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<td>Abstract</td>
<td>Research on time perspective (TP) has struggled with several conceptual and methodological problems. One of the consistently identified shortcomings is the scarcity of reliable psychological assessment instruments. In this chapter, the authors provide a critical analysis concerning the methodological evolution of the assessment of the subjective temporality, and briefly describe some of the most representative measures. While most assessment efforts were initially set on the use of qualitative procedures, current research studies and conceptual developments are mainly founded on the use of quantitative assessment instruments providing several measurement indicators. There are, however, some remaining issues that must be addressed concerning the construction and development of innovative assessment procedures used in the understanding of the impact of subjective temporality constructs on individual and social behavior.</td>
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Assessment Techniques in the Study of Time Perspective and Subjective Time: From Qualitative to Quantitative Assessment

Victor E.C. Ortuño, Maria Paula Paixão, and Isabel Nunes Janeiro

What gets us into trouble is not what we don’t know
It’s what we know for sure that just ain’t so.
—Mark Twain

Since the first moment when humans began asking existential questions, two powerful ideas have dominated: the meaning of life and the existence of God. Still, there is a third idea that has mesmerized humans for as long as history can remember. And that idea is time, a notion that connects

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with those two first ideas, but also is a structure that brings order to human existence (Kant, 1781/1997). According to Dias, “Time is one of the classic concepts whose study still holds a timeless relevance” (2009, p. 42). In part, this is because time, or more specifically the unique human ability to think about the future, has been considered a catalyst for our species's success (Husman & Shell, 2008); it is certainly one of our biggest evolutionary advantages over other species.

Aside from absolute conceptions about time from ancient Greek philosophers like Zeno or Aristotle, the mechanistic view of Isaac Newton, or the relativistic interpretation of Einstein about temporal phenomena, psychologists and other social practitioners and scientists have another relevant aspect of time to be considered—the individual one. Time genesis as a psychological phenomenon can be understood from a constructivist point of view, as proposed by Piaget (1986). Within this model, the knowledge (in this specific case, temporal) does not come solely from the external objects of the individual (empiricism) nor from endogenous structures already present in him (innateness). Instead, it originates from the interaction of these two components (Piaget, 1986). Through Piaget (1977) experiments, we learned that time is critical in the intellectual development of children, but the opposite is also true: children’s intellectual development is crucial for them to understand temporal phenomena. The development of time perspective (TP) is directly influenced by external factors such as socialization, education, and culture (Seginer, 2009).

In this chapter, we focus on assessment of temporal concepts related to the subjective and individual aspects of time, categorized as Time III by Vásquez (2011). In this categorization, psychological time is divided into four categories: Time I, or cosmological time, is related to natural cycles and their effects on the biological aspects of behavior; Time II, or perceptive time, focuses on the study of temporal perception and estimation; Time III, or subjective time, which is connected with individuals’ personal conceptions of time and the cognitive processes grounded in time; and Time IV, or cultural time, relates to the temporal concepts that are developed socially, such as cultural representations of time and the values associated with it.

The definition of subjective time has always been troublesome, with several approaches but no real consensus on its definition, dimensions,
and measurement. If we take into account a broad approach to subjective temporality, we can find a large number of paradigms; some have received more attention than others from the scientific community in the last decades. Some of the concepts proposed are the following: time orientation (Nuttin & Lens, 1985), time perspective (Zimbardo & Boyd, 1999), temporal focus (Shipp, Edwards, & Lambert, 2009), consideration of the future consequences (CFC, Joireman, Shaffer, Balliet, & Strathman, 2012), and future hope (Snyder et al., 1991). According to Vella (1977, cit. in Lennings, 1994), over 100 methods have been developed to measure temporal orientation. McGrath and Kelly (1986) and Boniwell and Zimbardo (2004) also identify the existence of about 211 approaches to time perspective (TP), which taken with the existent lack of efforts to compare results across different assessment instruments in subjective temporality topics (Ortuño & Janeiro, 2009, 2010) makes it “impossible to measure a construct that has as many conceptualizations as there are measurement tools” (Lasane & O’Donnell, 2005, p. 15).

It is relevant to make a clear distinction between two of these time concepts, since several misunderstandings have been created around them: time perspective and time orientation. Time perspective, or TP, is a multidimensional concept related to the use of temporal categories of past, present, and future dimensions. These categories are used to create a coherent organization of the individual’s internal and external motivational objects. Time orientation, on the other hand, according to Lasane and O’Donnell (2005) refers to a more circumscribed concept involving individual’s preference for a determined temporal dimension (Nuttin & Lens, 1985).

In our understanding, one of the most important concepts regarding the individual’s temporality is the concept of TP. First referred to by Frank (1939, as cited by Lewin, 1943), it is a concept related to the individual’s life-space and is not limited by the present time. On the contrary, it includes also the individual’s remembered past and imagined future. The importance of this concept for psychology is underscored by Lewin (1942) when he states that “the behavior of an individual does not depend entirely on his present situation. His mood is deeply affected by his hopes and wishes and by his views of his own past” (pp. 104). These early approaches to TP conceive it as transitory motivational states that affect
the individual’s level of aspiration, mood, constructiveness, and initiative at a given time (Lewin, 1943). Lens (1986) suggests that the operationalization of future time perspective (and consequently TPs) over time has evolved from being considered as a motivational state to its conceptualization as a more stable personality trait.

The theoretical framework for TP proposed by Lewin encouraged a plethora of studies regarding subjective time (Nuttin & Lens, 1985). Also, it served as the foundation for subsequent theoretical models about subjective time, such as Nuttin and Lens’s (1985) model of TP. These authors conceive TP as a cognitive-spatial concept—cognitive because it is formed by motivational objects or events that exist on the cognitive level of behavioral functioning, and spatial because these same motivational objects of events are located on a temporal continuum. Individuals perceive these motivational objects as located either in the past, present, or future, even when in fact, physically, those same objects or events are thought of by the individual in the present moment.

TP multidimensionality is based on the independence of the three temporal frames, namely past, present, and future TPs. Still, authors like Nuttin and Lens (1985) suggest specific subdimensions within the future time perspective, such as extension, density, degree of structuration, and level of realism. These subdimensions vary according to each author’s conceptualization of TP and are explored in detail later, as we discuss different models.

According to Ortuño (2014), in order to avoid misunderstandings it is important to differentiate between TP temporal dimensions (past, present, and future) and their characteristics or properties. If we take, for example, an individual’s temporal extension, it represents an attribute of this same individual past or future time perspective. The same goes for the other properties previously mentioned. Such an approach of the temporal concepts allows organization of the different existing assessment techniques using varied criteria:

1. **Theoretical basis**: There are instruments like the Thematic Apperception Test (TAT; Wohlford, 1966) or the Circle Test (Cottle, 1976) that are psychoanalytic oriented (since the defense mechanism of projection is on the basis of the evaluation system they adopt); on
the other hand, there are instruments like the Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999) or the Consideration of the Future Consequences Scale (CFCS; Joireman et al., 2012) that follow a more cognitive approach of subjective time assessment.

2. **Measured construct**: An individual’s subjective temporality is composed of several variables (such as TP, CFC, and hope, among many others) and their respective sublevels, dimensions, or properties (like temporal attitude, temporal orientation for TP or the future, and immediate for consideration of the future consequences).

3. **Temporal scope (partial or complete)**: There are instruments that measure only one temporal dimension, such as the Future Anxiety Scale (Zaleski, 1996), while there are others that try to measure the entire individual’s temporal horizon, like the ZTPI (Zimbardo & Boyd, 1999).

4. **Relation with time**: Some constructs represent concepts directly related with time, such as TP, time attitude, or time orientation while others represent concepts indirectly related with time; some examples are future hope (Snyder et al., 1996) and sensation seeking (Zuckerman, Eysenck, & Eysenck, 1978).

Historically, the first inventories created to measure subjective temporal concepts were story- or graphic-based techniques following psychoanalytic principles. A couple of examples would be the Future Events Test (Kastenbaum, 1961) or the Time Metaphors (Knapp & Garbutt, 1958), although Boniwell, Osin, Linley, and Ivanchenko (2010) say that these approaches had flaws regarding their validity and reliability.

One of the most influential qualitative instruments developed to assess concepts related to subjective temporality is the Motivational Induction Method (MIM; Nuttin & Lens, 1985). In its shortest version, the MIM includes two small booklets with 20 and 10 pages, respectively. On top of each page there is a motivational inducer. These sentence beginnings are formulated in the first-person and the verb always expresses a tendency, effort, desire, intention, and the like. The sentence beginnings in the first booklet are formulated to induce positive motivational objects (e.g., I intensely desire…) while those in the...
second ask for negative objects, or objects that are avoided, feared, and so on (e.g., I would not like it if …). Participants are invited to write a full sentence by expressing what they desire or fear. Each goal object expressed in the sentence completions is coded according to both a content code, which comprises eight main categories of content analysis (self, self-realization, realization, contact, cognitive exploration, possession, leisure, and transcendental) and some dozens of subcategories, and a temporal code comprising calendar units (near future) and social and biological units (intermediate and distant future, as well as the historical future and the open present). Using the MIM, we can calculate several TP indicators, such as future temporal extension and temporal density (Paixão, Abreu, & Lens, 2012).

MIM has been successfully used in a vast number of studies. Bouffard, Lapierre, and Bastin (1989) found an association between future time perspective, socioeconomic status, and level of schooling. It has also been used to assess differences in TP in adolescence, young adulthood, and adulthood in different groups, as well as future time perspective associations with several psychological and behavioral constructs (Paixão, 1996; Vázquez & Rapetti, 2005). Nevertheless, MIM has lost popularity in recent years to shorter instruments that are easier to score and interpret.

Other instruments developed within the qualitative paradigm are the Thematic Apperception Test (TAT; Wohlford, 1966), the Rappaport Time Line (Rappaport, Enrich, & Wilson, 1985), Cottle’s Circle Test (Cottle & Klineberg, 1974), and the Life Events Inventory (Nurmi, 1991). Currently, the use of qualitative instruments has diminished drastically, mostly due to a focus on developing instruments with stronger psychometric guarantees.

In the last decades, simpler and more objective approaches to assess TP were carried out (Zimbardo & Boyd, 1999), some examples are the Future Anxiety Scale (Zaleski, 1996; Zaleski, Sobol-Kwapinska, Przepiorka, & Meisner, 2017), the Future Time Orientation Scale (Gjesme, 1979), the Long-Term Personal Direction Scale (LTPD, Wessman, 1973), and the Future Time Perspective Questionnaire (Stouthard & Peetsma, 1999). After an analysis of these inventories, it is possible to agree with Boniwell et al. (2010), who state that these
instruments clearly represent an improvement regarding the statistical indicators but it is at the expense of presenting lower assessment capabilities, since they are mostly focused on one predominant time orientation.

Nevertheless, a cursory glance at the subjective time research shows an uneven distribution in the number of publications about each of the three temporal frames (past, present, and future). Most of the studies are focused on the future frame. Shores and Scott (2007) argue that “the bulk of TP research has investigated the relationship of future and present time perspectives to other psychological constructs and behavioural outcomes. Less empirical attention has been given to past orientations” (p. 31). We believe that one cause for the dominance of future over the other two temporal frames is the influence of well-known authors like Nuttin and Lens (1985), Gjesme (1979, 1983), and Nurmi (1991), who have devoted much of their research efforts to studying the influence of future TP on individuals’ motivation. Nuttin and Lens (1985), for example, have discussed future time perspective as being the individual’s main motivational space.

The influence of future time perspective is especially important when exploring cognitions and/or behaviors profoundly related to planning, anticipation, and achievement. But, as demonstrated by Ortuño and Vásquez (2013), some of the negative temporal frames such as Past-negative and Future-negative are important predictors of self-esteem. Also, emotional states are related to both the Past-negative and Present-hedonist perspectives (Stolarski, Matthews, Postek, Zimbardo, & Bitner, 2014). Ortuño et al. (2013) report that the Past-negative is a significant negative and moderate predictor of satisfaction with life, interpersonal relations, and psychological well-being. We consider that currently there is enough evidence about the important role not only of future time perspective but also of past and present time perspectives in the understanding of cognition and behavior. As such, depending on the nature of the construct that is intended to be studied, researchers should consider different TPs and not only its future frame.

One of the latest TP models that follows Lewin’s and also Nuttin and Lens’s (1985) theory is proposed by Zimbardo and Boyd (1999). This new approach is characterized by a multidimensional approach to TP. While Nuttin and Lens (1985) acknowledge the existence of the past
and future temporal frames, they decided to focus on the motivational impact of the future time perspective on present behavior, while Zimbardo and Boyd (1999) take an integrative view of all temporal frames, including past, present, and future, as a cognitive-motivational process with large implications not only for motivation but also for objects perceptions.

According to Zimbardo and Boyd (1999), 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” (pp. 1271). The authors also refer to TP’s involvement in all process of encoding, storing, and retrieving of past events, as well as the development of expectations and goals; as such, it has a strong impact at both cognitive and behavioral levels.

The Zimbardo Time Perspective Inventory (ZTPI, Zimbardo & Boyd, 1999) has been one of the most widespread instruments in the last two decades, with more than 1600 citations on the Google Scholar database (Ortuño, Janeiro, Paixão, Esteves, & Cordeiro, in press). The instrument and the theoretical basis presented by Zimbardo and Boyd (1999) redefined research in subjective temporality by demonstrating the independence of the three main temporal frames (the past, the present, and the future) and the importance of studying the complete temporal horizon and not just one of its frames (usually the future). These authors present an inventory that is easy to administer, score, and interpret; it is allied with a coherent structure of five temporal dimensions: Past-positive, Past-negative, Present-hedonist, Present-fatalist, and Future. The ZTPI has been adapted by more than 24 countries and used a series of cross-cultural studies, demonstrating with a sample of about 12,000 participants that the five-factor structure is present in most countries where data were collected (Sircova et al., 2014).

Over time, some adjustments were introduced to Zimbardo and Boyd’s (1999) model. The Transcendental-Future Time Perspective Scale (TFTPS, Zimbardo & Boyd, 2008) was the first addition, which comprises 10 statements about the possible life after the death of the physical body. Still, the research body gathered since its conception isn’t clear about the relevance of this construct. Few researchers have studied this
temporal dimension (Desmmyter & De Raedt, 2012; van Beek & Kairys, 2015), and the results haven’t been consistent across studies. A few examples of studies addressing this temporal dimension are presented by Ortuño, Paixão, and Janeiro (2011), who in a cross-sectional study with a sample of college students found a decrease in the average values of TFTP as students advance in school.

Given the nature of its content, the transcendental future time perspective can be partially associated with religious beliefs, since many religions are based on the belief of life after death, of an immortal soul or entity that will be rewarded or punished according to the individual’s actions on earth. However, we believe that transcendental future should not be exclusive of religious individuals; it may also exist in individuals who manifest a high degree of spirituality, even if they don’t relate to any religious doctrine. Seema, Baltin, and Sircova (2014) argue that TFTPS measures afterlife beliefs but not necessarily a TP related to this temporal frame.

A second addition to Zimbardo and Boyd’s model follows Lewin’s (1939) considerations about the influence of the negative future temporality on individuals. It refers to the future negative, a dimension that only a small body of researchers has addressed (Holman & Silver, 2005) and without reaching a consensus about its measurement. Carelli, Wiberg, and Wiberg (2011) introduced eight items to ZTPI related with a negative view about the future which, according to the presented results, is associated with both dependent and avoidant decisional styles. Janeiro (2012) developed the Time Perspective Scale (TPS), which is formed by four temporal dimensions: Past orientation, Present orientation, Future orientation, and a four-item dimension called Anxious Vision about the Future, which presented good psychometric indicators. This last dimension was included in Zimbardo’s model revision by Ortuño et al. (in press), giving a coherent contribution to the model both at the theoretical and at the psychometrical level. Ortuño and Vásquez (2013) demonstrated its predictive power regarding trait self-esteem.

A last approach to Zimbardo’s theory is related to the balanced time perspective that represents an individual’s ability to flexibly switch between the TPs when considering situational demands. Zhang, Howell, and Stolarski (2013) proposed the Deviation of the Balanced Time
Perspective (DBTP) coefficient, a method to aggregate ZTPI’s scores; it includes the optimal scores of the five temporal dimensions and the individual’s score in each of these same dimensions. The result allows identifying the individual’s proximity or deviance from the optimal TP. Other authors, using different BTP methods, have also found relations between BTP and adaptive constructs, such as subjective happiness and mindfulness (Drake, Duncan, Sutherland, Abernethy, & Henry, 2008), life satisfaction, optimism, purpose in life, and self-efficacy (Boniwell et al., 2010). The three methods proposed by each of these authors present valid solutions to calculate the balanced time perspective and they do not require the use of any additional instrument.

In a different approach, Webster (2011) designed the Balanced Time Perspective Scale (BTPS) in order to assess an individual’s present balance between past and future time perspectives. The interaction between past and future dimensions allows consideration of four temporal categories: Time Expansive, Futurist, Reminiscers, and Time Restrictive. Time Expansive individuals are those with higher values in happiness, subjective well-being, and self-esteem. Yet, as acknowledged by the BTPS author, it doesn’t contain a present subscale. This inventory was proposed not as a substitute to ZTPI but, according to its author, to address a flaw related to the measurement of the balanced time perspective. However, although it appears to be a psychometrically and conceptually valid instrument, BTPS lacks dimensions to measure the subjective present (Stahl, 2012); we consider that a complete conceptualization about a balanced time perspective should include dimensions related to the three archetypal temporal frames (past, present, and future).

In order to overcome this limitation Vowinckel, Westerhof, Bohlmeijer, and Webster (2015) developed the Present-Eudaimonic Time Perspective scale, which assesses a positive vision about the present, where personal growth, life’s meaning, and living a full and satisfying life are the main aspects to be considered. This new scale was included in the BTPS, with a good factor structure of four components. Through regression analysis, the authors show how the Present-Eudaimonic scale alone makes a significant contribution to the prediction of mindfulness, flow proneness, and positive mental health.
The Zimbardo and Boyd model has received several critiques during the years, mostly focused on two aspects: (1) the content validity of the five temporal dimensions, since it include aspects that are not only related with time orientation but also with other temporal considerations. For instance, Webster (2011) mentions that some items of the future subscale are more related with time management than TP; (2) the ZTPI factor structure is not as uniform and culturally invariant as mentioned by previous literature (McKay et al., 2015). Worrel, Mello and Buhl (2011) have also raised concerns about the ZTPI’s scarce associations with other temporal phenomena and also with its psychometric characteristics.

Mello and Worrell (2016) present a different model of TP, formed by the dimensions of time meaning, time frequency, time orientation, time relation, and time attitude. These authors propose a new instrument to operationalize these dimensions, called the Adolescent Time Inventory (ATI). Time meaning is referred by its authors as “individuals’ definitions of the past, present, and future” (p. 1). Time frequency refers to how often individuals’ think about the past, present, and future. Time orientation represents the overall tendency of an individual to function in a determined temporal frame. Time relation is the subjective notion of past, present, and future relatedness. And finally, time attitude is related to the affective component associated with each temporal frame. Still, some of these dimensions overlap with previously developed concepts. It is relevant to consider that the ATI has been adapted to several languages and cultures, such as: German (Worrell, Mello, & Buhl, 2013), Hindu, Japanese, Spanish, Swedish, and Chinese, among others. Within the most recent developments in subjective time assessment, ATI is the only instrument that combines quantitative and qualitative approaches.

Husman and Shell (2008) developed an inventory specifically measuring the future time perspective dimensions of value, connectedness, extension, and speed. Specifically, these dimensions referred to are: value is the importance that a goal has for the individual; connectedness represents individuals’ ability to link their activities with its own goals; extension is related to the distance between the present moment and how far away the goals are projected; and speed represents the subjective sense of the speed of time passing. In order to operationalize this model, Husman and Shell (2008) developed the Future Time Perspective Scale (FTPS),
composed of those same four components, and they demonstrate that it reached a strong and coherent factor structure with high reliability (except for the speed component): value (seven items, $\alpha = .76$), connectedness (15 items, $\alpha = .80$), extension (six items, $\alpha = .74$) and speed (five items, $\alpha = .66$), with a total of 27 items.

More recently, Janeiro (2012) presented the Time Perspective Scales (TPS) as a new proposal to measure TP and some of its dimensions. The psychometric results are positive and allow consideration of TPS as a valid and reliable instrument to measure not only TP in its three temporal frames but also the temporal extension and temporal affectivity, both positive and negative, regarding the future. TPS has already been adapted to Brazilian Portuguese (Janeiro, Bardagi, Teixeira, & Ortuño, 2016). We note two drawbacks regarding this instrument: it lacks the assessment of the negative valence regarding the past and the present time perspectives, and it is still not culturally adapted to languages other than Portuguese (both in Portugal and Brazil).

The capacity to foresee one’s personal future and mental time travel is a shared and probably unique human feature. It has been suggested that it is a great adaptive advantage for our species (Suddendorf & Corballis, 2007). But this capacity also posits an internal conflict between immediate and distant outcomes and rewards for our behavior. For example, some people sacrifice an immediate pleasure or benefit for a distant, subjectively better outcome (e.g., not eating dessert now to be slimmer in the summer). To address scientifically how people respond differently to these dilemmas, the concept of CFC was proposed. The study of individual differences in CFC was defined as “the extent to which people consider the potential distant outcomes of their current behaviours and the extent to which they are influenced by these potential outcomes” (Strathman, Gleich, Boninger, & Edwards, 1994, p. 743). It was shown that the CFCS is a reliable, stable, and valid construct, related to many other psychological and social phenomena. According to Aspinwall (2011), the CFC concept is mostly related to the subjective value of future versus present outcomes. In Zimbardo and Boyd’s (1999) study, this concept was positively correlated only with the future time perspective, it correlated negatively with the Past-negative, Present-fatalist, and Present-hedonist, and it showed no correlation with the Past-positive.
The CFCS measures the extent to which individuals reflect and are influenced by the immediate, as well as by the distant outcomes of current behavior (Strathman et al., 1994). It is composed of 12 items (five-point Likert scale), grouped into two subscales (future and immediate). The psychometric properties are good, with internal reliabilities typically ranging from .80 to .86, and test-retest correlations of .76 (two weeks) and .72 (five weeks), with all data relating to the complete, 12-item scale. Strathman et al. (1994) reported exploratory and confirmatory factor analyses supporting the idea of a single underlying factor. However, research carried out later suggests that the scale comprises two factors (Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008; Petrocelli, 2003; Vásquez, Esteves, Gomes, & Ortuño, 2015). For instance, Joireman et al. (2008) explored the validity of the two-factor solution. They found that the two subfactors differentially predict the trait of self-control—ego depletion and temporal discounting—with the immediate consideration of the future consequences subscale being the best and unique predictor. More recently, Joireman et al. (2012) have successfully tested a 14-item CFCS, with better factor structure and internal consistency.

Concerning the discriminant validity of the English version of the CFCS, Joireman, Strathman, and Balliet (2006) have shown the validity of the CFCS across four domains: (1) health behavior, risk-taking, and academic achievement; (2) aggression; (3) pro-social organizational behavior; and (4) pro-environmental attitudes and behavior. First, it was demonstrated that individuals who scored high on the CFCS scale reported greater general concern with health, exercising more frequently and with a lower substance abuse (Ouellette, Hessling, Gibbons, Reis-Bergan, & Gerrard, 2005). Also, they were less likely to engage in risky sexual practices and more likely to get an HIV test (Dorr, Krueckeberg, Strathman, & Wood, 1999). Second, it was consistently shown that CFCS relates to aggression. The CFC mediates the relationship between impulsivity and aggression, given that impulsive people have less consideration for the consequences of their actions, which makes them more likely to engage in violent behavior. Third, some aspects of organizational behavior are also predicted by the CFCS. Research has shown that CFCS is related to willingness to engage in prosocial organizational behaviour and knowledge sharing in organizations (Joireman, Daniels, George-
Lastly, individuals high in CFC are usually more concerned with environmental conditions and the use of natural resources, they have better attitudes to recycling (Lindsay & Strathman, 1997), they tend to defend and be concerned about the environment (Joireman, Lasane, Bennett, Richards, & Solaimani, 2001), and they have stronger preferences for public transportation and for structural solutions for transportation dilemmas (Joireman, 2005; Joireman, Van Lange, & Van Vugt, 2004).

Another concept directly related to individuals’ temporal experience is future hope. Snyder, Feldman, Shorey, and Rand (2002) suggest its assessment via the Adult Hope Scale (AHS), which is a two-dimension inventory composed of 14 items using a four-point Likert response format (1 = definitely false, 2 = mostly false, 3 = mostly true, 4 = definitely true). Eight items are related to dispositional hope (four are designed to measure agency thinking and four pathways thinking); the remaining four items are fillers. Snyder et al. (1991) reported acceptable values of internal reliability (Cronbach’s alpha in the total scale from .74 to .84; the agency subscale from .71 to .76; and the pathways subscale from .63 to .80). A similar pattern regarding AHS reliability was reported in previous studies (Pais-Ribeiro, Pedro, & Marques, 2006; Phan, 2013; Rand, 2009; Tong, Fredrickson, Chang, & Lim, 2010). Its temporal stability is also acceptable, since the AHS presented a test-retest correlation of .85 (p < .001) after a three-week interval (Snyder et al., 1991).

Results obtained using AHS showed important and positive correlations with positive traits such as dispositional optimism (r = .60, p < .005), desirability of control (r = .54, p < .005), self-esteem (r = .58, p < .005; Gibb, 1990), subjective well-being (r = .52, p < .01; Melo & Pais-Ribeiro, 2010), and global life satisfaction (Marques, Pais-Ribeiro, & Lopez, 2009). AHS scores are negatively correlated with negative traits as depression (r = −.60, p < .001), hysteria (r = −.35, p < .001), psychopathic deviation (r = −.43, p < .001), schizophrenia (r = −.46, p < .001), and social introversion (r = −.59, p < .001; Irving, Crenshaw, Snyder, Francis, & Gentry, 1990). Interventions centered on the hope concept have established its pertinence concerning adaptive cognitions, such as life satisfaction and self-worth (Marques, Pais-Ribeiro, & Lopez, 2011).
Concerning the relation of this concept with other temporal variables, Aspinwall (2011) states that hope is related to the content of future orientation, but there is no reference to the extent of this relation. Phan (2009), through a SEM approach and using a reduced version of ZTPI composed only of future and present dimensions, showed that hope is mainly influenced by present time perspective, while future time perspective exhibits a small influence, but without statistical significance. Still, more evidence is needed in order to fully understand the association between hope and a more complete characterization of the individual’s temporal profile, since Snyder et al. (1991) consider that hope is related not only with the future but also with the past and the present.

Some considerations about the two main components of Snyder’s hope concept may also be addressed. “Pathway” is defined as an individual’s ability to produce means to achieve certain goals (Snyder et al., 2002). We believe that pathway may be related to future time perspective, owing, for example, to the association reported by De Volder and Lens (1982) of the subjective value assigned to long-term goals and the instrumental value of the activities related to those same goals with school motivation and academic results. In the case of agency, Snyder et al. (2002) present it as an individual’s cognition regarding his or her ability to successfully achieve his or her goals—structurally different from the concepts of optimism and self-efficacy. Still, we consider that agency is more an affective component of hope, so temporal affectivity would certainly be related to it. Likewise, since self-esteem is considered as the evaluative part of self-concept (Heatherton & Wyland, 2003), and it is negatively correlated with the more TP’s negative dimensions (past negative and future negative), we believe that those dimensions of TP will be equally negatively associated with agency, which is a dimension that requires a certain sense of self-evaluation.

The Temporal Focus Scale (TFS, Shipp et al., 2009) is presented as an inventory to measure the concept of temporal focus, which its authors define as “the attention individuals devote to thinking about the past, present, and future” (p. 1). These authors consider it as a component of an individual’s TP. Still, in our opinion this concept presents a high resemblance to the concept of temporal orientation, since both are referred to as individual’s active use of a specific temporal frame or a
combination of them in the present moment. The reported results are positive concerning its factor structure and several validity aspects (construct, convergent, discriminant, and predictive). Yet, we must highlight that the concept of temporal focus is not as wide as the concept of TP, so we further believe that its predictive value will not outgrow TP’s.

Among the varied temporal concepts that we have explored in this chapter, we would like to stress two aspects of TP that define very well the extent and importance of its influence not only on behavior but also on several important cognitive processes. The first aspect is concerned with its contribution to the cognitive process of retrieving memories from past events or from motivational objects located in the past, present, or future. That process is highly dependent on the individual’s temporal profile or, in other words, on which temporal frame the individual relies on the most. This is because the preferred temporal frames serve as a cognitive-affective filter, which helps in the determination of which memories should be retrieved or which motivational objects should be accessed. All the information, events, memories, or motivational objects that must be encoded, stored, and retrieved are affected by the configuration of the individual’s temporal profile.

The second aspect refers to TP’s flexibility, since as referred to by Zimbardo and Boyd (1999), as well by other authors, TP is a relatively stable trait, but is also affected by cultural, educational, religious, social, and family variables, and this effect is constant. Thus, TP is a dynamic process constantly affected by other environmental forces, which in turn are affected by TP, at least at a representational level, which brings us back to the former aspect.

Considering those two aspects, it is our understanding that TP is a cognitive-affective-motivational process involved in organizing most of the stimuli that our perceptive system receives, as well as the cognitive inputs–outputs that our cognitive system processes. It is also a process that modifies itself according to the environmental influences, but impacts those same influences in return. We illustrate TP functioning as a feedback process, represented in Fig. 8.1 as an infinite loop in which the present stimuli are both interpreted and affected by past memories and future goals and aspirations, while those same present stimuli have the ability to modify the information contained in the past and future temporal frames.
As we can see, each new model of TP brings new dimensions and properties to be considered, and this is an expression of the health and dynamism that this field of study possesses at this moment. Yet, there is a long row to hoe if we want to achieve a model that truly represents all the aspects within TP, with both a domain-general and a context-specific outlook.

It is important to keep in mind a subtle but important difference between the psychology of time and subjective temporality. We consider the psychology of time as the broad field that encloses all the studies concerning the time experience at all its levels. Within the psychology of time we can include the four levels proposed by Vásquez (2011), which help in organizing the entire human temporal phenomenology. Subjective temporality, on the other hand, should include all the individual cognitive structures that are indirectly related to temporal concepts (such as sensation seeking) or those that are directly related to the temporal experience (such as TP, time orientation, or the CFC), which within Vásquez (2011) taxonomy is referred, or specifically as Time III.

As the studies about subjective time are becoming more precise, some important aspects should be considered in future studies:

1. If we take into account all the instruments mentioned in this chapter, there is a similarity across them—they are self-report questionnaires. This might imply that participants’ responses could be affected by a social-desirability bias or even an emotional bias, in the sense that most of these constructs aren’t undoubtedly defined as stable traits or as emotionally induced states. New measures could include a third-

![Fig. 8.1](image-url)
person assessment component, direct behavior observation, or even the use of new methods such as virtual reality, which could facilitate the combination of quantitative and qualitative approaches. Nonetheless, considering the criteria previously proposed to organize and analyze the assessment techniques presented in this chapter, we can observe that each one of those instruments represents a different combination of values among those criteria.

2. At the conceptual level, it is still relevant to trace the differences and similarities among the several temporal concepts present in the literature, since there is a high degree of confusion and superposition between them. Most studies are being developed using a cross-sectional approach—comprehensible due to methodological, economic, and temporal restraints. Yet, this brings, as a consequence, the existence of very few longitudinal studies being published. Hamilton, Kives, Micevski, and Grace (2003) refer to this fact as an actual limitation in temporal research, because of the restricted current understanding about aging and TP. On the other hand, Lasane and O’Donnell (2005) mention the question of participants’ cultural variations or nonnormative characteristics, which in most cases are not being considered in the assessment of temporal phenomena. Equally important is the elaboration of comparative studies between instruments, promoting synergies that allow us to reach a better understanding of subjective temporality and its subconcepts, as key in understanding human dynamics. In other words, we recommend the development of comparative studies, discussing why the new methods presented are more adequate than the previous, or in which way they might complement already validated instruments. An effort developed in this direction was presented by Ortuño and Janeiro’s (2009) study, when analyzing the differences and complementarities between ZTPI and TPS.

3. Regarding specific contexts of intervention, it’s important to develop new models for understanding a more varied array of psychopathologies, since most studies are focused in anxiety disorders, such as posttraumatic stress disorder (see Zimbardo, Sword, & Sword, 2012) or mood disorders, such as depression (see Kazakina, 2013). In temporal research, it is common to focus mainly on temporal orientation variables. Still, human behavior is not guided only by
this aspect of subjective time; is not enough to consider only the individual’s temporal preferences in order to analyze the person’s cognitions and behavior. New assessment techniques should include a more complete array of temporal dimensions (past, present, and future), but also the properties within these same dimensions (orientation, extension, degree of realism, among others). This need allows us to reiterate the Boniwell et al. (2010) view on the upcoming development of TP inventories (or even subjective temporality inventories) when they consider that not only the individual’s time orientation or preferred temporal frame should assessed but also its dimensions or how we consider more appropriate to denominate its properties.

References


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**Author's Proof**

8 Assessment Techniques in the Study of Time Perspective...


Author's Proof

8 Assessment Techniques in the Study of Time Perspective...


van Beek, W., & Kairys, A. (2015). Time perspective and transcendental future thinking. In M. Stolarski, N. Fieulaine, & W. van Beek (Eds.), *Time perspective theory: Review, research and application* (pp. 73–86). Cham, Switzerland: Springer International Publishing.


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## Author Queries

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