic backgrounds ($M=2.40$, $SD=0.63$), Caucasians ($M=2.30$, $SD=0.55$), and African Americans ($M=2.20$, $SD=0.53$). Cronbach's alpha coefficient was .74.

Test–Retest Reliability

Test–retest reliabilities of the five subscales of the ZTPI were established with 58 Stanford introductory psychology students over a 4-week period. Reliabilities ranged from .70 to .80. The Future scale demonstrated the best test–retest reliability (.80), followed by Present-Fatalistic (.76), Past-Positive (.76), Present-Hedonistic (.72), and Past-Negative (.70). All correlations were significant at $p<.01$ (see Table 3 for intercorrelations between the factors).

Table 3 Intercorrelations between Zimbardo Time Perspective Inventory factors: samples 1–4 ($n = 606$)

Factor	1	2	3	4	5
1. Past-Negative	–				
2. Present-Hedonistic	.16***	–			
3. Future	−.13**	−.29***	–		
4. Past-Positive	−.24***	.18***	.12**	–	
5. Present-Fatalistic	.38***	.32***	−.26***	−.09*	–

*$p < .05$; **$p < .01$; ***$p < .001$

Convergent and Discriminant Validity

Having established the factor structure, test–retest reliability, and internal consistency of the ZTPI, we turn to issues of validity. As with the basic scale construction process, validation was complicated by the nature of this ephemeral but pervasive phenomenon. Time permeates and defines people's existence, so much so that it can be related to many diverse psychological constructs. Any attempt at validation, therefore, must include numerous psychological measures that conceptually might be related to any of our five TP factors. We next demonstrate the relationships of each of our scale factors with a network of traditional measures assumed to share some common variance with them. Our analyses reveal the unique contribution of our five temporal factors within the correlational structure existing between them and a dozen traditional measures.

Method

Evidence of convergent validity comes from support of hypotheses relating various established psychological constructs to each of the five subscales of the ZTPI. For evidence of divergent or discriminant validity, we hypothesized that subscales of the ZTPI would not be associated (or would be only weakly associated) with psychological constructs for which we did not make a prediction of convergent validity. After identifying relevant constructs from a literature review, we administered the appropriate scales along with the ZTPI to a subset of the participants in our first study. Space considerations do not allow us to detail all of the hypotheses we considered, so we focus on those we consider most important for the basic validation of our scale. It is important to note the wide range of diverse constructs that we believed were conceptually related to each of our TP factors. Moreover, it is equally interesting to highlight the many and varied constructs with which our TP factors overlap both empirically and conceptually.

Participants

Introductory psychology students from the College of San Mateo ($N=205$) participated in exchange for an opportunity to win cash prizes (see Table 1 for demographic characteristics). They completed a large set of 12 established scales, questionnaires and inventories, self-report items, and demographic measures, in addition to the ZTPI.

Materials

Aggression Questionnaire

The Buss and Perry Aggression Questionnaire (1992) contains four subscales that measure physical aggression, verbal aggression, anger, and hostility. The mean score for our sample was 2.63 ($SD=0.57$), men ($M=2.78$, $SD=0.59$) scoring significantly higher than women ($M=2.55$, $SD=0.56$), $t(196)=\eta^2.68$, $p<.01$. The alpha coefficient was .90.

Beck Depression Inventory

This scale (Beck et al. 1961) assesses the degree of negative cognitions associated with depression during the previous week. The average score in our sample was 5.77 ($SD=5.61$), and the alpha coefficient was .84.

Conscientiousness

The conscientiousness scale is a subscale of the Big Five Questionnaire (Caprara et al. 1993).[5] It has two facets: scrupulousness and perseverance. The scrupulousness facet measures dependability, orderliness, and precision, whereas the perseverance facet measures ability and motivation to fulfill one's tasks and commitments. The average score was 3.50 ($SD=0.42$), women ($M=3.55$, $SD=0.41$) scoring significantly higher than men ($M=3.40$, $SD=0.42$), $t(199)=2.29$, $p<.05$. The alpha coefficient was .79.

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[5] Although specific predictions were made only for two of the Big Five Questionnaire factors, correlations with all five factors are presented in Table 4. TP correlations with the three factors for which predictions were not made suggest that TP, as measured by the ZTPI, is not strongly related to these factors. The strongest correlation between a ZTPI factor and one of these three factors for which no predictions were made was .30.

Consideration of Future Consequences Scale

This instrument (Strathman et al. 1994, p. 742) measures a "stable individual difference in the extent to which people consider distant versus immediate consequences of potential behaviors." The average score for this 12-item scale was 3.41 (*SD* = 0.57), and the alpha coefficient was .78.

Ego-Control Scale (VI)

This scale (Block and Kremen 1996) has 38 items rated as to how true they are for the respondent. The scale is scored for undercontrol. The mean score was 2.57 (*SD* = 0.30). The alpha coefficient was .80.

Impulse Control

The impulse control scale of the Big Five Questionnaire (Caprara et al. 1993) assesses one's ability to control irritation, discontent, and anger. The average score was 2.84 (*SD* = 0.52), and the alpha coefficient was .72.

Novelty Seeking

This measure (Cloninger 1987) is a subscale of the Tridimensional Personality Questionnaire, which assesses three basic personality dimensions: novelty seeking, harm avoidance, and reward dependence. The novelty seeking scale measures "a tendency to be attracted to unfamiliar stimuli and is characterized by frequent exploratory activity and the avoidance of monotony" (Sher et al. 1995, p. 195). The average score (summing all of the true statements of the 34 that participants judged as true or false about themselves) was 17.93 (*SD* = 5.73). The alpha coefficient was .79.

Preference for Consistency Scale

This scale (Cialdini et al. 1995; brief form) measures "a tendency to base one's responses to incoming stimuli on the implications of … previous expectancies, commitments, and choices" (p. 318). The average score was 5.61 (*SD* = 1.28), and the alpha coefficient was .81.

Reward Dependence

This scale (Cloninger 1987) is a subscale of the Tridimensional Personality Questionnaire. Conceptually similar to delay of gratification, it measures "extreme sensitivity to reward cues, particularly social approval, and greater resistance to extinction of behavior" (Sher et al. 1995, p. 195). The personally relevant truth or falsity of each of 30 statements is rated. The average score in our sample (summing

all of the true statements) was 19.94 ($SD=4.31$), women ($M=20.83$, $SD=3.98$) scoring significantly higher than men ($M=18.13$, $SD=4.38$), $t(200)=4.45$, $p<.01$. The alpha coefficient was .71.

Rosenberg Self-Esteem Scale

The 10 items of this scale (Rosenberg 1965) assess the degree of one's perceived self-esteem. The average score was 4.0 ($SD=.74$). Men ($M=4.2$, $SD=0.68$) scored significantly higher than women ($M=3.9$, $SD=0.76$), $F(1, 301)=7.0$, $p<.01$, $\eta^2=.02$. The alpha coefficient was .90.

Sensation-Seeking Scale

The 40 items of this scale (Zuckerman 1994; Zuckerman et al. 1978) describe individuals' preferences regarding seeking sensation and excitement. The average score in our sample was 59.2 ($SD=6.4$), men ($M=60.3$, $SD=6.2$) scoring marginally higher than women ($M=58.6$, $SD=6.4$), $F(1, 200)=3.1$, $p=.08$; $\eta^2=.01$. The alpha coefficient was .79.

State-Trait Anxiety Inventory

The 20 items of this instrument (Spielberger et al. 1970) measure either state or trait anxiety. We used the trait version, which measures relatively stable individual differences between people in their tendency to respond with anxiety to situations perceived as threatening. The average score was 2.12 ($SD=0.47$), and the alpha coefficient was .89.

Self-Report and Demographic Questions

Several self-report and demographic items were also included in the surveys: grade point average (GPA), hours studied per week, creativity, happiness, lying, and shyness. These single self-report items obviously do not have the reliability of the other established scales. Nevertheless, we expected them to be related to our ZTPI factors, and, if so, they could provide useful information for future research.

Results

Support for the validity of the ZTPI comes from the general pattern of results, which is quite consistent with our theory and hypotheses. Predictions involving specific constructs and facets of TP are discussed subsequently. Correlations were corrected for attenuation (taking account of the reliability of each scale; for a complete set of correlations, see Tables 4 and 5).

Table 4 Convergent and discriminant validity: Zimbardo Time Perspective Inventory correlations ($n = 205$)

Scale	Past-Negative	Present-Hedonistic	Future	Past-Positive	Present-Fatalistic
Aggression	.49***	.29***	−.31***	−.16***	.39***
Depression	.59***	.20**	−.19**	−.17*	.37***
Energy	−.18**	.27***	.30***	.15**	−.21***
Friendliness	−.11*	.05	.04	.22***	−.08
Conscientiousness	−.11*	−.20***	.57***	.04	−.22***
Emotional stability	−.45***	−.19***	.06	.08	−.19***
Openness	−.10	.05	.11*	−.01	−.19***
Consideration of future consequences	−.19**	−.31***	.52***	.02	−.55**
Ego control	.26***	.60***	−.39***	−.04	.29***
Impulse control	−.34***	−.25***	.29***	−.01	.23**
Novelty seeking	.29***	.57***	−.41***	−.03	.28***
Preference for consistency	−.10	−.41***	.47***	.09	−.16*
Reward dependence	.01	−.01	.37***	.18*	−.13
Self-esteem[a]	−.48***	.11	.13*	.28***	−.28***
Sensation seeking	.05	.57***	−.31***	−.05	.17*
Trait anxiety	.62***	.07	−.14*	−.25***	.38***

[a]Samples 4 and 5 ($n = 312$)

*$p < .05$; **$p < .01$; ***$p < .001$

Table 5 Zimbardo Time Perspective Inventory and Single Self-Report Item correlations: College of San Mateo and San Francisco State University data ($n = 566$)

Characteristic	Past-Negative	Present-Hedonistic	Future	Past-Positive	Present-Fatalistic
Age	−.08	−.10*	.23***	.01	−.08*
Grade point average	−.05	−.07	.21***	.07	−.08*
Hours of studying per week	.06	−.15**	.28***	.01	.02
Level of creativity	−.06	.28***	.09*	.13***	−.11*
Level of happiness	−.41***	.16***	.01	.36***	−.23***
Frequency of stealing	.12*	.16**	−.02	.04	.13*
Frequency of lying	.18***	.16***	−.20***	.03	.17***
Level of shyness	.20***	−.16**	.00	−.13**	.13**
Temper	.18***	.05	−.08	−.06	.18***

*$p < .05$; **$p < .01$; ***$p < .001$

Past-Negative

This factor embodies a pessimistic, negative, or aversive attitude toward the past. Previous research has shown that negative rumination is associated with depression (Lyubomirsky and Nolen-Hoeksema 1995; Nolen-Hoeksema and Morrow 1993). Therefore, Past-Negative scores were predicted to be associated with depression,

anxiety, unhappiness, and low self-esteem. As predicted, Past-Negative score was significantly associated with depression, $r(203) = .69$, $p < .01$; anxiety, $r(205) = .73$, $p < .02$; self-reported unhappiness, $r(205) = -.41$, $p < .01$; and low self-esteem, $r(312) = -.56$, $p < .01$.[6] An additional, unexpected finding was the strong relationship between Past-Negative scores and aggression, $r(200) = .57$, $p < .01$.

Evidence for discriminant validity was provided by null relationships with reward dependence and sensation seeking. Reward dependence was predicted—and found—to be strongly associated with scores on the Future scale, and sensation seeking was associated with scores on the Present-Hedonistic scale.

Present-Hedonistic

This factor is characterized by an orientation toward present enjoyment, pleasure, and excitement, without sacrifices today for rewards tomorrow. Accordingly, we hypothesized that high scores on this scale would be associated with a lack of consideration of future consequences, a low preference for consistency, a low ego or impulse control, and an emphasis on novelty and sensation seeking. These predictions were validated; robust correlations emerged with ego undercontrol, $r(205) = .75$, $p < .01$; novelty seeking, $r(204) = .72$, $p < .01$; sensation seeking, $r(205) = .72$, $p < .01$; and (negatively) preference for consistency, $r(205) = -.51$, $p < .01$. In contrast to these predicted strong correlations, the scale did not correlate significantly with any of the past-oriented or future-oriented constructs, such as reward dependence and anxiety, and negatively with the self-report shyness item.[7]

Future

This factor is characterized by planning for and achievement of future goals. Predicted relations were thus expected with consideration of future consequences, conscientiousness, preference for consistency, and reward dependence, along with low levels of novelty and sensation seeking. We also expected Future scores to be negatively associated with behaviors that might jeopardize future goals, such as aggression, ego undercontrol, impulsivity, and risk taking. Indeed, as predicted, the Future factor correlated significantly with conscientiousness, $r(205) = .73$, $p < .01$; consideration of future consequences, $r(205) = .67$, $p < .01$; preference for consistency, $r(205) = .59$, $p < .01$; and the self-report item regarding hours spent studying per week, $r(205) = .28$, $p < .01$. As expected, it also correlated negatively with novelty seeking, $r(204) = -.53$, $p < .01$, and sensation seeking, $r(205) = -.40$, $p < .01$, and it correlated weakly with anxiety, $r(205) = -.17$, $p < .05$, and depression, $r(203) = -.24$, $p < .01$. It was unrelated to aggression.

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[6] Self-esteem data are from Samples 4 and 5 (see Table 1).

[7] The sample size was smaller because participants who reported that they were "not shy" in preceding questions did not respond to the "how shy" question.

Past-Positive

This factor is characterized by a glowing, nostalgic, positive construction of the past. Its opposition to the Past-Negative factor should lead to negative associations with all of the behaviors typical of those high on the Past-Negative factor. High scorers on this factor were predicted to be low in depression and anxiety but high in self-esteem and happiness. This factor taps a healthy outlook on life, in contrast with the potentially pathological focus of high scorers on the Present-Fatalistic and Past-Negative scales. As expected, it correlated significantly and negatively with aggression, $r(200)=-.19$, $p<.05$; depression, $r(203)=-.20$, $p<.05$; and anxiety, $r(205)=-.30$, $p<.01$. Each of these correlations was opposite to that found for the Past-Negative factor. The factor also correlated significantly with self-esteem, $r(315)=.33$, $p<.01$ (see Table 1, sample Stanford[c]). It did not correlate significantly with present-oriented or future-oriented constructs such as novelty seeking, sensation seeking, and preference for consistency.

Present-Fatalistic

This factor reflects the absence of a focused TP. It lacks the goal focus of future-oriented individuals, the emphasis on excitement of hedonists, and the nostalgia or bitterness of those high on the two past factors. Instead, it reveals a belief that the future is predestined and uninfluenced by individual actions, whereas the present must be borne with resignation because humans are at the whimsical mercy of "fate." Such individuals should score high on measures of depression and anxiety. In addition, their perceived lack of control over future events should show up in a negative relationship with consideration of future consequences. As predicted, this factor correlated significantly and strongly with aggression, $r(200)=.48$, $p<.01$; anxiety, $r(205)=.47$, $p<.01$; and depression, $r(203)=.45$, $p<.01$. It correlated negatively with consideration of future consequences, $r(205)=-.72$, $p<.01$. It did not correlate significantly with future-oriented constructs such as reward dependence.

Supporting External Validation Studies

Next, we report an additional study by independent investigators, which used the ZTPI with other constructs, that provides further external validation. We also include here some relevant research from our own TP research program.

The Big Five Questionnaire

A recent study by independent investigators found discriminating patterns of correlation between our ZTPI factors and the five dimensions of the Big Five Questionnaire (Goldberg and Maslach 1996). For example, the Present-Hedonistic

factor correlated positively and significantly with energy but negatively with conscientiousness and emotional stability. The Future factor correlated very strongly with conscientiousness as well as energy. The Present-Fatalistic factor correlated negatively with energy, conscientiousness, openness, and emotional stability. The Past-Positive factor correlated positively with energy and agreeableness, whereas the Past-Negative factor was related significantly but negatively to emotional stability, energy, conscientiousness, and agreeableness (see Table 4 for a complete list of correlations).

Risk Taking and Substance Use

In two large-scale companion studies (N = >2,600), present TP was highly related to risky driving (Zimbardo et al. 1997) and also to more frequent smoking, consumption of alcohol, and drug use (Keough et al. 1999). Risky driving included driving fast, driving under the influence of alcohol, riding bikes without mandatory helmets, and taking risks that might result in crashes and accidents. Substance use included heavy drinking as well as smoking and taking drugs. These socially significant results were obtained across 15 diverse samples (college and high school students and driving school adults), with several independent replications. TP remained an independent predictor of risk and substance use even after controlling for the effects of many of the personality measures previously reported as associated with these classes of outcome measures. In addition, the strongly positive correlations between present TP and each of the risk and substance use variables contrast with their weakly negative associations to Future TP. That contrast speaks to the relative independence of these temporal factors and to the caution against assuming that low values of one of these factors imply high values of the other factor. In a later section, we present additional research showing the predictive utility of the ZTPI for other health risk behaviors.

Additional Tests of Discriminant Validity

A potential criticism of the ZTPI is that it does nothing more than serve as "a new bottle for old wines." That damaging view would be supported if there was evidence that the strong correlations obtained between our time scale and traditional psychological constructs are tapping the same underlying psychological dimensions with little added value provided by the ZTPI. To assess this hypothesis, we examined in depth two very robust correlations between different ZTPI factors and established psychological constructs: depression and conscientiousness. Our data were subjected to a special statistical evaluation to determine whether these variables and the relevant ZTPI factors, Past-Negative and Future, were tapping into a common shared dimension or whether the ZTPI maintained conceptual and empirical independence despite the surface correlations.

The Past-Negative subscale of the ZTPI correlated (disattenuated for measurement error) highly with the depression scale at .69, whereas our Future subscale correlated with the Big Five Questionnaire conscientiousness scale at a solid .73. We used these relationships as a test case for the discriminant validity of the ZTPI by separately factor analyzing each of our scales with the relevant personality scale.

As a means of investigating the possibility that the first pairing was measuring the same construct, first all ZTPI items and then the items from the depression scale were factor analyzed together via varimax rotation (replacing missing values with the mean). The solution was constrained to six factors, which explained 36 % of the variance. Factor 1 (13 % of the variance) appeared to be the "depression" factor. All of the items from the depression scale loaded on this factor at greater than .30 (average loading of .55). None of the depression items loaded above .3 on any other factor. Seven items from the ZTPI Past-Negative subscale also loaded above .3 on this first factor (average loading of .31). Five of these seven items, however, loaded higher on Factor 6. The two items from the ZTPI Past-Negative subscale that loaded more highly on the "depression" factor were "It's hard for me to forget unpleasant images of my youth" and "I think about the good things that I have missed out on in my life." Both suggest depressive rumination. Factor 6, which accounted for 3 % of the variance, appeared to be the "Past-Negative" factor, because 8 of the 12 items from the ZTPI Past-Negative subscale loaded above .3 on this factor (average loading of .38). None of the depression scale items loaded above .3 on Factor 6 (average loading of .09).

Factor loadings were standardized, and then mean factor loadings for Factors 1 and 6 were compared with the scale from which the items were taken. Analysis of variance revealed that there was a significant interaction between the scale from which an item was taken and its factor loading, $F(1, 48) = 84.5$, $p < .01$. Items from the ZTPI Past-Negative scale loaded significantly higher on Factor 6, whereas depression items loaded significantly higher on Factor 1. It seems reasonable to conclude, then, that although the Past-Negative subscale of the ZTPI and depression are strongly correlated, they remain distinct and not entirely overlapping constructs.

As a means of investigating the possibility that the ZTPI Future subscale might be isomorphic with the content of the conscientiousness scale, items from the latter were factor analyzed with all items from the ZTPI. The varimax rotation (missing values replaced with the mean) constrained the solution to six factors (34 % of the variance). Factor 1 appeared to be the "Future" factor, and it accounted for 12 % of the variance. Of the 15 items of the ZTPI Future subscale, 12 had loadings above .30 on this first factor (average loading, .40). Thirteen of the 24 items of the conscientiousness scale also loaded above .30 on the first factor, with an average loading of .15. However, no clear "conscientiousness" factor emerged, making comparison of mean factor loadings less meaningful. Eight conscientiousness items loaded above .3 on Factor 1, six loaded above .3 on Factor 4, and seven loaded above .3 on Factor 6. Three of the 24 conscientiousness scale items failed to load above .3 on any factor. Items from the Future subscale that loaded above .30 on factors other than Factor 1 and Factor 6 were reversals of their earlier loading direction

that made sense in this setting. The item that loaded (.34) on Factor 3, the "Present-Hedonistic" factor, was "I feel that it's more important to enjoy what you're doing than to get work done on time." This item had previously loaded negatively on the Future subscale of the ZTPI. The item that loaded on Factor 4 (at .47), the "Present-Fatalistic" factor, was "It takes the joy out of the process and flow of my activities, if I have to think about goals, outcomes, and products." Again, this item had previously loaded negatively on our Future subscale. The items that loaded on Factor 6 (at .36), the "conscientiousness-mixed" factor, was "I believe that a person's day should be planned ahead each morning." This item had previously loaded positively on the Future subscale.

These results were interpreted as providing evidence of discriminant validity for the Past-Negative and Future subscales of the ZTPI. Past-negative TP and the depression scale were highly correlated with depression, a highly consistent construct that explains a larger portion of the variance. However, Past-Negative remained a distinct factor, with items from the depression scale loading significantly higher on the "depression" factor than Past-Negative items. The reverse was true for items from the Past-Negative subscale, which loaded significantly higher on the "Past-Negative" factor than did the depression items.

In the case of Future TP and conscientiousness, the evidence more strongly supports the discriminant validity of the ZTPI. Although the items from the conscientiousness scale do not form a coherent factor, the items from the Future subscale of the ZTPI do. The Future factor appears more coherent and explains more variance than does the conscientiousness scale.

This overall pattern of results is clearly consistent with our theory that TP is a fundamental psychological dimension from which more complex psychological constructs may emerge and to which more complex psychological constructs may be related. We arbitrarily selected two of the more robust correlations between our new scale and established scales as test cases for the assertion that the ZTPI is but a new instrument for replaying old tunes. That is not the case here, nor do we believe it would be so with similar analyses applied to the other time factors. Thus, we can assert with greater confidence that although the subscales of the ZTPI correlate with a variety of predicted psychological constructs, they maintain their conceptual independence and coherence as explanatory constructs. And, as shown next, they also have predictive utility of considerable value.

Discussion

The results of our validation study, supplemented by independent investigations, give us confidence in the ZTPI as an individual-differences metric that assesses fundamental dimensions of the human condition. We have shown that it is related in significant ways to many established psychological concepts, as we had predicted, with an encouraging breadth and robustness of the obtained relationships. Because each of our subscales correlated with diverse measures that do not appear to assess

identical concepts, we may begin to uncover commonalities among these important psychological constructs using TP as an integrating and analytic process. Doing so may help explain the temporal basis of some of these relationships, such as that between anxiety and depression, and may also guide the development of future psychological constructs.

Studies of Predictive Validity

The final step in evaluating the usefulness of this new psychological measure is to demonstrate its predictive validity. Does it enable predictions of a range of significant outcomes based on predictor scores on each of the subscales, in addition to their simultaneous correlations? The main study presented next as an affirmative answer to that question used in-depth case study interviews and observations of participants selected as high on each one of the five ZTPI factors. Further supportive evidence of the predictive utility of the ZTPI is then presented through brief reports on several health-relevant experiments involving college students and cancer survivors, on high-risk sexual behaviors of female prisoners, on sleep and dreaming disorders, and on the influence of roles and status on TP among classes of military academy personnel. Included is an interesting study showing that students' decisions as to when during the school term to sign up for participation in experiments are predicted by whether they are present or future oriented. These results suggest a systematic, unrecognized potential biasing effect on experimental data collected at different points of the school term. Finally, predictive utility is shown further in a recent study relating TP to coping strategies of homeless people.

Time Perspective Case Studies

This validation of the ZTPI is by means of intensive case study research. The predictive validity of the ZTPI is demonstrated across a wide range of behaviors that were assessed through in-depth interviews with individuals who had previously scored high on one of the five factors of our measure.

Method

Participants

Introductory psychology students at Stanford University who scored above the 95th percentile on one of the ZTPI factors, but below the 95th percentile on the other four factors ($N=31$), were individually invited (and paid) to participate in a research

project involving a personal interview. Participants were selected to represent nearly equal numbers of each TP factor, and they were randomly and individually assigned to each of 31 separate interviewers who remained unaware of the TP bias of their interviewee until after submitting their case reports.

TP Semistructured Interview

A semistructured interview was designed to associate a wide range of specific behaviors with specific TPs (in collaboration with a TP research group consisting of graduate and honor students). The interview was formulated to generate a behavioral profile predictive of a "typical" high scorer on each subscale. The interview included sections on general background, friendships, romantic relationships, personal items, risk taking, significant life events, academics, typical day, stress, money, expected longevity, life goals, spirituality, health, and sexuality. (Copies of the interview are available on request.)

Procedure

Thirty-one trained interviewers, members of the TP research group and undergraduates in a TP seminar, interviewed the 31 preselected students individually during a long session that averaged 87 min. The interviews were conducted in students' dormitory rooms to facilitate their being at ease and to enable the interviewer to record aspects of the room. All interviews were typed, according to a prearranged scoring format, and then scored independently by two trained judges and reviewed by a third. Only data on which there was agreement between two of the three raters were included. The results of the 31 case studies are pooled here, and only significant results are presented. These individual interviews were gathered about 2 months after the ZTPI scale had been administered in a large-group setting.

Results

Although unaware of the TP factor bias of the participants, 14 of 31 interviewers correctly identified the TP for which their interviewee had been selected, $\chi^2 (1) = 12.3$, $p < .01$. This is particularly impressive given that our Stanford student population probably had a more restricted range of TP than the general population and that some participants were also relatively high on some of the other four factors (but less than 95 %). In general, the characteristics of these participants were as we had predicted. For brevity, we summarize the major results in terms of a characteristic profile for each of the ZTPI factor "types." Because of the relatively small sample size for each subscale, we are taking the liberty of reporting statistical findings in predicted directions that exceed traditional significance values.

Past-Negative

Those scoring high on this factor present a potentially disturbing portrait. In general, their interpersonal relationships are minimal and unsatisfactory, and they are not motivated to work for future rewards. They reported having fewer close friends both at Stanford, $r(30)=-.40$, $p<.05$, and elsewhere, $r(30)=-.38$, $p<.05$. When asked whether their significant life events involved people, experiences, or both people and experiences, those who reported "people" most frequently were likely to be the high-scoring Past-Negative respondents $F(2, 27)=5.00$, $p<.05$, $\eta^2=.27$. They also exercised less but liked gambling more than did those in the other TP groups: exercising regularly, $F(3, 23)=2.80$, $p<.10$, $\eta^2=.27$, and feelings toward gambling, $F(2, 27)=2.70$, $p<.10$, $\eta^2=.17$. Past-negative TP individuals were less likely to have had sex than their peers in the other TP groupings. The 60 % of this total sample who had not had sex scored higher on the Past-Negative scale, $F(1, 26)=3.90$, $p<.10$, $\eta^2=.13$. In general, there were few aspects of their current life in which they reported taking pleasure.

Present-Hedonistic

The picture of highly Present-Hedonistic students was well predicted by our earlier-reported data and TP theory. Interviewers clearly believed that these respondents were living for pleasure today with little regard for tomorrow. They used alcohol more, had unclear future goals, were not religious, and did not wear wristwatches, and more of them had parents who had divorced; however, they communicated with their families more often than students in the other TP categories. Specifically, those who used alcohol more often scored higher on the Present-Hedonistic scale than those who used alcohol less often, $F(2, 25)=2.60$, $p<.10$, $\eta^2=.18$. Individuals with less clearly defined future goals scored higher on this factor as well, $F(3, 26)=3.30$, $p<.05$, $\eta^2=.28$. The same was true for not being religious, $F(1, 26)=3.10$, $p<.10$, $\eta^2=.23$; not wearing a wristwatch, $F(1, 26)=4.10$, $p<.10$, $\eta^2=.14$; having divorced parents, $F(3, 25)=2.50$, $p<.10$, $\eta^2=.23$; and communicating with family more often, $r(29)=.40$, $p<.05$. These individuals also tended to be highly energetic, engaging in many activities and a wide variety of sports.

Future

Our interviews revealed that future-oriented TP students were highly organized, ambitious goal seekers who felt pressed for time but were willing to sacrifice present enjoyment to achieve their career objectives. They stood out from their peers on most dimensions of organizational planning and efficiency. Those scoring high on the Future scale were most likely to make "to-do" lists, $F(1, 27)=8.30$, $p<.01$,

$\eta^2 = .23$; use a day planner, $F(1, 28) = 9.20$, $p < .01$, $\eta^2 = .25$; wear a watch, $F(1, 27) = 3.90$, $p < .10$, $\eta^2 = .36$; and balance their checkbook, $F(3, 23) = 9.75$, $p < .01$, $\eta^2 = .56$. Similarly, those students reporting that they had more order and structure in their lives also scored higher on the Future subscale, $F(4, 26) = 5.80$, $p < .01$, $\eta^2 = .48$, and they had more clearly defined future goals, $F(3, 27) = 5.50$, $p < .01$, $\eta^2 = .38$.

This focus on organization in their lives may arise from a sense of "time crunch" and a need to use time wisely to fulfill the many tasks they engage in and to reach their high standards. Those highest on the Future factor were most likely to report the presence of stress, $F(1, 27) = 8.80$, $p < .01$, $\eta^2 = .25$, as well as a high degree of stress, $F(4, 26) = 3.30$, $p < .05$, $\eta^2 = .34$. They also reported pressure to use time efficiently, $F(1, 28) = 7.40$, $p < .05$, $\eta^2 = .21$, while simultaneously noting that they had little "free time" available in their current lives, $F(4, 26) = 6.20$, $p < .01$, $\eta^2 = .49$. However, the trade-offs for dealing with this pressured lifestyle derive from its rewarding consequences, because ambition, organization, striving, and stress result in higher GPAs, $r(27) = .40$, $p < .05$, and fewer course "incompletes," $r(30) = -.39$, $p < .05$, relative to classmates.

Another aspect of their eye on living for tomorrow and their self-centeredness was evident in reports about wanting to live to be older, $r(28) = .36$, $p < .10$; preferring nutrition over taste in selecting foods, $F(2, 25) = 3.20$, $p = .06$, $\eta^2 = .20$; and planning to have fewer children, $r(29) = -.41$, $p < .05$. But a significant cost that is packaged with this ambitious goal seeking for future-oriented individuals is the social deficit that is created by having no time to "waste" hanging out with friends or even making them in the first place. However, they imagine that it would be good to be able to do so, as shown by the result that those wishing they had more time to spend with their friends scored significantly higher on the Future scale, $F(1, 28) = 6.00$, $p < .05$, $\eta^2 = .18$.

Past-Positive

These high scorers who focus nostalgically on good times from the past are somewhat introverted, yet they get involved in relationships with friends and, in general, tend to act in ways that their parents would support as "better safe than sorry." High scorers on the Past-Positive scale were more likely to be shy, $F(1, 25) = 7.60$, $p < .05$, $\eta^2 = .23$; involved in a current relationship, $F(1, 28) = 6.59$, $p < .05$, $\eta^2 = .19$; and spiritual, $F(1, 27) = 4.30$, $p < .05$, $\eta^2 = .14$. They were also more likely to have married parents, $F(3, 26) = 2.80$, $p < .10$, $\eta^2 = .24$. Their cautious behavioral style stood in dramatic contrast with those scoring high on the Present-Hedonistic scale. They reported having had less sex, $F(1, 26) = 6.50$, $p < .05$, $\eta^2 = .20$, and those who had engaged in sex had fewer partners, $r(28) = -.42$, $p < .05$. Moreover, they consumed alcohol less often, $F(2, 26) = 3.10$, $p < .10$, $\eta^2 = .19$, and took fewer risks, $F(3, 27) = 3.40$, $p < .05$, $\eta^2 = .27$. Interviewers noted that these students were more likely to keep a clock prominently on their desks, $F(1, 28) = 3.50$, $p < .10$, $\eta^2 = .12$.

Present-Fatalistic

These students present a puzzling problem because they are intelligent young men and women living in a generally optimistic environment that encourages a sense of personal efficacy, yet they do not believe that anything they do, or will do, is likely to make a difference in their lives. More than any other group, they tended to be dissatisfied with their present life and did not think that it would improve. One manifest aspect of this negativity was their lower GPA, $r(27) = -.37$, $p < .10$. They did not wish that they had more time to spend with their friends, $F(1, 28) = 5.50$, $p < .05$, $\eta^2 = .16$. Perhaps most telling about the depth of the fatalism embraced by these students is the fact that they wanted to live shorter lives than did the other students we interviewed, $r(28) = -.46$, $p < .05$. They were also likely to have many sexual partners, with high Present-Fatalistic scores positively correlated with number of different sexual partners, $r(28) = .36$, $p < .10$. (Other data indicated that they were not likely to practice safe sex, and, with this promiscuity, one can predict that they will be overrepresented among those who contract sexually transmitted diseases and are at risk for HIV.)

Discussion

These interview results bolster our earlier validity findings while extending the vast array of behaviors that are influenced by the operation of TP biases. TP was related to such diverse behaviors and dispositions as wearing a watch, choice of food based on taste or nutrition, how long individuals want to live, sexual experiences, parental marital state, desire to spend more or less time with friends, risk taking, goal focus, grades, stress, perceived time pressures, shyness, and spirituality. Of course, we recognize that the small sample sizes in each of the cells of this case study limit the generalizability of our conclusions. Nevertheless, taken in aggregate with the earlier-reported data from large-scale studies, these results add breadth and depth to the emerging portrait of how major differences in temporal perspective may come to shape the thoughts, feelings, actions, and dispositional tendencies of many individuals. We next present research relating TP to important areas such as health and coping, sleep and dreaming, roles and status, and when during a school term students sign up to participate in experiments.

Health-Relevant Research

Several studies have examined health-related consequences of various TP biases, some from our laboratory and others conducted by independent investigators. A study of childhood cancer survivors ($N = 40$) randomly assigned participants to write about selected events in the past, present, or future over a 2-week period (Mann

et al. 1999). Future TP was positively correlated with optimism ($r=.35$, $p<.05$; Life Orientation Test; Scheier and Carver 1985). Optimists scored higher on future orientation ($M=3.80$) than did pessimists ($M=3.40$), $t(37)=2.91$, $p<.01$. Writing about the future led to significant increases in optimism ($M=10.6$ %, $z=2.08$, $p<.05$), writing about the present had no effect, and writing about the past decreased optimism, although not significantly so ($M=-2.7$ %). Pessimists were most helped by writing about the future; their optimism by 17 % relative to 3 % for the optimists, $t(13)=2.14$, $p<.05$.

An Italian study using our TP scale produced important health data regarding women who seek breast cancer screening and those who do not (Guarino et al. 1999). A group of 150 women was given an Italian translation of the ZTPI in the waiting room of a breast cancer clinic in a public hospital in Rome. An equal number of matched control women who did not participate in regular breast cancer screening were tested at their homes. Preliminary findings indicated that, as expected, women seeking breast cancer screening scored higher on the Future scale than the no screening controls, who in turn scored higher on the Present-Hedonistic scale.

Rothspan and Read (1996) used our ZTPI with a sample of 188 heterosexual college students to investigate HIV risk and TP. They predicted and found that those high in present orientation (both hedonists and fatalists) were more sexually active and had more sexual partners than those high in future orientation, but the latter were more likely to use alternate methods of reducing HIV exposure.

Because rates of HIV risk behavior and HIV infection are high among female prisoners, an interdisciplinary team of health researchers investigated the relationships between ZTPI scores and HIV risk behaviors among 177 incarcerated women in the Maryland Correctional Institution for Women (Hutton et al. 1999). The study sample was comparable to the general population ($N=978$) at that institution in regard to most demographic characteristics. As a group, these female prisoners scored a standard deviation higher on present TP than did female students. These findings indicate that "a future time perspective may reduce the likelihood of practicing HIV risk behavior" (Hutton et al. 1999, p. 14). Female prisoners who scored high on the Future subscale were less likely to have had an intravenous-drug-using sex partner, to have had large numbers of sex partners, or to have been "high" on drugs or alcohol during sex than peers who scored low on this scale. They were also less likely to have had a lifetime psychiatric dependency on cocaine or heroin. All of these associations were unconfounded by age, HIV infection, education, or race factors. Prisoners who scored high on the Present-Fatalistic scale were significantly more likely to engage in high-risk HIV behaviors by having sex when high on drugs or alcohol and to share needles or syringes (but these results were not significant when adjusted for sociodemographic variables). Finally, higher Present-Hedonistic scores were associated with prostitution (but also not when adjusted for sociodemographic variables).

Holman and Zimbardo (1999) investigated relationships among TP, coping with trauma, and social support issues in several college student samples. There was a negative association between how much students spoke with family members about

their stressful experiences and Past-Negative ($r(124)=-.26$, $p<.01$) and Present-Fatalistic ($r(124)=-.18$, $p<.05$) TP, but a positive association between how much students spoke with friends about their stress and degree of Present-Hedonism, $r(124)=.21$, $p<.05$. After students experienced stress, Past-Positive TP was positively associated with the degree of social support they received, $r(164)=.27$, $p<.001$, whereas Past-Negative TP was associated with the degree of social conflict they reported in the aftermath of stress, $r(159)=.16$, $p<.05$. In regard to coping activities used to deal with stress, Future TP was strongly associated with active problem-solving coping, $r(125)=.41$, $p<.001$, and emotional growth coping, $r(125)=.27$, $p<.01$. Present-Fatalistic TP was negatively associated with active problem-solving coping, $r(125)=-.21$, $p<.05$. Past-Positive TP was associated with positive emotional growth coping, $r(125)=.29$, $p<.001$, and Past-Negative TP was negatively associated with emotional growth coping, $r(125)=-.24$, $p<.01$. Present-hedonistic TP was associated with avoidance coping, $r(125)=.22$, $p<.05$.

The predictive value of the ZTPI was evident in correlations with measures taken 3 months later. In the aftermath of stress reported in the pretest–posttest assessment interval, the degree of social conflict reported was positive for Past-Negative TP, $r(63)=.28$, $p<.05$, but negative for Past-Positive TP, $r(63)=-.28$, $p<.05$, as well as Future TP, $r(63)=-.25$, $p<.05$. This data set supports the notion that the ZTPI may play a useful role in focusing attention on various stress reactions and coping strategies of specific groups of clients varying in their TPs.

Sleep and Dreaming Problems

In a study from the sleep laboratory of Robert Hicks, dreaming was related to ZTPI scores (Marquez et al. 1999). Posttraumatic dream reports correlated with scores on the Past-Negative scale, $r(294)=.19$, $p<.05$; the Present-Fatalistic scale, $r(294)=.13$, $p<.05$; and the Present-Hedonistic scale, $r(294)=.12$, $p<.05$. However, they did not correlate with Future or Past-Positive scale scores. Given that the frequent use of drugs, alcohol, or tobacco has detrimental effects on sleep and TP has been related to these behaviors (Keough et al. 1999), Hicks's research team reasoned that TP should relate to sleep problems. They found highly significant correlations ($p<.001$) between each of the three sleep problem scales and each of the five subscales of the ZTPI. These results suggest that "the ZTPI has implications for health-related behaviors in addition to the frequent use of certain substances" (Vranesh et al. 1999, p. 24).

Influence of Roles and Status

A demonstration of the influence that situational factors can have on TP comes from a recent study examining changes in dominant ZTPI factors across 4 years of cadet experience at the US Air Force Academy, as students progress from freshmen to

seniors and then on to officer status (Samuels 1997). The ZTPI was administered to 136 cadets and officers, about an equal number from each of the four classes, as well as officers at the academy. Officers were much lower than cadets of any level on Present-Fatalistic, Past-Negative, and Present-Hedonistic TP. On the Future factor, officers were highest (3.8), seniors were lower (3.5), and freshmen were lowest (3.3). Past-Positive scores showed a systematic increase over each of the 4 years of military training, from 3.7 in the freshman year up to 4.0 in the senior year. These data are in line with expectations based on the type of students recruited, the goals of military training, and officer job demands and reward contingencies (S. Samuels, personal communication, December 23, 1998). This cross-sectional study is being replicated with a longitudinal design to examine changes within individuals over time.

Research Participation Timing

Scores on the ZTPI predict the timing during a school term when college students sign up for participation in required research (Harber et al. 1999). The goal-directed, efficient work style of future-oriented students should encourage them to dispatch this requirement as early as possible, whereas their present-oriented peers should delay initiating this new demand on their time, procrastinate, become distracted, and thus begin their research commitment later and require more time to complete it. They should also be more tardy in meeting research obligations and more likely to be "no-shows" for experiments they signed up for than future-oriented students. Each of these predictions was confirmed.

Dates of research participation were monitored for 167 students in the initial study and for 287 students in a replication. As predicted, future-oriented students began participating sooner than present-oriented peers by 7.2 days ($p < .05$), a substantial disparity in a quarter system of only 9 weeks. By midterm, that discrepancy was maintained with a 7.1-day gap ($p < .05$), and completion of the quota took 8.5 days longer for present-oriented students ($p < .05$). This pattern was replicated the next year, with future-oriented students starting their participation earlier than present-oriented students ($p < .06$) and increasing it to a school week sooner both by midterm ($p < .01$) and by completion ($p < .05$). The Big Five Questionnaire trait of conscientiousness was evaluated as the possible mediating variable in this relationship, because it correlated positively with Future TP ($r = .38$) and negatively with present TP ($r = -.27$). Conscientiousness had no effect on any of the three research times, and when it was covaried out of the data, results remained significant for future-oriented students completing the requirement sooner than present-oriented students.

In addition, present-oriented students were three times as likely as future-oriented students to be "no-shows" even after they had signed up for given studies ($p < .05$). We also found that they were significantly more likely to be tardy than future-oriented students in submitting self-report data in a study colleagues were doing

that involved emotion diary reports being submitted regularly over a 4-week period. Despite the researchers' repeated emphasis that late data could not be used, present-oriented participants more frequently missed self-report submission deadlines than did their future-oriented peers, $t(31) = 3.12$, $p < .01$, being tardy an average of 3.4 times to only once for future-oriented participants. Thus, this differential failure to meet contractual obligations could bias the results of the study if TP were related to the phenomenon under investigation. Similarly, the data on TP variations in research participation sign-ups could be a source of unrecognized error variance in many studies. Research conducted primarily early in a term will involve an overrepresentation of future-oriented participants, whereas present-oriented participants should predominate in research conducted near the end of a term, thereby yielding failures to replicate or other distortions in research conclusions depending on the relationship of TP to the processes being studied.

Coping With Homelessness

Finally, we present a field study that extends the range of applicability of the TP construct beyond college student samples to reveal its functioning among homeless people living in city shelters (Epel et al. 1999). On arrival at a temporary family shelter, homeless adults ($N = 82$) completed our TP scale along with self-efficacy measures. When they were leaving 1–3 months later, they completed a report on their interim activities and their job and housing situations. Those higher on Future TP had shorter durations of homelessness, were more likely to enroll in school, and were more likely to report learning from and gaining positive benefits from their predicament. In contrast, those higher on present TP used more avoidant coping strategies, spending more time watching TV and eating, working less, and not saving money. Efficacy predicted time spent searching for housing and employment, but neither TP nor efficacy predicted obtaining stable housing, a social–economic–political issue beyond the realm of individual-differences effects. However, it is evident that the personal construction of psychological time has a significant impact on whether homeless people use their time in shelters constructively or "waste time" in indulgent, unproductive activities that reduce their likelihood of obtaining jobs or housing.

Conclusion and General Discussion

The overall pattern of data emerging from the array of research presented here provides strong evidence for the value of the ZTPI as an index of the fundamental and vital psychological construct of TP. The robust pattern of diverse, yet significant, relationships with a host of traditional personality measures and behavioral indexes reveals that the ZTPI is a reliable and valid measure of TP. Our scale also has demonstrated predictive utility in experimental, correlational, and case study research.

It promises to offer conceptual integration of many seemingly unrelated psychological concepts as long as they have a temporal underpinning. The reasonableness of that strong claim comes from acknowledging that humans exist in time, that every human life is time bound, and that time is ubiquitous in every known culture. Many basic psychological processes rely on some aspect of time, such as habituation, conditioning, memory, reinforcement contingencies, self-efficacy, anticipation, violations of expectation, evolutionary adaptiveness, guilt, depression, and anxiety, to name but a few. Even fundamental distinctions between cognitions and emotions are reconcilable within the framework provided by a temporally based theory in which emotions are cast as being evolutionarily more primal for immediate responding, whereas cognitions are cast as later adaptations for planning and reflective responding (Boyd 1999).

Our decades-long research and personal involvement with aspects of temporal perspective have convinced us that there are few other psychological variables capable of exerting such a powerful and pervasive impact on the behavior of individuals and the activities of societies. It is our hope that, as more researchers adopt the ZTPI as a measure of TP that is easy to administer and score, the empirical base of TP will be cumulatively solidified and its theoretical net stretched far and wide.

Limits and Extensions of the ZTPI

Although the development of the ZTPI emerged from the earlier scale designed by Gonzalez and Zimbardo (1985) and administered to a large, diverse population, its psychometric properties in the current research program were established with a variety of college student samples. Perhaps the greater range of ages, backgrounds, and career diversity of that normative sample contributed to the resulting four subfactors of the Future factor (Future-Work Motivation–Perseverance, Future-Goal Seeking–Long-Term Planning, Future-Specific Daily Planning, and Future-Pragmatic Action for Later Gain). By contrast, the ZTPI has but one Future TP. Perhaps further factor analyses of our scale with a variety of noncollege populations will again show a more complex set of future subfactors.

A further limitation of the generalizability of our scale may lie in its cultural relevance to individualist societies and their ambitions, tasks, and demands rather than to more collectivist, interdependent societies in which time is differently valued and conceptualized (Levine 1997). Obvious cross-cultural adaptations of the ZTPI are called for.

ZTPI and Personality Processes

Evident from much of the research reported here is the considerable overlap between the ZTPI and traditional personality measures, notably the five-factor model of personality. Some of our TP factors may be manifestations of inherent temperament

characteristics; if so, exploring how temporal dimensions relate to temperament may add new understandings of some of the Big Five dimensions. But recall that we have shown that, despite this overlap, there remains a uniquely independent contribution of our time factors, many of which relate to a greater range of behaviors than do the personality measures with which they correlate highly. In addition, future research may profit from the use of combined "profile patterns" of the five ZTPI factors instead of independent examination of ZTPI subscales. In this sense, we are allied to personality psychologists, who "explore the mechanisms that mediate person-environment transactions and the ways in which these psychological mechanisms give rise to the uniqueness of each person" (Caprara 1999, p. 127). As social psychologists, we also acknowledge the power of situations to modify even stable individual differences. As demonstrated, TP can be influenced by situational forces such as status change, trauma, or altered states of consciousness, as seen in the Stanford Prison Experiment (Zimbardo et al. 1973), or by hypnotic alteration of time orientation (Zimbardo et al. 1971).

Transcendental Future TP

For many people, the focus on the future does not terminate with the death of the body, because they believe in some form of existence after death. We recently developed a separate scale to assess individual differences in this postdeath dimension of TP among a large sample of 1,235 respondents (Boyd and Zimbardo 1996). Respondents who score high on the Transcendental Future scale believe that they will be rewarded or punished for their present behavior, just as those high on the traditional Future scale do, but for the former reinforcement comes only after their death. This time factor was higher for women than men and higher for those more than 50 years old than those in their 20s. It was highest for those high in religiosity and religious practices, for African Americans and Hispanics, and for Protestants and Catholics and lowest for Buddhists and Jews. It was related to both past ZTPI factors and to the Present-Fatalistic factor but not to the traditional Future and Present-Hedonistic factors. Moreover, when factor analyzed with the 132 items of the Big Five Questionnaire, Transcendental Future remained a distinct factor, suggesting that it is an individual-differences dimension unaccounted for by traditional personality analyses.

Power of Past TP

We were surprised to find that the Past-Negative scale occupied such a prominent place in the factor structure of the ZTPI. Recently, the important role of past temporal orientation and the psychological distress of trauma victims was documented in

a longitudinal, cross-sectional study conducted by Holman and Silver (1998). These researchers found that a past orientation focusing cognitively and emotionally on a prior trauma is associated with prolonged elevated levels of distress. In addition, those most traumatized by their experience often exhibit "temporal disintegration," in which the present is isolated from the past and future. This time zone discontinuity was found to contribute to greater suffering among these already-distressed victims.

Quite the opposite was found among college students in a study that examined how a Past-Positive TP might build functional bridges to the future (Goldberg and Maslach 1996). Nearly 300 participants completed the ZTPI, the Big Five Questionnaire, and a detailed report of their past and present familial experiences. Past-positive TP was positively correlated with practicing traditions, planning to practice family traditions, including more generations in describing important family events, seeing family members for everyday events or for no particular reason, and writing about routine family events. In contrast, Past-Negative TP was negatively correlated with practicing traditions and writing about routine family events but positively correlated with writing about rare family events. The authors made a strong case for the importance of the positive past temporal orientation as contributing to developing a sense of personal continuity over time and thus feeding into a richer Future perspective (see also Kamiol and Ross 1996).

The Present-Oriented Child in a Future-Oriented Educational Environment

We have reported at length about the syndrome of behaviors and traits that are associated with a present TP and how they combine to predispose such individuals to greater likelihood of failure when faced with situations demanding delay of gratification, planning, goal setting, and resisting temptations and distractions when there is work to be done. We have come to believe that high dropout rates among students of low socioeconomic status at all levels of schooling are more a consequence of "TP discordance" than deficits in intelligence or intellectual abilities. Those high on present TP may be "speaking a present-oriented dialect" in a setting that recognizes only the meaning and value of future-oriented language. Children from families and communities where present fatalism and hedonism predominate will not be as prepared as their peers to think in terms of causalities, probabilities, and if–then sequences or to tolerate boring lessons even if they may reap a payoff later. We advocate novel interventions that would teach these children the "language" of Future TP and how to use whatever TP is most appropriate to the school, work, home, or community setting in which they find themselves.

A second practical consequence of altering Present-Hedonistic and Present-Fatalistic TP is the increased likelihood that those with these TP biases will be seduced into substance abuse, dangerous sexual activities, and failure to use

relevant health maintenance or illness-prevention strategies. Educational messages that encourage primary prevention strategies are most instrumental in changing behavior in desired directions (Sundberg 1985), but they will be effective primarily for those who are already future oriented and rarely for those who are present oriented and need to practice them most (see Alvos et al. 1993). Individuals without a well-developed Future TP may not have the cognitive scaffolding on which to hang mental scenarios of the negative future consequences of their present behavior. New persuasive appeals are called for that are tailored in style and content to the present orientation of adolescents and adults.

Our investigation into the dynamics of TP has made us aware of a completely neglected area of psychological research, that of the psychology of temptation. The classical biblical situation of acting now to get immediate pleasures of the flesh while failing to recognize the "wages of sin" that will lead to damnation has not been studied by psychological researchers. It is quite different from the research protocol of delay of gratification studies (Mischel et al. 1988), in which a person chooses between a small immediate reward and a bigger delayed one, because in temptation the choice is certain pleasure now and probable pain later. This important psychological phenomenon (that should trap present-oriented individuals most often) deserves to be explored experimentally, with the blessings of human subjects research committees.

At the other end of the spectrum, we are concerned for those excessively future-oriented people who cannot "waste" time relating to family or friends, in community activities, or enjoying any personal indulgence. Such a "time press" fuels high stress levels, especially in today's global economy in which excessive workloads seep over into personal time through the availability of technology to work anywhere, anytime (Levine 1997). Driven by the curse of having their ambitious goals realized by endless work agendas, these people—successful in careers but unsuccessful in life—may need "time therapy" to develop a broader temporal perspective in which to integrate work, play, and social responsibility.

A Balanced TP

This conjecture leads us to promote the ideal of a "balanced TP" as most psychologically and physically healthy for individuals and optimal for societal functioning. Balance is defined as the mental ability to switch flexibly among TPs depending on task features, situational considerations, and personal resources rather than be biased toward a specific TP that is not adaptive across situations. The future focus gives people wings to soar to new heights of achievement, the past (positive) focus establishes their roots with tradition and grounds their sense of personal identity, and the present (hedonistic) focus nourishes their daily lives with the playfulness of youth and the joys of sensuality. People need all of them harmoniously operating to realize fully their human potential.

Annexes A

Zimbardo Time Perspective Inventory Items

1. I believe that getting together with one's friends to party is one of life's important pleasures.
2. Familiar childhood sights, sounds, and smells often bring back a flood of wonderful memories.
3. Fate determines much in my life.
4. I often think of what I should have done differently in my life.
5. My decisions are mostly influenced by people and things around me.
6. I believe that a person's day should be planned ahead each morning.
7. It gives me pleasure to think about my past.
8. I do things impulsively.
9. If things don't get done on time, I don't worry about it.
10. When I want to achieve something, I set goals and consider specific means for reaching those goals.
11. On balance, there is much more good to recall than bad in my past.
12. When listening to my favorite music, I often lose all track of time.
13. Meeting tomorrow's deadlines and doing other necessary work comes before tonight's play.
14. Since whatever will be will be, it doesn't really matter what I do.
15. I enjoy stories about how things used to be in the "good old times."
16. Painful past experiences keep being replayed in my mind.
17. I try to live my life as fully as possible, one day at a time.
18. It upsets me to be late for appointments.
19. Ideally, I would live each day as if it were my last.
20. Happy memories of good times spring readily to mind.
21. I meet my obligations to friends and authorities on time.
22. I've taken my share of abuse and rejection in the past.
23. I make decisions on the spur of the moment.
24. I take each day as it is rather than try to plan it out.
25. The past has too many unpleasant memories that I prefer not to think about.
26. It is important to put excitement in my life.
27. I've made mistakes in the past that I wish I could undo.
28. I feel that it's more important to enjoy what you're doing than to get work done on time.
29. I get nostalgic about my childhood.
30. Before making a decision, I weigh the costs against the benefits.
31. Taking risks keeps my life from becoming boring.
32. It is more important for me to enjoy life's journey than to focus only on the destination.
33. Things rarely work out as I expected.
34. It's hard for me to forget unpleasant images of my youth.

35. It takes joy out of the process and flow of my activities, if I have to think about goals, outcomes, and products.
36. Even when I am enjoying the present, I am drawn back to comparisons with similar past experiences.
37. You can't really plan for the future because things change so much.
38. My life path is controlled by forces I cannot influence.
39. It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway.
40. I complete projects on time by making steady progress.
41. I find myself tuning out when family members talk about the way things used to be.
42. I take risks to put excitement in my life.
43. I make lists of things to do.
44. I often follow my heart more than my head.
45. I am able to resist temptations when I know that there is work to be done.
46. I find myself getting swept up in the excitement of the moment.
47. Life today is too complicated; I would prefer the simpler life of the past.
48. I prefer friends who are spontaneous rather than predictable.
49. I like family rituals and traditions that are regularly repeated.
50. I think about the bad things that have happened to me in the past.
51. I keep working at difficult, uninteresting tasks if they will help me get ahead.
52. Spending what I earn on pleasures today is better than saving for tomorrow's security.
53. Often luck pays off better than hard work.
54. I think about the good things that I have missed out on in my life.
55. I like my close relationships to be passionate.
56. There will always be time to catch up on my work.

Note: Respondents are asked to read each item and, as honestly as they can, answer the following question: "How characteristic or true is this of you?" (1 = very uncharacteristic, 2 = uncharacteristic, 3 = neutral, 4 = characteristic, 5 = very characteristic).

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