

Present Hedonist  
 Temporal Focus Transcendental Future  
 Present Fatalist Temporal Extension TFTPSPast Positive  
 Nuttin AISS Piaget Fraisse CFCS  
 Motivation AISS TEIC Past Negative  
 Time Perspective SSS TPS MIM ZTPI Lewin Personality  
 Sensation Seeking Time  
 Future Anxiety James  
 Consideration of the Future Consequences  
 Future Time Perspective Future Negative  
 Future

Victor Eduardo Cabrita Ortuño

# TIME PERSPECTIVE STABILITY: STUDIES WITH A MULTIDIMENSIONAL MODEL IN THE UNIVERSITY CONTEXT

Doctoral Dissertation in the scientific domain of Psychology, speciality Motivation and Personality, supervised by  
 Sras. Professoras Doutoras Maria Paula Paixão and Isabel Nunes Janeiro and presented to the Faculty of  
 Psychology and Educational Sciences of the University of Coimbra.

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UNIVERSIDADE DE COIMBRA



FACULDADE DE PSICOLOGIA E DE CIÊNCIAS DA EDUCAÇÃO  
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University Context

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*The future belongs to those  
who believe in the beauty of their dreams.*

Eleanor Roosevelt

Este trabalho é inteiramente dedicado

a todos aqueles que estiveram  
a todos aqueles que estão  
a todos aqueles que vão estar

mas por um mundo inteiro de razões  
especialmente a ti, C\*

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---

At certain time I was walking in downtown of Faro with a good friend of mine and she look at me at says something like "Victor, I don't know how you do it but you are such a strong person", commentary which a reply stating (with a unusual kind of wisdom) that I'm not a strong person, is the people around me that give me strength. I was and I am still truly convinced of this. Is all these people around me that allow me to keep going, to push a little further and is to that all people that I owe my gratitude. I know that is not fair not to mention you all, but is truly impossible to me to achieve that.

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## **Abstract**

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The individual's subjective notions about time represent a vast and relevant topic with strong implications not only for the understanding of human behaviour but also because they function as the backbone for critical cognitive processes and permeate the objects perceptive process. Amongst these very unique and individual notions there is one that has gained tremendous prominence in recent decades and which is called Time Perspective. This construct has been considered for many years as a keystone in the motivational domain, more specifically in the school context and through its future frame or Future Time Perspective. Recent theoretical and empirical developments have also demonstrated the importance of Time Perspective in a wide array of behaviours and cognitions. Yet, although empirically validated by several authors, in different countries and with different methodologies, there is still a lack of information about which external influences affect the stability of Time Perspective as a cognitive process.

In the present work we intend to address the factor structure of Time Perspective with the development of an integrative model of Time Perspective, which combines Zimbardo & Boyd's (1999) 5-dimension model, the Transcendental Future (Boyd & Zimbardo, 1997) and the notion indirectly referred to by Lewin (1965) of Future Negative. This model's predictive and conceptual validity is tested through a series of studies using Structural Equation Modelling in which Time Perspective appears as an important predictor of several well-known psychological traits such as Consideration of Future Consequences or Self-Esteem.

In the present study we also intended to shed light on the issue of Time Perspective stability, testing it through two studies which intend to clarify: i) what are the differences observed in the individuals' Time Perspective when assessed in two different contexts and ii) what the differences observed in Time Perspective after a one-year time period. In other words we intend to explore Time Perspective's contextual and temporal stability.

The obtained results suggest that context has little or no effect on Time Perspective, since no strong differences were found between the assessments in the college and the home context. Regarding the temporal stability of Time Perspective, the results allow us to consider that in a one-year period Time

Perspective is a quite stable construct, since there were no significant differences in any of its dimensions.

**Keywords:** time perspective  
stability  
subjective time

As noções individuais e subjetivas acerca do tempo representam um vasto e importante tópico com fortes implicações no entendimento acerca do comportamento humano, e constituem um pilar para diversos processos cognitivos fundamentais, permeando ainda o todo o processo perceptivo. De entre as diferentes noções acerca do tempo, há uma que tem conseguido um extraordinário destaque nas décadas recentes e que é denominada de Perspetiva Temporal. Este constructo tem sido considerado por muitos anos uma pedra angular no domínio motivacional, mais especificamente no contexto escolar, e principalmente através da sua dimensão de futuro ou Perspetiva Temporal de Futuro. Recentes desenvolvimentos tanto a nível teórico como empírico têm demonstrado a importância da Perspetiva Temporal num amplo conjunto de comportamentos e cognições. No entanto, ainda que este conceito tenha sido validado empiricamente por diversos autores, em diversos países e com diferentes metodologias, continua a persistir uma lacuna relativamente ao conhecimento dos fatores externos que afetam a estabilidade da Perspetiva Temporal como um processo cognitivo global.

No presente trabalho pretendemos abordar a estrutura fatorial da Perspetiva Temporal com a proposta de um modelo integrativo que combina o modelo de cinco dimensões de Zimbardo & Boyd (1999), o Futuro Transcendental (Boyd & Zimbardo, 1997) e a noção indiretamente referida por Lewin (1965) de Futuro Negativo. A validade preditiva e concetual deste modelo foi testada através do método de Modelação de Equações Estruturais, tendo sido demonstrado o importante poder preditivo da Perspetiva Temporal em traços psicológicos tais como a Consideração das Consequências Futuras ou a Autoestima.

Neste trabalho também foi a nossa intenção esclarecer a problemática relacionada com a estabilidade da Perspetiva Temporal, a qual foi verificada através de dois estudos nos quais se tentou responder às seguintes questões: i) quais são as diferenças na Perspetiva Temporal dos participantes quando medidas em dois contextos diferentes e ii) quais são as diferenças na Perspetiva Temporal dos participantes um ano depois da primeira avaliação. Por outras palavras, interessou-nos explorar a estabilidade temporal e contextual da Perspetiva Temporal.

Os resultados obtidos permitem-nos sugerir que o contexto presente tem pouco ou nenhum efeito na Perspetiva Temporal, já que não foram verificadas

fortes diferenças entre as avaliações feitas no contexto escolar e no contexto de casa. Relativamente à estabilidade temporal da Perspetiva Temporal, os resultados permitem-nos considerar que ela se apresenta como um construto relativamente estável, já que não foram encontradas diferenças estatisticamente significativas em nenhuma das suas dimensões.

**Palavras-chave:** perspectiva temporal  
estabilidade  
temporalidade subjetiva

## Resumen

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Las nociones individuales y subjetivas acerca del tiempo representan un vasto e importante asunto con fuertes implicaciones en la comprensión relativa al ser humano pero también estas mismas sirven como pilar para variados procesos cognitivos que son fundamentales, así como también impregna todo el proceso cognitivo perceptual de objetos. Dentro de estas únicas e individuales nociones acerca del tiempo hay una que se ha destacado extraordinariamente de las otras, nos referimos a la Perspectiva Temporal. Este constructo ha sido considerado ya durante muchos años como una piedra de base en el dominio motivacional y más específicamente en el contexto escolar, principalmente a través de su dimensión de futuro o Perspectiva Temporal de Futuro. Recientes avances tanto a un nivel teórico como empírico han demostrado la importancia de la Perspectiva Temporal en un amplio conjunto de comportamientos y cogniciones. Sin embargo, aunque este concepto ha sido validado empíricamente por varios autores, en diferentes países y usando diferentes metodologías, aún persiste una falta de conocimiento relativamente a cuales los factores externos que afectan a la estabilidad de la Perspectiva Temporal como un proceso cognitivo.



En el presente trabajo pretendemos enfocar la estructura factorial de la Perspectiva Temporal a través del desarrollo de un modelo integrativo que combina el modelo de cinco dimensiones de Zimbardo & Boyd (1999), el Futuro Transcendental (Boyd & Zimbardo, 1997) y la noción indirectamente referida por Lewin (1965) de Futuro Negativo. La validez predictiva y conceptual de este modelo es puesta a prueba a través del método de Modelación de Ecuaciones Estructurales, por el cual es demostrado el importante poder predictivo de la Perspectiva Temporal en trazos psicológicos tales como la Consideración de las Consecuencias Futuras o la Autoestima.

En este estudio también fue nuestra intención aclarar la problemática relacionada con la estabilidad de la Perspectiva Temporal, la cual fue verificada a través de dos estudios en los cuales se intentó responder a las siguientes preguntas: i) cuales son las diferencias observadas en la Perspectiva Temporal de los participantes cuando medidas en dos contextos diferentes y ii) cuales son las diferencias en la Perspectiva Temporal de los participantes un año después de la primera evaluación. En otras palabras nos interesa explorar la estabilidad temporal y contextual de la Perspectiva Temporal.

Los resultados obtenidos nos permiten sugerir que el contexto presente tiene poco o ningún efecto en la Perspectiva Temporal, ya que no fueron encontradas profundas diferencias entre las medidas realizadas en el contexto escolar y el contexto hogar. Relativamente a la estabilidad temporal de la Perspectiva Temporal, los resultados nos permiten considerar la Perspectiva Temporal dentro de un periodo temporal de un año es un constructo relativamente estable, ya que no se verificaron diferencias estadísticamente significativas en ninguna de sus dimensiones.

**Palabras clave:** perspectiva temporal  
estabilidad  
temporalidad subjetiva

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## Abbreviations and Acronyms List

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### Concepts

- BTP – Balanced Time Perspective
- CFC – Consideration of Future Consequences
- DBTP – Deviation from a Balanced Time Perspective
- FO – Future Orientation
- FTP – Future Time Perspective
- SS – Sensation Seeking
- TFTP – Transcendental Future Time Perspective
- TP – Time Perspective

### Instruments

- AISS – Arnett Inventory of Sensation Seeking
- BTPS – Balanced Time Perspective Scale
- CFCS – Consideration of Future Consequences Scale
- RSES – Rosenberg Self-Esteem Scale
- SSS – Sensation Seeking Scale
- TEIC – Temporal Extension Inventory of Coimbra
- TFTPS – Transcendental Future Time Perspective Scale
- TPS – Time Perspective Scales
- ZTPI – Zimbardo Time Perspective Inventory

### Statistical techniques

- CFA – Confirmatory Factor Analysis
- EFA – Exploratory Factor Analysis
- KMO – Kaiser-Meyer-Olkin Index
- SEM – Structural Equation Modeling

# Introduction

The genesis of time as a psychological phenomenon can be understood by the constructivist point of view 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/her (innateness), but originates from the interaction of these two components (Piaget, 1986). Also, through Piaget's (1977) experiments, we learned that time is critical in the intellectual development of children, but the opposite is also true: the intellectual development of children is crucial to understand temporal phenomena. In other words the subjective and unique individual' notions about time develop through interaction with the external world (Santos, 1972), more specifically by socializing, modelling, education, cultural and other environmental factors (Seginer, 2003).

With this reasoning in mind, the main goal of this work is to explore the stability of a well-known temporal dimension, that of Time Perspective as conceptualized by Zimbardo & Boyd (1999). As secondary goals, we have defined the linguistic and cultural adaptation of several psychological assessment instruments related to subjective temporality, and also to explore the relation of the dimensions they assess with the concept of Time Perspective.

The present work will be organized into three parts. Part I encompasses a theoretical study about subjective time and we will discuss, among other issues, several temporal concepts putting an emphasis on the concept of Time Perspective (which is central to this work), namely its constituent dimensions (or properties), focusing on the operational model that we used in the several empirical studies that are included in this dissertation. Additionally, we reflect upon the main shortcomings that we have identified in the study of subjective time. Also, a brief exploration is made regarding the relation of Time Perspective with several cognitive and behavioural outcomes, and the issue of the stability of Time Perspective is addressed.

The second part is entirely dedicated to the methodology employed in the studies. Chapter 1 presents the samples of each study, Chapter 2 the instruments employed and Chapter 3 the several procedures and statistical analyses.

The third part of this work will serve to present the obtained results and respective discussion. In Chapter 1 we present the preliminary psychometrical analyses of the several assessment instruments used in the studies. Chapter 2 focuses on the exploration of the relations of an integrative model of Time Perspective with several temporal-related constructs (such as Hope and Consideration of the Future Consequences) and individual trait variables (such as

Sensation Seeking and Self-Esteem). Finally, in Chapter 3, we present the results concerning the stability of Time Perspective.

The last part of this thesis is dedicated to drawing the main conclusions regarding the obtained results.



# Part I

## *Time comprehensive theories*

*“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

## Chapter 1

### *Tempus regit actum*<sup>1</sup>

---

Our intention with this chapter is to provide an introduction to the vast topic which is time and more specifically the study of time in psychology. This chapter will be divided into sub-chapters of which the intent is to facilitate the understanding of the various topics being approached.

The first of these sub-chapters (see 1.1 Tempo... What??? A comprehensive introduction to time in Psychology) will consist of a historical summary about the idea of time, the interest of other sciences in it and more precisely which were the first approaches that Psychologists made in order to conceptualize and operationalize time.

The second sub-chapter (see 1.2 A few subjective temporality-related concepts) will evolve around a number of concepts that are deeply related to subjective temporality and that sometimes are mistakenly referred to as Time Perspective. The concepts analysed are Hope, Sensation Seeking and Consideration of Future Consequences.

---

<sup>1</sup> From Latin "Time governs the act"

In the following sub-chapter (see 1.3 Time Perspective: A core concept for human understanding) we will develop the conceptualization of the concept of Time Perspective, which is central to this research. We are going also to refer to a new approach to the study of Time Perspective which has been evolving in recent years, that is the two possible outcomes regarding the individual's Time Perspective, or individual's temporal profile, which are the Biased Time Perspective and the opposite, the Balanced Time Perspective.

The subsequent sub-chapter (see 1.4 Properties of Time Perspective) will serve as an introduction to the various dimensions of Time Perspective, for example: Extension, Density and Attitude among others. This has been one of the most controversial topics in the study of Time Perspective since different authors consider a different composition for Time Perspective construct.

Sub-chapter 1.5 Our approach to Time Perspective, will function as a presentation to the theoretical model of Time Perspective proposed by Zimbardo & Boyd (1999) but also to its latest development which is the inclusion of a sub-scale regarding the Transcendental Future. Nevertheless, in this sub-chapter we will also address another temporal dimension that we consider pivotal in the study of the individual's temporal profile, which is the Future Negative.

In the next sub-chapter (see 1.6 Measurement techniques) we will summarize what we consider the most important instruments developed to measure Time Perspective and similar concepts such as Temporal Focus. In the

sub-chapter 1.7 Psychological Interventions on TP we will elaborate around the possible interventions aimed at changing or somehow modifying individuals' Time Perspective. The last sub-chapter (see 1.8 Shortcomings in the study of Subjective Time), consist of a brief presentation of several of the shortcomings or deficiencies that we believe exist in the study of Time Perspective and subjective temporality.

### **1.1 Tempo... What??? A comprehensive introduction to time in Psychology**

Time is a concept or a construct that has been intimidating and fascinating humans since immemorial time, as it has an enormous potential for structuring all human experiences (Kant, 1781/1997). Mankind has tried to understand, capture and recreate time and its influence on our daily lives through literary and artistic work, but also through our "newly formed" sciences. Hence, "Time is one of the classic concepts whose study still holds a timeless relevance" (Dias, 2009, p. 42). Time, or more specifically the unique human ability of thinking about the future, has even been considered as a catalyst of our species' success (Husman & Shell, 2008) and certainly can be considered as one of our biggest evolutionary advantage over other species.

Due its complexity, time can be addressed through a philosophical, biological, physiological, physical or psychological point of view (Dubois, 1954). As such, it has been studied over the years by several scientific disciplines, like Philosophy, Physics and Psychology among others (Ortuño & Gamboa, 2009). This fact can be considered both as a strength or as a weakness in the scientific study of time. For example, Lasane & O'Donnell (2005) consider that the study of time through a one-dimensional paradigm represents smaller predictive and explicative power of it.

In the specific case of Psychology, the study of time is as old as scientific psychology itself. Palpable proof of this is the work of the father of modern Psychology, Wilhelm Wundt, about the individual's temporal perception of varied stimuli (Jesuino, 2002). However, Wundt's approach to time was entirely quantitative, in which the most individual and subjective components of time were not taken into account. For him time is an instrument to measure space, but space itself also serves to measure time and both operate as mental magnitudes to be employed in the measurement of another type of magnitude, the individual's sensations and thereby other psychological phenomena (Wundt, 1907).

Thus, William James, the father of Psychology in the United States of America, highlighted the relevance of time through an entire chapter of his book, *Principles of Psychology*.

Later, with Sigmund Freud and Psychoanalysis, attention is drawn to early personal experiences. The individual's subjective past is now an important component defining individual personality and explaining human behaviour and psyche. To Freud (1911, as cited in Lavik, 1969) the most influential experiences in human life are those that occur in one's very first years of existence, since psychosexual development depends on it. If an individual successfully completed the defined stages, he/she would present a healthy psyche, whilst if not, a fixation which is a persistent focus in an earlier psychosexual stage can occur, and these fixations can be behaviourally manifested through the effects of a repetition compulsion. Yet, Freud's theory doesn't consider any type of influence regarding the time yet to come, or future, on present behaviour.

Then, with the advent of Behaviourism, time was devoid of any importance in the psychological panorama, since the causal relation Stimulus-Response is the main area of study; within this paradigm there is no room or need for considering the various motivational processes (Lens, 1988), even those related to temporality.

Lewin (1965) presents a model of time analysis which broke with the dominant paradigm of psychology at the time: behaviourism. He considers that the analysis of the subjective temporal dimensions of past and future have a central importance in the explanation of human cognition and behaviour, as they are always active in the present moment. In this sense, Lewin (1965) postulates that TP is "the totality of the individual's views of his psychological future and

psychological past existing at a given time” (pp. 75). This vision of Time is opposed to the objective or physical approach proposed by St. Augustine and scientifically implemented by several authors through the concepts of time use (Harvey & Pentland, 1999) or time budgets (Robinson, 1999). In fact, it represents a more subjective and individual perspective on time, one which is more related to the world’s relativistic view of I. Newton. In order to study this paradigm several concepts have been proposed throughout the years: time personality, time estimation, time intensity, time urgency, perceived time use, subjective duration of experience or time perception, time congruity, polychronicity and monochronicity and time structure. Time Perspective is one of the latest additions to this great array of concepts.

In the last years this specific dimension of the human temporal thinking has undergone a growing interest from the scientific community (Janeiro, 2012). In the last three decades a line of study of psychological time has developed, based on the assumptions presented by Lewin (1965), but which also considers the influence of time on the characterization and development of societies. So, it is considered that psychological time or Time Perspective - TP shapes not only individuals but also groups and societies. Following the same line, Zimbardo and Boyd (1999) defined TP as the non-conscious process through which personal and social experiences are placed in categories or temporal frames. This helps individuals to give order, coherence and meaning to these same experiences. According to Husman & Shell (2008), Future Time Perspective (but also, Past and

Present related Time Perspectives in our conceptualization of TP) approach to time is not related to the physical phenomenon we experience every day, but is rather conceived as a subjective psychological phenomenon. Time Perspective is a relatively stable personality trait, which can still be affected by social, economic, religious and cultural influences (Zimbardo & Boyd, 1999). Holman & Silver (2005) reported significant differences in individuals' TP and its evolution 3 years after a terrorist attack when taking into account age, level of education, marital and socio-economic status.

Zimbardo & Boyd's model has been quite prolific in the quantity and diversity of studies that have been produced in varied psychology fields. For example, there are various studies that show how Future Time Perspective is associated with adaptive and functional situations, such as: various types of pro-environmental behaviours (Corral-Verdugo, Fraijo-Sing & Pinheiro, 2006; Milfont & Gouveia, 2006), academic achievement (Bembenutty & Karabenick, 2004; Boniwell & Zimbardo, 2004) and vocational development (Janeiro, 2010; Janeiro, 2008; Paixão, 2004). Meanwhile, dimensions like the Fatalistic Present, Past Negative and Present Hedonist (with very high scores) are associated with behaviours that can undermine a healthy developmental trajectory like, for example, risk driving (Zimbardo, Keough & Boyd, 1997), smoking and alcohol consumption (Keough, Zimbardo & Boyd, 1999), cannabis consumption (Apostolidis, Fieulaine, Simonin & Rolland, 2006), procrastination (Ferrari & Diaz-



Morales, 2007) among others. More information about the breakthroughs of TP research in diverse topics of Psychology will be presented in Chapter 2.

Yet, having a quick look into the psychological research about time (objective or subjective), it will be found that there is an uneven distribution of the number of publications about each one of the three temporal frames (past, present and future). Mainly, studies are focused on Future Time Perspective; some are about Present Time Perspective and only a few studies focus on the Past Time Perspective. Regarding this phenomenon Shores & Scott (2007) argue that *"the bulk of time perspective research has investigated the relationship of future and present time perspectives to other psychological constructs and behavioral outcomes. Less empirical attention has been given to past orientations."* (pp. 31).

Probably, one cause for this setting concerning future having much more attention than the other two temporal frames is the influence of well-known authors like Nuttin and Lens (1985), Gjesme (1979; 1983) and Nurmi (1991), who devoted much of their research efforts to studying the influence of Future Time Perspective on individuals' motivation. The first author states that Future Time Perspective is the individual's main motivational space.

This is especially valid when exploring cognitions and/or behaviours profoundly related to planning, anticipation and achievement. But, as demonstrated by Ortuño & Vasquez (2013), Past Time Perspective is an

important predictor of variables such as Self-Esteem (Seema, Sircova, Pork & Baltin, 2010, July). Also, Ortuño et al., (2013c) reported that Past Negative Time Perspective is a significant and moderate predictor of Satisfaction with Life, Interpersonal Relations and Psychological Well-Being. As such, we consider that when studying individuals' Time Perspective it is important to verify the entire personal temporal horizon, since depending on the nature of what we are studying, the different temporal frames can give a different contribution.

### **1.2 A few subjective temporality-related concepts**

It is crucial to consider that regarding the study of subjective temporality, similar designations do exist, sometimes differing only in which element of the temporal thinking they focus on (Aspinwall, 2011). In another scenario, they are concepts which by their own characteristics have a strong association with temporal dimensions. We decided to present some of the concepts that, without being specifically considered as temporal dimensions, have a strong link to time considerations, and are known by their psychological importance.

The concepts to be presented are Hope, Sensation Seeking, Consideration of Future Consequences and Future Anxiety.

### 1.2.1 Hope

Lopez, Snyder & Pedrotti (2003) encountered 23 theoretical models or definitions of Hope. This is a fairly well-known concept to the layman who usually relates it to an affective state regarding possible events (Snyder, Feldman, Shorey & Rand, 2002). In the scope of Psychology C. Snyder is one of the most relevant contemporary authors who has been studying and improving this concept in recent decades. Snyder et al. (1991) defined Hope as *“a cognitive set that is based on a reciprocally derived sense of successful (a) agency (goal-directed determination) and (b) pathways (planning of ways to meet goals)”* (pp. 571). This approach differs from most psychological theories about Hope, in the way that those usually consider Hope as an expectation about the achievement of a desired goal (Averill, Catlin & Chon, 1990; McGeer, 2004, Stotland, 1969). Still, Lopez et al. (2003) consider that this emotion-cognition division is fading and future approaches to Hope will include both as different components of this concept.

The fundamental axis of this theory works around three main concepts (Snyder et al., 2002): 1) *Goals*, which are *“anything that an individual desires to get, do, be, experience, or create”* (pp. 299). 2) *Pathways*, consisting of the individual’s perceived skills to create cognitive ways of achieving its goals. And 3) *Agency*, related to the individual’s cognitions about their own abilities to begin and continue the necessary effort to achieve goals. Pathway and Agency thinking mutually interact in a cognitive process with the intent to pursue and achieve

diverse goals (Snyder et al., 2002). The concept has been employed to explain a wide array of behaviours and cognitions, presenting an important predictive value. Snyder et al. (2002) mention the importance of Hope concerning both physical and mental health.

Tong et al. (2010) comment about several criticisms that have arisen due to the Hope model proposed by Snyder; in our opinion the most interesting is that regarding the difference in the nature of the Hope concept. Most studies have focused on the way that people think about hope, asking participants directly “How hopeful do you feel now?” or “How hopeful did you feel in this event?” (Mauro, Sato & Tucker, 1992; Smith & Ellsworth, 1987) instead of using questions that reflect a different vision of Hope. This is deeply related to Bruininks & Malle (2005) and Roseman, Spindel & Jose’s (1990) studies, which suggest that people’s hope has little to do with goal, agency or pathways thinking. In other words, as mentioned by Tong et al. (2010), it appears that Snyder’s model of Hope, and Hope as usually experienced by people are not so equivalent.

Hope as referred to by Snyder et al. (2002) was considered for years as an affective state. The effort developed by Snyder and colleagues goes precisely in the sense of clarifying the cognitive basis of this concept, in order to work scientifically with it. Still, it was during this transition from the affective approach to the cognitive analysis that interest in temporality appeared. According to the Hope model presented by Snyder, in order for an individual to be motivated

he/she needs to determine which his/her goals are, establish the processes via which he/she can achieve these same goals and still possess the belief that it is possible to be successful in this process.

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 by the Future and Present dimensions discovered 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 (1991) considers that Hope is related not only with the future, but also with the past and the present.

We would like also to make a couple of considerations about the two main components of Snyder's Hope. Pathways is defined as an individual's ability to produce means to achieve certain goals (Snyder et al., 2002). We believe this to be highly related to Future Time Perspective, due for example, to the association reported by De Volder & 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/her

ability to successfully achieve his/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 negative dimensions of Time Perspective (Past Negative and Future Negative), we believe that those dimensions of TP will be equally negatively associated with Agency which is a dimension that would require a certain sense of self-evaluation.

### *1.2.3 Sensation Seeking*

Sensation seeking is described by Zuckerman (1994, p. 27), as a *“trait defined by the seeking of varied, novel, complex and intense sensations and experiences, and the willingness to take physical, social, legal and financial risks for the sake of such experience”*. It is considered as one of the dimensions of the Alternative Five personality model (Zuckerman, Kuhlman, Joireman, Teta & Kraft, 1993) and is referred to as one of the most broadly used constructs in researches about the relations between personality and diverse types of activities, such as sports (Zarevski, Marusic, Zolotic, Bunjevac & Vukosav, 1998). According to

Zuckerman's (2008) ideas, Sensation Seeking as a personality trait emerges from the interaction of innate biological characteristics with environmental influences.

Its relevance as a psychological construct lies in the cognitive and behavioural differences among low and high sensation seekers; the latter usually underestimate risks of potentially dangerous situations and are also more predisposed to engage in risky activities (Zuckerman, 1979; Horvath & Zuckerman, 1993). Still, it's important to consider that not all sensation seeking activities are risky (Zuckerman, 2008); different individuals' socialization environments can guide or suppress a sensation seeking tendency regardless of the situation potential risk (Arnett, 1994).

The origin of this concept is deeply related to two notions proposed by Wundt (1907): the optimal level of stimulation and the optimal level of arousal. Both were integrated into Breuer & Freud's (1955) theory as the constancy principle, which indicates the individual's predisposition to search and preserve an optimal level of excitement or stimulation, anything above or below this optimal level will cause psychological discomfort. The first sensation seeking scale was an attempt to measure differences in the individual's need for stimulation (Zuckerman, 2008).

The concept itself is considered to have a strong biological basis in Zuckerman's conceptualization (Zuckerman, 1994). Yet, Arnett (1994) argues that sensation seeking is heavily influenced by socialization, even if it is partially

mediated by a biological basis. Another difference in Arnett's conceptualization is that sensation seeking does not necessarily represent a willingness to take risks.

The reported empirical evidence points towards sensation seeking (and its sub-dimensions) evolving along the individual's lifespan: it has low levels during childhood, reaches its peak during adolescence and then experiences a decline (Roth, Schumacher & Brahler, 2005; Zuckerman, 1979).

Several inventories have been developed in order to measure this dimension, the most referred to in the literature are: the Zuckerman-Kuhlman Personality Questionnaire subscale, Impulsive Sensation Seeking– ImpSS (Zuckerman, 1994), the Novelty-Seeking Scale (Cloninger, 1987), the Arnett Inventory of Sensation Seeking – AISS (Arnett, 1994) and by far the most employed instrument regarding this concept, the Sensation Seeking Scale – SSS in its varied forms (Zuckerman et al., 1978).

The Sensation Seeking concept has a high discriminatory power between groups, for example Zarevski et al. (1998) using both AISS and SSS inventories found important differences amongst athletes engaged in low or high risk sports in all the inventories' subscales. Sensation seeking is also associated with sexual behaviours, such as the number of partners (Zuckerman, Tushup & Finner, 1976), and according to Hoyle, Fejfar & Miller (2000) sensation seeking is the personality trait most consistently related to risky sex. In the relational aspect,



sensation seeking also serves as an important discriminating factor between unmarried (Thornquist, Zuckerman & Exline, 1991) and married couples' (Schroth, 1991) relationship satisfaction. Still, sensation seeking is not only correlated with risky behaviours; high sensation seekers compared to low sensation seekers prefer explicit sex in TV, movies and magazines (Brown, Ruder, Ruder & Young, 1974), more violence (Lawrence & Palmgreen, 1996; Zuckerman, 2006) and action in movies (Slater, 2003).

Sociodemographic variables do present a significant effect on the sensation seeking overall score, as do novelty and intensity sub-dimensions, yet this effect is small enough to be ignored (Roth et al., 2005).

Regarding its relation with Time Perspective, Zimbardo & Boyd (1999) suggest that Sensation Seeking is an overt construct through which the influence of Time Perspective can be manifest and it is mainly related to present-oriented functioning, as can be observed by its positive and significant correlations with Present Hedonist and Present Fatalist Time Perspectives (Keough et al., 1999; Zimbardo & Boyd, 1999; Zimbardo et al., 1997).

### *1.2.3 Consideration of Future Consequences*

The capacity to foresee one's personal future and mentally 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 *versus* distant outcomes and rewards of our behaviour. For example, some people sacrifice an immediate pleasure or benefit for a distant, subjectively better outcome (e.g.: not eating desert now to be slimmer in the summer). To address scientifically how people respond differently to these dilemmas, the concept of consideration of future consequences was proposed. The study of individual differences in the consideration of future consequences was defined as "*the extent to which people consider the potential distant outcomes of their current behaviors and the extent to which they are influenced by these potential outcomes*" (Strathman et al., 1994, pp. 743). It was shown that the CFC 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 & Boyd's (1999) study, this concept, it was positively correlated only with the Future Time Perspective; the correlation with the other temporal dimensions (Past Negative, Present Fatalist and Present Hedonist) was negative and no correlation with Past Positive was found.

### 1.2.4 Future Anxiety

The Future Anxiety concept was proposed by Zaleski (1996), in which he defined it as *“a state of apprehension, uncertainty, fear, worry and concern of unfavorable changes in a more remote personal future”* (pp. 165). Zaleski, following previous conceptions of Anxiety (Bandura, 1988), defends that Future Anxiety is more a cognitive than an emotional concept. Holman & Silver (2005) understand Future Anxiety as a cognitive (and temporal in our opinion) bias towards the future. This concept has been associated with high levels of stress (Otrar, Eksi, Dilmac & Sikin, 2002). We further agree with Aspinwall (2011) who considers that the concept of Future Anxiety is deeply related to the content of Future Orientation.

### **1.3 Time Perspective: A core concept for human understanding**

In our understanding, one of the most important concepts regarding the individual's temporality is the concept of Time Perspective. First referred to by Frank (1939, as cited in Lewin, 1943), it is a concept related to the individual's life-space and which is not limited by the present time: on the contrary, it includes also the individual's remembered past and the imagined future. The importance of this concept for Psychology is underlined 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 Time Perspective stand out as transitory motivational states which 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 of Time Perspective) over time has evolved from being considered as a motivational state to its conceptualization as a more stable personality trait.

The theoretical framework about Time Perspective proposed by Lewin encouraged an avalanche of studies regarding subjective time (Nuttin & Lens, 1985). Also, it served as the foundation for subsequent theoretical models about subjective time, such as Nuttin & Lens’ (1985) model of Time Perspective.

These authors conceive Time Perspective as a cognitive-spatial concept; cognitive because it is formed by motivational objects or events that exist on the cognitive level of behavioural functioning, spatial because these same motivational objects of events are cognitively located in a temporal continuum. Individuals perceive any of these motivational objects as being located either in the past, present or future even when in fact, physically, those same objects or events are being thought by the individual in the present moment.

In this model Nuttin & Lens (1985) consider that Time Perspective is characterized by its extension, density, degree of structuration and level of

realism but the topic of Time Perspective properties will be extensively discussed in the next sub-chapter.

One of the latest models of Time Perspective which follows Lewin's and also Nuttin & Lens's theory is proposed by Zimbardo & Boyd (1999). This new approach is characterized by a multi-dimensional approach of Time Perspective. While Nuttin & Lens (1985) acknowledge the existence of the past and future temporal frames (or Time Perspectives), they decide to focus mainly in the motivational impact of the Future Time Perspective on present behaviour<sup>2</sup>, whilst Zimbardo & Boyd's (1999) proposal refers to an integrative view of all individual temporal frames, including the past, the present and the future and functioning as a cognitive-motivational process with large implications not only for motivation, but also for objects perceptions.

According to Zimbardo & Boyd (1999) Time Perspective 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 Time Perspective's involvement in all the process of encoding, storing and retrieving of past events as well as in the development of expectations and goals. As such, Time Perspective has a strong impact at both a cognitive and a behavioural level.

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<sup>2</sup> Nuttin & Lens (1985) considered the future as the preferential motivational space of individuals.

We would like to stress two aspects of Time Perspective that define very well the extent and importance of its influence not only on behaviour, but also on several important cognitive processes. The first aspect is concerned with Time Perspective's contribution to individuals in the cognitive process of retrieving memories from past events or from motivational objects located either 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 the most. This is because the same temporal frames serve as a cognitive-affective filter, which helps in the determination regarding 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 configuration of the individual's temporal profile.

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

Considering those two aspects, it is our understanding that Time Perspective is a cognitive-affective-motivational process which is involved in the process of 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 influences those same influences in return. We illustrate Time Perspective functioning as a fed-back process represented in Figure 1 as a infinite loop in which the present stimuli is both interpreted and affected by past memories and future goals and aspirations, while that same present stimuli has the ability to modify the information contained in the past and future temporal frames.

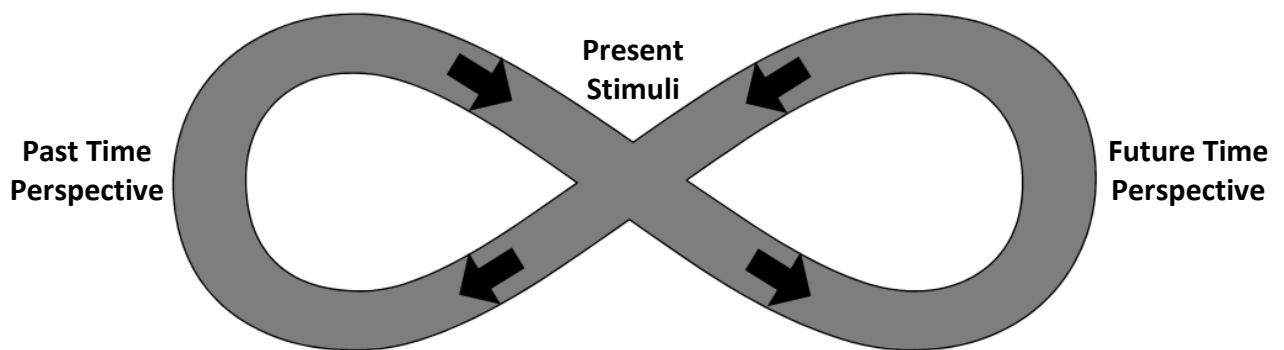


Figure 1. An illustrative model of Time Perspective

### *1.3.1 Biased Time Perspective*

The notion of Biased Time Perspective is contrary to the notion of Balanced Time Perspective, which will be discussed in the next sub-chapter. In

order to understand the process by which an individual develops a bias in a certain temporal frame, we must consider that individuals use the various temporal frames or Time Perspectives as unique and differentiated cognitive styles, through which all the received information and stimuli are processed (Zimbardo et al., 1997) or as Zimbardo & Boyd (1999) state, the process that gives order, meaning and coherence to all internal (personal) and external (social) stimuli. This process is not static and individuals can, consciously or not, select any of the temporal frames (or cognitive styles) to deal with determined information. Still, individuals can develop a fixation regarding the over- or under-utilization of one of these temporal frames, influenced by family, educational, social, religious or/and cultural influences (Zimbardo & Boyd, 1999) and when this personal preference for one temporal frame overcomes the others and becomes chronic it can function as a stable personality trait (Zimbardo et al., 1997).

The result of this process as suggested by several authors (Boniwell & Zimbardo, 2004; Keough et al., 1999; Zimbardo & Boyd, 1999) is that specific temporal categories may be favoured or dominant and others may be used too little, leading people to become temporally “biased” and limiting optimal and healthy psychosocial functioning.

The usual conception regarding an optimal functioning of Time Perspective emphasizes the need for flexibility between the several temporal



frames (Zimbardo & Boyd, 1999), choosing one or another depending on the present environmental demands. For example, an individual biased in the Present Time Perspective is referred to as being mainly focused on a search for immediate pleasure, disregarding the possible future consequences of their present behaviour (Drake, Duncan, Sutherland, Abernethy & Henry, 2008). Contrariwise, individuals with a bias in the Future Time Perspective, are usually referred to as workaholic and unable to enjoy the pleasures of life, holidays and special occasions, since they are always focused on the oncoming projects and goals to be met (Zimbardo & Boyd, 1999).

### *1.3.2 Balanced Time Perspective*

As defined in the last chapters, Time Perspective is a cognitive process composed by several temporal frames, which interrelate between themselves. Most research usually considers how each one of these temporal frames are related and influence several aspects of people's life, but one of the conceptions introduced by Zimbardo & Boyd (1999) refers to "*an idealized mental framework that allows individuals to flexibly switch temporal frames among past, future, and present depending on situational demands, resource assessment, or personal and social appraisals*" (pp. 1272). According to the authors this cognitive background is referred to as Balanced Time Perspective – BTP is central to an

optimum psychological functioning and it is opposed to a dispositional bias towards any particular temporal frame (Drake et al., 2008; Boniwell & Zimbardo, 2003; 2004; Zimbardo & Boyd, 1999). BTP's influence is even broader, since it also contributes to physical health and societal functioning (Sircova, Wiberg, Wiberg & Carelli, 2010, July). Among the factors that influence the development of a BTP, Stolarski, Bitner & Zimbardo (2011) point out coping strategy, emotional control and emotional application.

Since no TP is adaptive across all possible situations that individuals can find in their life, the authors highlight the added value of this broad analysis which consists of a combination of several Time Perspectives when analysing the relation of TP with other psychological concepts. In this case, the interpretation of individual scores is no longer fragmentary across the temporal frames; instead, it is necessary to analyse all the individual's temporal frames as a whole. The junction of all these temporal frames would result in an individualized and unique Temporal Profile, which in our view is composed not only by the temporal orientation, but also by other temporal variables such as: Temporal Extension, Temporal Orientation, Density, Emotional Valence, Continuity and Balance, as proposed by Kazakina (in press; 1999). Yet we must stress the importance of Boniwell et al. (2010) and Kazakina (1999), who argue that there is a lack of measurement tools which consider Time Perspective in all its complexity.

At the behavioural level, individuals oriented by this metacognitive scheme should enforce a compromise between the knowledge of their own past

experiences, their present desires and needs and their future expectations and consequences (Zimbardo & Boyd, 1999). To Boniwell & Zimbardo (2004), the two main mechanisms of a BTP are the flexibility and the ability to change the focus on a determined TP to another more adaptive one, considering the contextual present situation. As such, BTP depends broadly on the present situation, and Epel, Bandura & Zimbardo (1999) refer that *“The optimal time perspective depends upon the demands of the situation”* (pp. 590).

Chronologically, the Balanced Time Perspective concept is addressed once again by Boniwell & Zimbardo in 2004. Here they complement the previous explanations defending that in order to achieve a Balanced Time Perspective, all the individual’s temporal frames should coexist or hold simultaneously without losing the ability to activate a determined temporal frame, taking into account its adaptive value in a given present situation. Complementarily, Boyd & Zimbardo (2005) proposed that a BTP would be characterized by five theoretical TP profiles: hedonistic (high in Present Hedonist and low in Future), fatalistic (high in Present Fatalist, low in Present Hedonist and in low Future), risk-taking (high in Present Hedonist and high in Present Fatalist), future-oriented (low in Present Hedonist and high in Future) and lastly, balanced (high in Present Hedonist and high in Future). Whilst this theorization seems logical and coherent, we still agree with Boniwell, Osin, Linley & Ivanchenko (2010), who state that this work’s empirical validity is still missing. Nevertheless, these same authors tried to find the psychological foundations of these five profiles, and partially encountered

evidence supporting the TP profile structure proposed by Boyd & Zimbardo (2005), and which were hedonistic, future, balanced, negative and risk taking.

Statistically, the Balanced Time Perspective is characterized by moderate values in Present Hedonist Time Perspective, moderate to high values in Past Positive and Future Time Perspectives, whilst presenting low values in Past Negative and Present Fatalist Time Perspectives (Kairys & Liniauskaite, 2010, July). Still this characterization of BTB is not absolute in terms of cultural and temporal contexts, since each culture values different aspects of behaviour, just as it does with the several temporal frames. For example Boniwell & Zimbardo (2004) denote differences in the cultural notion of BTB amongst populations of the United States of America and South Africa. Sircova et al. (2010, July) proposed a way to calculate BTP introducing the idea of Level of Balance; this level is the result of the number of “adequate or adaptive” results in the five Time Perspectives, and as such an individual can score between zero and five regarding their Level of Balance.

Still further, Boniwell et al. (2010) and Zhang, Howell & Stolarski (2013) are acknowledged as the first attempt to empirically operationalize the BTP concept following a proposal by Drake et al. (2008), in which they use cut-off criteria; individuals who score below the 33<sup>rd</sup> percentile in the Past Negative and Present Hedonist Time Perspectives and above this same percentile in the Past Positive, Present Hedonist and Future Time Perspectives would be considered as having a Balanced Time Perspective. Boniwell et al. (2010) criticized this

approach because they consider it to be too dependent on the statistical characteristics of the collected sample, instead of having a basis of psychological differences; therefore, they proposed another method to calculate the participants Balanced Time Perspective, which consists of a cluster analysis, the number of clusters being predefined following the theoretical considerations of Boyd & Zimbardo (2005).

A completely different approach about Balanced Time Perspective is presented by Webster (2011), who proposes a totally new and independent instrument to measure BTP, the Balanced Time Perspective Scale – BTPS, a 28-item inventory organized in two dimensions: past and future. Via this inventory it is possible to categorize participants according to their use of subjective time, such as time expansive, futurists, reminisces and time restrictive. The author found a coherent network of correlations between other subjective temporality related variables, as well as some individual difference metrics. Still, it has been pointed out that one of BTPS's major shortcomings is the lack of a dimension related to the subjective present (Stahl, 2012; Webster, 2011). More details about this inventory are presented in Chapter 1.6 Measurement techniques.

The latest addition concerning the existing methods to evaluate BTP is presented by Stolarski et al. (2011) and then validated by Zhang et al. (2013). This method, named Deviation from a Balanced Time Perspective – DBTP, consists, as the name suggests, of the calculation of a coefficient of *“fit between individuals' time perceptions and the optimal time perspective profile”* (Stolarski

et al., 2011, pp. 354) taking into account Zimbardo & Boyd's (2008) theorization about an adequate temporal profile or Balanced Time Perspective. The proposed coefficient (Stolarski et al., 2011) is shown in the following equation:

$$DBTP = \sqrt{(oPN - ePN)^2 + (oPP - ePP)^2 + (oPF - ePF)^2 + (oPH - ePH)^2 + (oF - eF)^2}$$

In the equation the individual empirical reported value of a determined TP is subtracted from the optimal value for that same TP, and this procedure is repeated for each Time Perspective. The formulation of this equation aims to obtain a normal distribution to capture the deviation of each TP and at the same time to provide a general index of the individual's fit to a Balanced Time Perspective. More details about this equation can be found in Stolarski et al. (2011). The authors state that a DBTP value close to zero indicates a well-balanced time perspective, whilst a large positive value would indicate a serious deviation from the Balanced Time Perspective ideal.

Through a series of comparative regressional analyses, Zhang et al. (2013) defend that among the three most well-known methods of calculating BTP: Drake et al. (2008) cut-off method, Boniwell et al. (2010) hierarquical cluster

analysis and Stolarski et al. (2011) Deviation of Balanced Time Perspective coefficient, the last is the most adequate.

The evidence shown in previous studies suggests that if the Balanced Time Perspective is related to an optimal functioning, the majority of the population hasn't achieved this ideal. In a sample of 260 participants, Drake et al. (2008) reported that only 13 participants achieved BTP (most of the female gender). Kairys & Liniauskaite (2010, July) also reported similar results.

Regarding its associative characteristics, BTP is reported by Drake et al. (2008) as having a positive association with mindfulness, since participants considered as having a BTP presented higher values in these psychological dimensions than those participants who weren't considered as having a BTP. In the same study exactly the same associative pattern of BTP was found but now with a subjective measure of participants global happiness; in both cases the differences were statistically significant. Kairys & Liniauskaite (2010, July) found a relation between BTB and lower alcohol consumption, less frequent smoking, better health evaluation, better evaluation of success in school and the lowest values in neuroticism. Sircova et al. (2010, July) reported that participants with BTP scored higher than the remaining participants in measures of satisfaction with life, psychological well-being, presented better executive functions and scored lowest in measures of depression and psychopathology. Przepiórka (2010, July) reported that BTP participants reported higher entrepreneurial behaviours than those participants without BTP. Using a predictive approach, Zhang et al.

(2013) found that BTP is positively associated with subjective well-being and comes as a valid predictor of it.

Some previous authors had already presented concepts related to the idea of a balanced relationship with time or some objective or subjective temporal variable. Among those is Litvinovic (1998, as cited in Boniwell & Zimbardo, 2004), who presented the idea of a “productive time orientation”, which refers to a temporal continuum between a positive past and a positive future, although it doesn’t consider a positive orientation towards the presents. Other similar proposals were also presented by other authors (Lennings, 1998; Boyd-Wilson, Walkey & McClure, 2002). M. Savickas also presents the notion of Balanced Time Perspective but in a different context; in fact, when analysing the effects that leadership’s temporal functioning has on organizations, Ringle & Savickas (1983) state that leaders should promote an environment in which the tasks of remembering (past), experiencing (present) and anticipating (future) peacefully coexist; this should allow the development of an ideal organizational climate.

The general conception of BTP in western culture is that this is formed by three main components, the Past Positive, the Present Hedonist and the Future (Boniwell & Zimbardo, 2004). Each one of these components is related to different aspects of individual’s lives, therefore all are important in specific situations and, consequently, the ability to switch to one or another TP is



necessary. Boniwell & Zimbardo (2004) also argue that the Past Positive and Present Hedonist Time Perspectives are the temporal frames most related to individual happiness and happy personal relationships whilst the Future Time Perspective appears more related to the individual's notions of well-being, such as hope, optimism, an internal locus of control and others. Still, there are countries where this three dimension model of BTB has not been replicated. Sircova et al. (2010, July) using structural equation modelling tested a three-dimension model, which failed to achieve acceptable global fit indices, yet with a six-dimension solution they found acceptable global fit indices.

As seen through this chapter, several authors recognize the importance of Balanced Time Perspective as an adaptive outcome with deep influences on behaviour and cognitions; several operationalizations have been proposed, but there is a lack of consensus amongst researchers about which are better. However, the majority of the studies, independently of the method used, has presented important results confirming its relevance.

#### **1.4 Properties of Time Perspective**

Several authors argue that Time Perspective must be considered as a one-dimensional construct (Daltrey & Langer, 1984; Gjesme, 1983), yet we defend that Time Perspective is constituted by several and differentiated components or dimensions, as defended previously by other authors (Nuttin & Lens, 1985; Nurmi, 1991).

In fact, one of the theoretical confusions that exist in the study of Time Perspective and other temporal variables is related to the definitions of the several temporal frames and also their properties which all are usually referred to as dimensions. Still, for the sake of avoiding increasing the already existent confusion amongst temporal concepts, we will propose and use the nomenclature of properties (or even characteristics) to refer to what most researches usually consider as dimensions of the Time Perspective (for example: Extension and Density among others). We will consider only and strictly as dimensions of Time Perspective its several temporal frames, which in this work are proposed as the Past Positive, Past Negative, Present Hedonist, Present Fatalist, Future, Future Negative and Transcendental Future. With this clarified, we would like to mention that most research about the Time Perspective construct, its dimensions and properties has focused only on its Future frame or Future Time Perspective (Husman & Shell, 2008; Nurmi, 1989; Peetsma, 2000; Seijts, 1998). Yet, Boniwell et al. (2010) claims that the cognitive and behavioural strategies that can be found in the future temporal frame, can also be found in the past and the present temporal frames; that is, those last temporal frames are

also populated with motivational objects and considering that much of the following properties are related to the structural or even the content component of the psychological experience of time, we consider that much of these should also be considered as part of the past, present and future.

To the present date several proposals have been made regarding which are the properties of the dimensions of Time Perspective. One of the most logical and coherent analyses about the properties of Time Perspective is presented by Nuttin & Lens (1985), but Kastenbaum (1961) also gives a similar presentation about the properties of Time Perspective. The former model is graphically illustrated in Figure 2.

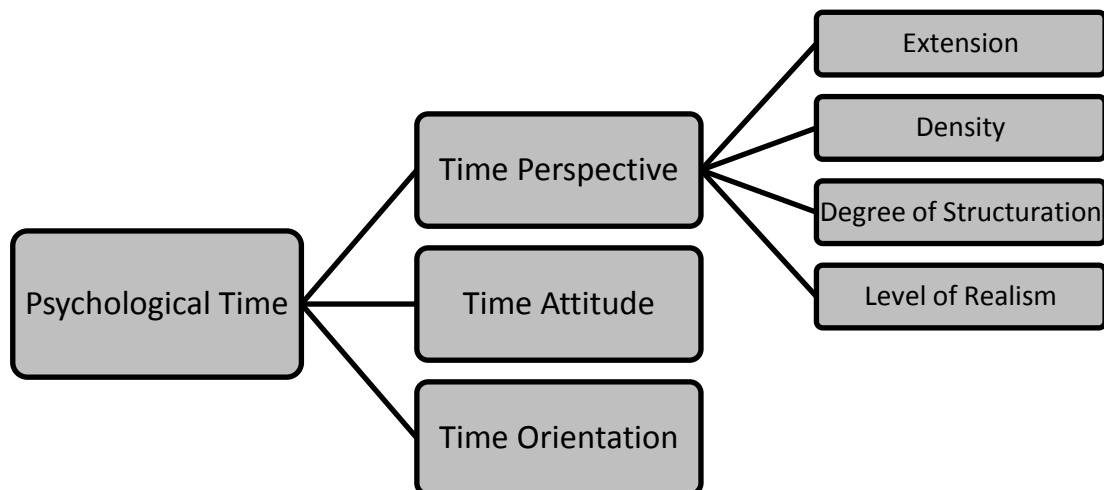


Figure 2. Three constituent aspects of Psychological Time according to Nuttin & Lens (1985)

To Nuttin & Lens (1985), psychological time is formed by three aspects<sup>3</sup>: Time Perspective, which is characterized by its extension, density, degree of structuration and level of realism; the other two aspects forming individual's psychological time are Time Attitude and Time Orientation. Still, even having performed this push for clarification regarding which aspects form psychological time and also Time Perspective, this model has been erroneously reproduced by recent authors. Each one of these aspects will be detailed and approached next.

Another of the conceptualizations that approached only one temporal frame of Time Perspective, more specifically the Future Time Perspective is presented by Husman & Shell (2008). The authors state that FTP is formed by four dimensions: i) Valence: related to the importance that individuals place on future goals, in other words the subjective value of goals, and where a higher value of a goal will imply that the motivation to achieve that same goal is less affected by its temporal distance (Husman & Lens, 1999). ii) Connectedness: defined as the links or associations between present activities and future goals. iii) Extension, that will be detailed explained below in detail and iv) Speed: representing the individual's perception about time's passing or how fast/slow time it is in his/her lives. We consider that some of these dimensions are not directly components or dimensions of Time Perspective – we're referring to Valence and Connectedness which are more than dimensions of TP. They are

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<sup>3</sup> According to Nuttin & Lens (1985) these three aspects are common and mistakenly referred to by other researchers by the exact same term which is Time Perspective.

related to the individual's goals: the first is related to its importance and the second to the utility or adequacy of current behaviour in achieving those same goals. This is important to consider because FTP is more than goals and plans; there are motivational objects that populate the FTP, but other types of motivational objects do exist. Regarding Speed, it appears to be a subjective evaluation that individuals make regarding having or not enough time to fulfil all requested commitments. Our consideration about this TP or FTP structure is that only Temporal Extension (or Extension as mentioned) can be considered as a constituent dimension of TP. This doesn't mean that Valence, Connectedness and Speed cannot be considered as concepts deeply related to the individual's subjective temporality.

Peetsma (2000) considers that Future Time Perspective is formed only by two of the previously referred components, Extension and Valence. Yet there is a crucial difference between Peetsma and Husman & Shell's (2008) conception of Valence: the former considers that Valence is associated with "*the value of a certain object or life domain in the future*" (pp. 178). This definition possesses a wider significance, since it includes not only the importance of future goals but also of motivational objects. Other approaches about which are the components of Future Time Perspective are presented by Seijts' (1998) proposal, which refers to five dimensions: extension, coherence, density, directionality and affectivity. Nurmi (1989) in turn considers that FTP is formed only by three components: motivation, planning and prospective evaluation.

### 1.4.1 Extension

Temporal Extension is a Time Perspective property and is described as the perceived psychological distance between the present moment and a determined motivational object located in the past or the future (Lens, Simons & Dewitte, 2002; Lennings & Burns, 1998; see also Vásquez & Rapetti, 2006); it is also characterized as a cognitive dimension of Time Perspective (Nuttin & Lens, 1985). The first attempt to conceptualize Temporal Extension was proposed by Wallace (1956) as *“the length of the future time span which is conceptualized”* (pp. 240) yet this framing was related only to the psychological future, as noted by other authors (Kastenbaum, 1961; Lennings, 1994; Nurmi, Poole & Kalakoski, 1994). Temporal Extension has been considered by several authors as an important component of Future Time Perspective (Husman & Shell, 2008; Lennings & Burns, 1998; Stouthard & Peetsma, 1999). There are several factors that influence the development of a more extensive Time Perspective such as: societal values and characteristics as well as parental influences (McInerney, 2004) to name just a few.

Still, considering that both past and future time perspectives are psychological constructs related to temporal frames whose content is populated with motivational objects that are more or less distant from the present moment, it makes sense to us to consider that there is also an extension for the Past Time Perspective. Indeed Lennings & Burns (1998) support this idea with their proposal of the definition: *“Temporal extension refers to the perceived distance*

*between the present and an event either in the past or the future*" (pp. 368). In our understanding about the concept of Temporal Extension, it works as a spatio-cognitive component of Time Perspective in which motivational objects can be located in a psychological space which is closer or farther from the present moment.

According to Lens (1993), Temporal Extension influences goals' perceived psychological distance, as well the very instrumentality of those same goals. This being so, Temporal Extension presents a high importance regarding goal conception, prosecution and fulfilment (De Volder & Lens, 1982; Lens et al., 2002), as well it is positive and strongly related to other "temporal phenomena" such as temporal density and coherence (Kastenbaum, 1961). Furthermore, Trommsdorf, Lamm & Schmidt (1979) considered that a longer FTP is associated with better planning for occupational roles. Lessing (1968) showed that a more extended FTP is positively correlated with intelligence, academic achievement, socio-economic status and psychosocial adjustment. Bouffard, Lapierre & Bastin (1989) encountered that the higher the subject's age, the lower the score of Temporal Extension, and the contrary tendency that the higher the subject's schooling, the higher the Temporal Extension score. Surprisingly, no gender differences were encountered.

Concerning Temporal Extension assessment, several psychological instruments have been developed (Kastenbaum, 1961). Among them we can find

story-completion techniques (Kastenbaum, 1961; LeShan, 1952), the Future Personal Time Perspective subscale of the Time Perspective Questionnaire (Lennings, 1991), the Hopes and Fears Questionnaire (Seginer, 1988a), the Rappaport Time Line (Rappaport, Enrich & Wilson, 1985), the Life Events Inventory (Nurmi, 1991), and the Future Time Perspective Scale (Husman & Shell, 2008) among others. Still, the most used and cited instrument by far is the Motivational Induction Method – MIM proposed by Nuttin & Lens (1985). Bouffard et al. (1989) refer to MIM as having sufficient validity, considering that its creator Joseph Nuttin and Bouffard, Lens & Nuttin (1983) encountered around 90-95% and 83% of inter-coder stability respectively, which is very high considering the MIM provided output. Bouffard et al. (1989) also make mention of a few shortcomings of the MIM as a measure of Temporal Extension: i) it was developed to assess conscious motivations (e.g.: goals, aspirations, projects); ii) it is affected by social desirability; iii) it is affected by situational variables, slight experimental variations and personal characteristics. In our opinion MIM has fallen into disuse lately due a couple of reasons: i) MIM's administration and scoring is both consuming and difficult, requiring extensive previous training in order to work with it; and ii) the diminished interest in the Temporal Extension concept over Time Perspective and Time Orientation concepts.

Consequently, there's a lack of an actual option to assess Temporal Extension. It is in this context that the urgency emerges to develop an inventory of Temporal Extension, an inventory that needs to be easy and fast to use and



score, but also needs to present a high conceptual validity. Detailed information about our proposal for an inventory to assess Temporal Extension can be found in sub-chapter 2.5 Temporal Extension Inventory of Coimbra – TEIC.

### 1.4.2 Density

Nuttin & Lens (1985) state that Time Perspective is usually not limited by the presence of only one object in a determined temporal frame and therefore another of Time Perspective's dimensions is Density. Kastenbaum (1961, pp. 206) refers to it as "*how densely populated does the future appear to...*" an individual; according to this same author, the individual's density is limited by their own extension. In other words, density can be considered the quantity of motivational objects that an individual possesses in the certain time frame (Lens, Herrera & Lacante, 2004). Still, this concept has been mostly related to the Future Time Perspective (Nuttin & Lens, 1985), but we believe that, since the Past and the Present Time Perspectives are also populated with motivational objects, the quantity of these same objects can be also quantified. For example, if an individual presents a high quantity of objectives placed in their future, they can be said to possess a high Future Temporal Density.

### 1.4.3 Degree of structuration

Degree of structuration is referred to, by Nutting & Lens (1985) as the presence or absence of bonds between the several motivational objects that occupy the temporal frames. For us, this concept is similar to the concept of Coherence proposed by Wallace (1956), when referring to the extent in which the individual's future events are organized, or in Kastenbaum's (1961, pp. 206) words as "*how well organized or coherent is his outlook...*". The main difference between Nuttin & Lens and Kastenbaum's conceptualization is that the latter borders this cognitive process to the future temporal frame, while the former acknowledges it as part of both the past and the future temporal frames.

### 1.4.4 Level of realism

For Nuttin & Lens (1985) this is an important variable which affects the behavioural effects of Time Perspective, where the more realist a motivational object is in a determined temporal frame, the more intense its effect on overall behaviour. It is also important to note that usually the motivational objects most distant from the present moment are those with a higher probability of having a low effect on behaviour. The degree of realism defines how realist or attainable the objectives outlined by individuals are (Lens et al., 2004). Yet, in our opinion this concept should be extended to all the motivational objects that populate the

individual's temporal horizon, since not only goals can be described regarding their probability to materialize, but also other type of content such as past events and regrets, among others.

#### *1.4.5 Attitude*

Apostolidis et al. (2006) argues the necessity of considering not only temporal orientation but also its – emotional – attitudes when analysing TP relations with risk perceptions. According to Nuttin & Lens (1985) this concept refers to the more or less positive or negative<sup>4</sup> attitude that an individual has towards the several temporal frames (past, present and future). In our opinion this concept is homologous to the concept of valence studied by Husman & Shell (2008) and also by Peetsma (2000). Yet, as previously referred at the beginning of this sub-chapter, we are theoretically more in line with the proposal of Peetsma (2000), who considers it as “the value of a certain object or life domain in the future” (pp. 178). The only addition that we would suggest to that definition is to include not only the future frame but also, the past and the present, following the belief of Nuttin & Lens (1985) that Time Attitude is also related to the past and the present. An individual can, for example, be optimistic about his/her future (which consequently will also represent a positive Time

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<sup>4</sup> According to Lennings, Burns & Cooney (1998) the individual's feelings towards time can be not only positive or negative but also neutral.

Attitude regarding the motivational objects in the future frame) but have a negative view or attitude regarding their present. According to Lennings (1994) Time Attitude is an important variable predicting career maturity (Lennings, 1994).

One of the measurement tools created with the intent of quantifying this concept was the Time Attitude Scale – TAS (Nuttin, 1972, as cited by Nuttin & Lens, 1985); in other words, the TAS was created in order to measure the individual's attitudes towards their personal past, present and future. It is formed by 19 pairs of adjectives (such as pleasant-unpleasant), and participants can fill in the scale using a 7-point response format regarding each of the pairs of adjectives.

#### *1.4.6 Orientation*

This variable is mostly referred to by authors as Time Orientation or Temporal Orientation (Shipp, Edwards & Lambert, 2009). This concept is related, according to Nuttin & Lens (1985), to the individual's temporal preference towards a determined temporal frame. It is defined by Holman & Silver (2005) as *“the degree of cognitive involvement focused predominantly on one time zone”* (pp. 390). According to Gjesme (1983) the temporal orientation developmental process evolves gradually in order to reach a relatively stable state similar to a

personality trait. This process is well documented, especially regarding its future aspect. According to Nurmi (1991) the development of future-oriented motivation is a complex and long-lasting process in which three aspects interplay in core roles, those aspects being: i) The cultural and institutional contexts in which the individual participates and which impose developmental tasks that are related to normative experiences. ii) The social interactions mostly influenced by family and to a lesser extent by peers, which define a cognitive structuration of interests, plans, causal attributions and affects. iii) The individual's cognitive and social development are psychological factors that function as the basis for future thinking and consequently to the development of individual's Future Orientation.

## **1.5 Our approach to Time Perspective**

### *1.5.1 Zimbardo & Boyd's 5-Dimension Paradigm*

Initially, the model proposed by Zimbardo and Boyd (1999) contained five temporal frames or Time Perspectives: *Past Positive*, related to an affectionate, sentimental, pleasant and enthusiastic view of the past; *Past Negative*, related to feelings of anxiety, depression, anger and repulsion towards the past; *Present*

*Hedonist*, which refers to a perspective entirely oriented to the search for emotions, sensations and novelty, with disregard for possible consequences; *Present Fatalist*, which represents a feeling of hopelessness or lack of control over the various events happening today, and is referred as the most destructive and dysfunctional temporal dimension (Drake et al., 2008) and finally, *Future* indicates a strong tendency to create and pursue long term objectives. Future is denoted as the individual's preferential motivational space (Nuttin & Lens, 1985) and as such as been extensively employed in a widespread range of psychological studies, showing its adaptive influence on individual behaviour (Anagnostopoulos & Griva, 2012; Desmmyter & De Raedt, 2012; Gupta, Hershey & Gaur, 2012; Ferrari & Diaz-Morales, 2007; Hamilton, Kives, Micevski & Grace, 2003; Holman & Zimbardo, 2009; Milfont & Gouveia, 2006; Taber, 2013; Zambianchi & Bitti, 2010, July). Still an overuse of any these temporal dimensions can also compromise present enjoyment of life (Boniwell & Zimbardo, 2003; 2004). The result of an extensive overuse of a temporal dimension over the others is referred to as Biased Time Perspective (Zimbardo & Boyd, 1999), and more details about this cognitive pattern can be consulted above in the sub-chapter 1.3.1 Biased Time Perspective.

Jointly these five temporal dimensions have a strong impact on how individuals think, feel and behave, and so a more thorough analysis of how these five temporal dimensions are related to human cognitions, emotions and behaviours is presented in Chapter 2.

### 1.5.2 *Transcendental Future*

As previously mentioned, the initial model proposed by Zimbardo and Boyd (1999) contains 5 temporal frames: *Past Positive*, *Past Negative*, *Present Hedonist*, *Present Fatalist* and *Future*. However, currently, there is a sixth temporal dimension that is also considered in the study of the Time Perspective: the *Transcendental Future* (Zimbardo & Boyd, 1997), a dimension which explores the individuals beliefs about a possible life after the death of their physical body, their characteristics and how everyday actions can influence this supposed life *post-mortem*. This dimension differs from the traditional FTP in the sense that it extends beyond the moment of physical death; traditional FTP does not embrace this subjective temporal mark (it goes from the near future until the end of the physical life). Thus, the Transcendental Future allows us to expand the Time Horizon, to address a unique and – depending on the subject's beliefs – endless time period.

The fact that most people believe in life after death allows them to define goals beyond the period of physical life (e.g.: avoid going to hell; go to heaven or reincarnate into a higher life form) and these goals can influence their current cognitions and behaviours (Zimbardo & Boyd, 2008) in a particular direction and intensity.

Moreover, Boyd & Zimbardo (1997) and Desmyter & De Raedt (2012) mention that few researches exist regarding TFTP, and we would add that it is

probably the least studied temporal dimension in the scope of Psychology at present. We believe this context could be related to several reasons: 1) since TFTP represents a temporal frame that goes beyond physical death, it is impossible for researches to verify any event *a posteriori*. 2) In actual research, TFTP is generally associated with topics heavily related to religiosity, which can – erroneously – give the impression that TFTP is only valuable as a concept in religious topics or with very specific populations. 3) The TFTPS scale was not included in the original conception of ZTPI, which is a highly studied and widespread measure.

A few examples of studies addressing this temporal dimension in the Portuguese context are presented by Ortuño, Paixão & Janeiro (2011a), 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. The same authors (2011b) also found significant differences between religious and non-religious students, in the sense that students that manifest religiousness exhibit higher values in TFTP.

Boyd and Zimbardo (1997) state that it would be unthinkable to place a barrier on the study of psychological time after the death of the individual because it does not objectively exist, since the future, which is referred to by several authors as the preferred motivational human space (Nuttin & Lens, 1985), is also a psychological construct, the result of human imagination, which does not objectively exist, but exists on a representative scenario. As Lee (2009)



explains, we must not allow the boundaries of life space to limit any temporal notions out of this same space.

Given the nature of its content, the Transcendental Future Time Perspective is closely linked with various religions, since many of these are based on the belief of life after death, of an immortal soul or entity which will be rewarded or punished according to their actions on earth and that this transcendental result is eternal and unchanging. Therefore, we should consider the possibility that the analysis that is made by each individual of his/her transcendental future (eternity after death of the physical body) has a strong influence on human cognition and behaviour. However, we believe that this peculiar dimension of subjective temporality cannot be exclusive of religious individuals, but may also exist in individuals who manifest a high degree of spirituality, even if they don't relate to any religious doctrine.

In the specific case of the Portuguese context, there are several historical, social and cultural factors that we believe favour the manifestation of the Transcendental Future Time Perspective. According to Amaral (2010, p. 92), Portugal "has deeply rooted Christian traditions..." and "was born as an independent nation within the Christian Reconquista". It is also important to consider that 83% of the Portuguese population (data from the year of 2000), defines itself as Catholic (Menéndez, 2007). In this same study 92% of Portuguese participants stated they believe in God, while 40% of the participants

also stated they believe in God, While 40% of the participants also stated they believe in life after death.

### 1.5.3 Future Negative

According to Holman & Silver (2005) only a small body of research has addressed what they consider a conceptual gap in subjective time theory, which is the nature of the individual's future orientation. They argue that "*research on future time perspective has focused much less attention on how a negative future orientation may impact overall well-being*" (pp. 390). The same authors highlight the importance of analysing not only the positive valence of Future Orientation but also its negative valence, since this can play an important role – although negative – in understanding an individual's well-being. Ortuño & Vasquez (2013) present empirical evidence about how the negative future (measured by the Time Perspective Scale – TPS, Janeiro, 2012) has an important and negative role in the prediction of the individual's self-esteem. Also, Holman & Silver (2005) reports results that show the association of Fear of Future Terrorism is significantly and moderately associated with psychological distress and negatively with positive affects, and that the Fear of Future Terrorism was a better predictor of psychological distress than Future Orientation.

Some previous attempts to conceptualize and operationalize negative dimensions of future thinking with the concept of Future Anxiety are presented by Zaleski (1996), who refers that almost all kinds of anxiety have an element related to the future. Zaleski (1996) has showed how a negative view towards the future can influence individuals' motivations and behaviours. This author developed the concept of Future Anxiety – FA (a concept that will be discussed in more detail in sub-chapter 1.2.4 Future Anxiety). Nevertheless, at present the overall tendency is to neglect the implications of the negative aspects of the future frame (Carelli, Wiberg & Wiberg, 2011).

When giving his definition of TP, Lewin (1939; 1965) stated that people (regardless of age) are influenced (not only, but also) by how they perceive their future, or in other words, their expectations and hopes, but Lewin also mentioned another component of the Future Time Perspective, the individual's fears. Lewin makes no distinction about the influential power of these three components of the FTP in the cognitive processes and behavioural outputs.

Therefore, considering that both the theoretical approach and the practical operationalization of Time Perspective used in this study are mostly based in Zimbardo & Boyd (1999; 2008) proposals of TP, although with some slight modifications, this proposal has found its very foundation in Lewin's theory of Time Perspective. We believe it fundamental to consider not only the positive aspects that the future has on individuals, but also its more negative and non-

adaptive side. This would allow us to employ a more complex set of temporal dimensions, which we believe will allow a more complete understanding of the implications that Time Perspective has in human actions and behaviour.

## **1.6 Measurement techniques**

Since time, and more specifically subjective time, has been a topic that calls the attention of researchers for so long, several measurement techniques have been developed. In this sub-chapter we will approach the methods of TP assessment that we consider most relevant.

If we take into account a broad conception such as subjective temporality, we can find a large number of tools; still inside this conception there are several constructs that have received more attention than others in the last decades. Some of these concepts are: time orientation, time perspective and sensation seeking. According to Vella (1977, cit. in Lennings, 1994) over 100 methods have been developed in order to measure temporal orientation. McGrath & Kelly (1986) and Boniwell & Zimbardo (2004) also identify the existence of about 211 approaches to Time Perspective.

With such a big array of choices it is possible to organize the instruments using several and different criteria: i) the construct they measure, since the individual's subjective temporality is composed by several variables (such as Time Perspective, Consideration of the Future Consequences and Hope amongst others) and its respective sub-levels, dimensions or properties (like Temporal Attitude, Temporal Orientation for Time Perspective or Future and Immediate for the Consideration of the Future Consequences). ii) their scope, partial or complete regarding temporal orientation – this is particularly important in instruments for assessing TP, in fact, we can find 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 Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999). And last, iii) their theoretical foundation – in fact, we can find instruments like the Thematic Apperception Test – TAT (Wohlford, 1966) or the Circle Test (Cottle, 1976) which are clearly psychodynamically oriented (since the defence mechanism of projection is in the basis of the evaluation system they adopt); on the other hand, we have instruments like the Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999), the Consideration of the Future Consequences – CFC (Strathman, Gleicher, Boninger & Edwards, 1994) or the Arnett Inventory of Sensation Seeking – AISS (Arnett, 1994) which follow a more cognitive approach to time.

Historically, the first group of 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 et al. (2010) defend that these approaches had flaws regarding their validity and reliability. As such, simpler and more objective approaches were developed (Zimbardo & Boyd, 1999), some examples being the Future Anxiety Scale (Zaleski, 1996), the Future Time Orientation Scale (Gjesme, 1979) and the Sensation Seeking Scale – SSS (Zuckerman, 1994); after an analysis of these inventories it is possible to agree with Zimbardo & Boyd (1999) and Boniwell et al. (2010) who state that these instruments clearly represent an improvement regarding statistical indicators but at the expense of presenting lower assessment capabilities, since they are mostly focused on one predominant time orientation.

One of the most influent instruments developed to assess concepts related with the 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 a motivational inducer is printed. These sentence beginnings are formulated in the first person and the verb always expresses a tendency, an effort, desire, intention, etc. The sentence beginnings in the first booklet are formulated in order to induce positive motivational objects (e.g., I intensely desire....) while the second one

asks for negative objects, objects that are avoided, feared, etc. (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 sub-categories, and to 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 time perspective indicators, such as future temporal extension and density (Paixão, Abreu & Lens, 2012).

It has been used in a vast number of research studies, for example Bouffard et al. (1989) found an association between Future Time Perspective, socio-economic status and level of schooling. It has also been used to assess differences in time perspective in adolescence, young adulthood and adulthood in different groups, as well as FTP association with several psychological and behavioural constructs (Paixão, 1996; Vásquez & Rappetti, 2005). Still, this instrument has lost popularity in recent years to shorter and easy to interpret cognitive instruments.

In the last three decades very few instruments have been proposed in order to assess concepts related to the individual's subjective temporality. Some

of the few are the Balanced Time Perspective Scale – BTPS (Webster, 2011), the Temporal Focus Scale – TFS (Shipp, Edwards & Lambert, 2009), the Time Perspective Scales – TPS (Janeiro, 2012) and the well-known Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999) which will be addressed in more detail in Sub-chapter 2.2 Zimbardo Time Perspective Inventory – ZTPI.

The other above mentioned inventories will be briefly addressed next: the Balanced Time Perspective Scale – BTPS (Webster, 2011), 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, which is referred to as an important metacognitive construct with strong influences on positive cognitive and behavioural dimensions (Boniwell et al., 2010; Drake et al., 2008; Epel et al., 1999; Zhang, et al., 2013; Zimbardo & Boyd, 1999). However, although it appears to be a psychometrically and conceptually valid instrument, the BTPS still lacks dimensions to measure the subjective present (Stahl, 2012); we consider that any valid conceptualization of Balanced Time Perspective should include dimensions related to the three archetypal temporal frames (past, present and future). We would also like to consider the Deviation from a Balanced Time Perspective – DBTP coefficient proposed by Stolarski et al. (2011) and Zhang et al. (2013), which in our opinion appears to be a valid and reliable solution to calculate the Balanced Time Perspective that does not require any additional inventory to the data collecting sessions.



The Temporal Focus Scale – TFS (Shipp, Edwards & Lambert, 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”* (pp. 1), and as such the authors consider it as a component of individual’s Time Perspective. Still, in our opinion this concept presents a high resemblance with the concept of Temporal Orientation, since both are referred to the 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 Time Perspective, so we further believe that its predictive value will not outgrow Time Perspective.

Concerning the Time Perspective Scales – TPS (Janeiro, 2012), and considering the results presented by its author, the TPS appears to be a valid and reliable instrument to measure not only Time Perspective in its three temporal frames, but also the temporal extension and temporal affectivity regarding Future Time Perspective. We can only mention two drawbacks regarding this instrument: it lacks two dimensions to assess the temporal affective valence regarding the Past and the Present Time Perspectives, and it is still not culturally adapted to languages other than Portuguese. More information about this instrument can be found in Sub-chapter 2.6 Time Perspective Scale – TPS.

To finalize this sub-chapter concerning the measurement tools employed in the study of Time Perspective and other temporal variables, we would like to partially address Boniwell et al. (2010) who state that Time Perspective inventories to be created in the future should consider not only the individual's time orientation or preferred temporal frame, but also its dimensions.

### **1.7 Psychological Interventions on TP**

The Time Perspective construct as defined by Zimbardo & Boyd (1999) is considered as a relatively stable dimension, yet it can be affected and changed by external influences of a social, political, religious or economical order. After reviewing the literature regarding interventions on TP, we consider that the proposed TP interventions can be grouped into two main categories, which are defined according with their goal: to extend and deepen an individual's Future Time Perspective or to fully develop and balance the entire individual's temporal profile.

The earliest proposals are more oriented to the former group; Lens & Tsuzuki (2007) defends that students' Future Time Perspective must be developed, since with this expansion they can formulate their own goals and

longer and more elaborated means-ends structures. This belief can be considered as the basic reason for intervening in individuals' TP, and more specifically, Future Time Perspective – FTP. Thoms & Blasko (2004) explain that Future Time Perspective can be manipulated through training, even when considering that this temporal dimensions is relatively stable due its cultural and personality foundations as well the individual's developmental stage.

On the topic of career development and following Savickas (1997) theory regarding the importance of Future Time Perspective in career adaptability, Ferrari, Nota & Soresi (2012) elaborated and tested a 10-session intervention, with the purpose of increasing adolescents' ability to project into the future. The results presented confirm the difference in future thinking (measured by the Long-Term Personal Direction Scale - LTPD) between the control and the experimental group. The intervention basis was didactic sessions, which allowed participants to comprehend several psychological theories deeply rooted in future thinking, such as the theory of decisional conflict (Janis & Mann, 1977, as cited in Ferrari et al, 2012), interests, self-efficacy, objectives, decisional strategies and others.

An earlier attempt to modify or intervene in individuals' Time Perspective in the career context was tested by Marko & Savickas (1998). The principal goal of this intervention was to develop participants' Future Orientation, the intervention program consisting of three very distinct phases: *Orientation*, whose

intent was to promote Future Orientation and create a sense of optimism towards the future; *Differentiation*, which attempted to create a sense of reality about the future, and develop positive attitudes towards planning activities as well as towards the definition of goals; *Integration* – in this last phase the objective is to cognitively connect participants' present behaviour with future outcomes, practise the newly acquired planning skills and develop more awareness about their own career. In this study the authors indicated that the experimental group presented significant increases in its Future Orientation and optimism towards the future. The importance of this type of interventions focused on developing future thinking in career contexts lies in the development of Future Orientation in clients who are not oriented to this temporal frame. Marko & Savickas (1998) point out that most contemporary career interventions meet their goals when the clients are already future oriented, while those who are not future oriented fail to harness the benefits of these types of career interventions. A similar intervention was tested by Neto (2009), who, following the structure proposed by Marko & Savickas (1998), prepared an intervention program with college students. The results were mixed, since the author found an enhancement regarding career attitudes but no differences were found regarding Time Perspective, which in this case was assessed by the Time Perspective Scales – TPS (Janeiro, 2012).

Regarding the topic of health promotion, Hall & Fong (2003) developed three (30-minute long) weekly sessions, in which participants were instructed

about the long-term implications of their current behaviour. Beyond this intervention group, there was also a no-treatment group and another intervention group, so-called goal setting control intervention, in which participants participated in a standard cognitive-behavioural intervention, containing no components related to long-term time perspective. Comparing these three groups in relation to the number of hours the participants dedicated to vigorous physical activity, it was encountered that those who received the Time Perspective intervention were those who reported a higher number of physical activity hours both in the post-intervention, as well in the 10 weeks' follow-up. This study demonstrated how an intervention focused on enhancing participants' long-term Time Perspective presents better results than a goal-setting intervention or to the no-treatment group regarding the promotion of physical activity. Nevertheless, considering the content of the intervention and its own main goal (developing a more long-term Time Perspective) this intervention, while productive, is another example of interventions based on one temporal dimension.

In a psychiatric context and with the objective of decreasing suicidal thinking through the development of realistic future thinking and reducing hopelessness, van Beek, Kerkhof & Beekman (2009) created a 10-session weekly training group. The sessions presented a practical and educational approach in which dysfunctional individuals' cognitive aspects such as dichotomous thinking and external locus of control were dismantled. The authors also state that

developing patients' Future Time Perspective can help them overcome dysfunctional behavioural and cognitive patterns. An advantage of this clinical intervention is that it was created considering the possibility of being used in different types of comorbid psychological disorders; still no results were presented regarding the differences in the efficacy of this new therapeutic approach, nor a comparative overview.

Concerning interventions based on a broader approach to the individual temporal profile, in other words not based on only one temporal dimension, the proposals referred in the scientific literature are few. These proposals are very recent theoretical developments that are deeply rooted in the concept of Balanced Time Perspective (Zimbardo & Boyd, 2008). The objectives of this type of intervention go beyond the modification of a single time dimension to focus on a more complete view of the individual's temporal profile.

Kazakina (in press) in her psychotherapeutic, presents a framework which considers not only the client's Temporal Orientation, in its psychotherapeutic practice but also several dimensions of Time Perspective, such as: Temporal Extension, Temporal Density, Emotional Valances and others. Yet, to Kazakina the central notion for a temporality-based psychotherapy is the concept of Balanced Time Perspective, which considers it "*critical for setting clinical goals in treatment and psychotherapy*". In her work Kazakina (in press) doesn't mention an empirical analysis of the efficacy of the proposal for a temporality-based

psychotherapy, but we consider that this model adds an important value not only in the interventional context but also in the theoretical context, due to the bridges that it creates between several temporal concepts and how it tries to interconnect those concepts in a whole and coherent model.

One of the latest additions in this type of intervention is proposed by Sword, Sword, Brunskill & Zimbardo (in press). These authors propose Time Perspective Therapy – TPT, which is a cognitive-narrative therapy; it focus on individuals' perceptions regarding their past, present and future and aims to measure and identify clients' six Time Perspectives (according to the conceptualization of Zimbardo & Boyd, 2008) in order to intervene in each one of those temporal dimensions and develop a Balanced Time Perspective. This would result in a more extended and positive Future Orientation, a more adaptive present and a less negative and traumatic past. The authors argue that this therapy can be adapted to several psychological disorders, but it was originally developed as an intervention for war veterans suffering from Post-Traumatic Stress Disorder – PTSD.

## **1.8 Shortcomings in the study of Subjective Time**

As in any other science, in psychology and within temporal research, shortcomings do exist, yet it is important for us as academics to identify them in order to overcome them in future researches. In this topic, we intend to identify several important shortcomings in this field of study.

Previously, Paixão (1996) stated that in the domain of the study of human temporality, a multiplication of the theoretical, methodological and practical perspectives has occurred; this panorama raises difficulties to a possible effort of developing a coherent discourse about which is the better paradigm, and currently these problems are far from being resolved. Other difficulties researchers find today are related to a lack of integrative studies that consider not only the individuals' future but also their past and present temporal frames. These and others shortcomings are discussed next.

### *1.8.1 How many Time Perspectives exist?*

A key barrier to the development of research and knowledge in Subjective Time and more specifically in Time Perspective topics is the vast aggregate of definitions and operationalisations that this concept has presented throughout the years. As Wallace (1956) points out, several temporal concepts such as time sense, time orientation, time perspective and time perception are frequently used without a proper conceptual and operational characterization.



As a consequence, it has been complex to reach a consensus among researchers about how many temporal dimensions exist (Gupta et al., 2012) and which ones really matter in the study of human behaviour. Even the term “perspective” possesses various non-technical meanings, which have contributed to the existing conceptual confusion (Nuttin & Lens, 1985). Gjesme (1983), when analysing the Future Time Orientation literature concludes that it is possible to support almost any assumption about the association of subjective time with other psychological variables, due in part to the inconsistency in the chosen methods and experimental designs.

One of the most influential authors concerning the psychology of time, P. Fraisse (1957) argues that, given the extensive variety of temporal concepts, it is exceptionally difficult if not impossible to unify all the “temporal phenomena” into a coherent and integrative model of human subjective temporality. Kastenbaum (1961) further complemented this idea, arguing that *“there is much that could be accomplished in this direction by exploring the interrelationships between future time perspective and certain other temporal variables”* p. 215.

It is usual as well as recommendable that in any field of science, several paradigms co-exist, yet numerous problems still do persist: I) in several cases, it is not really a new paradigm or concept that is being introduced, but a simple rebranding of old and well-known concepts, such as the ideas presented by Shipp et al. (2009) regarding the concept of Temporal Focus. II) The contrary is also true, frequently different concepts are being presented as Time Perspective,

causing a totally mistaken perception about the concept amongst readers and researchers. For example Arnocky et al. (2013) considered the concept of Consideration of Future Consequences – CFC as Time Perspective.

It is of vital importance to trace the differences among the several temporal concepts, in order to avoid misconceptions. Regarding the aforementioned case, it must be considered that the concept of Consideration of Future Consequences is a cognitive–motivational construct and has been successfully used as an individual-differences metric in the same way that Time Perspective has. Still, CFC consists of an evaluative dimension of the future, since *“it enables an individual to perceive what his or her future field might require or demand behaviorally, in order to reach desired outcomes”* (Petrocelli, 2003) and is mainly related to behavioural consequences, whilst Time Perspective is a more dynamic and multifaceted process due its influence in the encoding, storing and recalling of experienced events (Zimbardo & Boyd, 1999) and motivational objects.

### *1.8.2 The future matters, past and present who knows...*

Zimbardo et al. (1997) state that *“most current research on time perspective is narrowly directed on only the future dimension by relating it to achievement motivation and anticipated action consequences”* (pp. 1020). Taber

(2013) also confirms this, stressing that Vocational Psychology has focused primarily on the relation of FTP with career variables, neglecting the influence of the past and present time perspectives.

Obviously, it is an overstatement to affirm that this panorama constitutes a shortcoming in the study of temporal research, yet it is a limited approach if the researchers' objective is to comprehend the full impact of temporality on individuals' cognitions and behaviours. Future Time Perspective and other dimensions of subjective future are crucial in the study of concepts like motivation and learning (Andriessen, Phalet & Lens, 2006), career planning (Janeiro, 2010; Paixão, 1996, 2004), career decision making (Walker, 2012), academic achievement (De Volder & Lens, 1982), school investment (Peetsma, 2000) and coping (Holman & Silver, 2005) among many others. In fact, Future Time Perspective is deeply rooted in well-known cognitive-motivational concepts and theories, namely expectancy-valence theories, self-determination theory and achievement goal theory (Lens, Paixão, Herrera & Grobler, 2012). Still, as mentioned by Ortuño et al. (2013c) different psychological and behavioural constructs present a different and unique relation with each one of the subjective temporal dimensions. In other words, the subjective future dimensions are not able to explain all the motivated behaviour; due to their nature, some behaviours are better explained by the other dimensions of the temporal horizon – the past and the present.

Until now we have discussed how Future Time Perspective affects or is related to a wide array of cognitions and behaviours, yet several studies enlighten about the value that Past and Present Time Perspectives have in a totally different array of cognitions and behaviours and in which Future Time Perspective has no effect. Those two temporal frames present important predictive capabilities in concepts such as:

- Self-esteem: highly and negatively associated with Past Negative and lacking a strong association with Future (Anagnostopoulos & Griva, 2012; Ortuño & Vásquez, 2013; Zimbardo & Boyd, 1999).
- Satisfaction with life: From a regression analysis with seven temporal dimensions, only Past Negative was an important predictor, presenting a strong association together with a residual contribution of Future Negative and both were negatively associated with Satisfaction with Life (Ortuño et al., 2013c).
- Avoidant Procrastination: whose main predictor and showing a negative effect on it, is Present Fatalist (Ferrari & Diaz-Morales, 2007).
- Risky driving: A dangerous activity which according to Zimbardo et al. (1997) is better predicted by Present Time Perspective (showing a positive effect on it) than Future Time Perspective.

Considering the reported results of all these studies we must underline how important it is that temporal dimensions related to the past and the present

temporal frames show a crucial role in the study of cognitive and behavioural dimensions. The reported evidence demonstrates the conceptual independence of Zimbardo & Boyd's (1999) five temporal dimensions, while it also seems to be shedding some light on the cross-sectional influence of all Time Perspectives across the different domains of the individual's life. As such, regarding the study of subjective temporality, we recommend researchers to employ measurement techniques that allow a multi-temporal assessment, related not only to the future frame but also with the past and present frames.

### *1.8.3 My Time Perspective is bigger than yours!*

As previously mentioned, during the development of the research on Time Perspective, various theoretical paradigms and assessment instruments have been created. According to McGrath & Kelly (1986), there exist 211 different approaches to the concept of Time Perspective. Especially if we consider other temporality-related concepts such as Consideration of Future Consequences (Strathman et al., 1994), Future Anxiety (Zalesky, 1996), Sensation Seeking (Arnett, 1994; Zuckerman, 1990) and also, more current concepts like Temporal Focus (Shipp et al., 2009) which sometimes are confused with Time Perspective itself, certainly the number of TP definitions would be much higher nowadays.

However, this development has not always been accompanied by an effort by the authors to clarify either the uniqueness or the advantages of each new concept in comparison with the existing ones. Nuttin & Lens (1985) noted that the growing body of Time Perspective research in the decade of the 50s brought a “*great terminological confusion*” (pp. 15). Controversially, this tendency has continued in the following years with an ever growing number of temporal concepts or Time Perspective concepts. Almost every new concept is presented as the definitive approach to subjective temporality.

Equally important is the elaboration of comparative studies between paradigms, promoting synergies which allow us to reach a better understanding of Time Perspective as a key concept in human dynamics. It is easily possible to find research about new concepts and their statistical validity, yet authors and researchers haven't exerted the necessary caution in order to determine how these methods can complement the findings of previous and already validated methods.

In other words, we recommend the development of comparative studies, discussing for example why the new methods that are being presented are more adequate than the previous ones, and also why it is relevant to acknowledge in which way they are complementary to already validated research techniques. An effort developed in this direction was presented by Ortuño & Janeiro's (2009) study, when analysing the assessment differences and complementarities between the ZTPI and the Portuguese IPT (or TPS as referred by Janeiro, 2010).

#### *1.8.4 What about tomorrow, will I still be this young?*

Most studies about subjective temporality are 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 et al. (2003) refer to this fact as an actual limitation in temporal research, because of the restricted current understanding about aging and Time Perspective. Also, it is important to consider the statistical limitations of the cross-sectional approach, which is observational by nature. This fact raises difficulties in extracting causal inferences regarding other psychological or behavioural phenomena. For example, in a cross-sectional study developed by Ortuño, Paixão e Janeiro (2011) seven Time Perspectives amongst college students attending different years were compared, in order to analyse differences in TP along the academic course. Although useful in an exploratory manner, using this methodology the authors are unable to truly establish a valid causal relation between TP and development in academic training.

In the longitudinal scope we would like to mention a couple of interesting studies. First, Holman & Silver (2005), studying future-oriented thinking and adjustment after a terrorist attack, observed on one hand a moderate and negative association between Future Orientation and psychological distress, and on the other hand, fear of future terrorism was moderately and positively associated with the same cognitive pattern. The same authors collecting data

three years after the incident reported that subjects who engaged in active coping after the terrorist attacks, showed higher Future Orientation than those who were involved in planning or religious coping.

Second and last, in this brief review of longitudinal studies on TP, Peetsma, Schuitema & van der Veen (2012), exploring the development of FTP amongst secondary school students, reported that students' long and short term FTP regarding school and professional career decreased over a two-year evaluation, while both long and short term leisure time FTP increased in the same time period.

In a similar vein, Hamilton et al. (2003) also mention as a constraint in current temporal literature the fact that the majority of the research studies carried out in the Time Perspective domain use samples which are mostly formed by young adults or adolescents, the main consequence being the small amount of knowledge about age-group differences and how Time Perspective evolves across the individual's life span.

### *1.8.5 We're more than our temporal preferences*

In temporal research it is common to focus mainly on Temporal Orientation variables. Still, human behaviour is not guided only by this variable; is not enough to consider only the individual's temporal preferences in order to



successfully predict behaviour. Other equally important temporal dimensions exist in this endeavour, such as: Temporal Extension, Temporal Density, Degree of Structuration, Level of Realism and Temporal/Time Attitude (Nuttin & Lens, 1985). Thoms & Blasko (1999) suggest that an important ability that allows individuals to successfully plan for the future is to be able to perceive the future optimistically, in other words, the affective sign associated with the Future.

There is no doubt about the impact of Future Time Perspective on motivational processes (Lens & Tsuzuki, 2007; Peetsma, 2000), but instead of studying only the individuals' tendency to think about a determined temporal frame, this knowledge could be complemented with information about how far into the future this thinking goes or how coherent this thinking is.

This shortcoming is deeply related to the measurement instruments that we use in research. Some well-known instruments such as the Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999) are composed by several temporal dimensions like Present Fatalist, which measures not only temporal orientation, but also temporal affectivity (as do the remaining ZTPI dimensions, except Future Time Perspective). Yet, in a study exploring social networks, Holman & Zimbardo (2009) confirm conceptual difficulties regarding Present Fatalist, due its overlapping with negative affectivity. In the case of the Future dimension, it is frequently referred to by other authors as measuring not only temporal orientation but also time management (Webster, 2011) and planning (Worrell & Mello, 2007).

We are not advocating for one-dimension instruments; we believe that temporal instruments can and must measure different dimensions, but it is extremely important to be able to differentiate between each one of them. Each sub-scale should evaluate only one temporal dimension or be totally capable of providing differentiated scores for each dimension. This will allow research on temporal topics to move forward into a new paradigm of higher conceptual validity and consistency avoiding those overlapping conceptual issues.

#### *1.8.6 How Time Perspective came to be*

The evidence about what variables or conditions affect Time Perspective is scarce. Nurmi (1991) presents an interesting theoretical analysis of which variables affect the development of future temporal orientation in adolescents, and Zimbardo & Boyd (1999) also briefly mention some of the stimuli that shape individuals' temporal profile. Yet, there is a lack of comprehensive and empirically validated theoretical models that explain i) the developmental process of Time Perspective, its several dimensions and properties and ii) why individuals overemphasize a specific time zone and how this bias is maintained throughout the individual's life course.

Actually, most research has focused on exploring what variables are predicted by Time Perspective. An effort to explore possible predictor variables

of TP was proposed by Dunkel & Weber (2010), through the use of three levels of personality, life history, life history strategies, Big Five personality traits and identity; they were able to explain between 20 and 55 percent of variance in TP, depending on which of the temporal frames were considered. The authors highlight the importance of this study arguing that individual differences on Time Perspective have been explored as important predictors of a diverse set of psychological variables, yet there is little understanding about the source of these same individual differences in Time Perspective.

The development of explanatory models of Time Perspective would aid researchers not only in knowing how Time Perspective develops and what variables participate in that process, but it would also increase our understanding of the already established relations of Time Perspective with other psychological and behavioural phenomena. As such we consider this as a crucial line of research which researchers should invest in.

### *1.8.7 One study to rule them all*

While in other sciences the use of meta-analysis to summarize results from numerous studies has been a common practice in recent years, in Psychology and more specifically in Time Perspective topics, there is an almost total lack of studies using this technique. Bearing in mind the increasing amount

of research being produced in recent years about Time Perspective, there is an urgent need to: 1) synthesize the results of several related papers; 2) use a macro approach, allowing a broader view about the effects and associations of TP to other psychological and behavioural phenomena; and 3) facilitate the understanding of the current state-of-the-art on Time Perspective research, in order to encourage new researchers into TP-related topics.

Despite the importance and usefulness of meta-analysis as a research method, until the present day, the only meta-analysis regarding a TP topic was carried out by Milfont, Wilson & Diniz (2012), concerning TP and environmental engagement in 19 samples from seven countries (Australia, Brazil, Germany, Mexico, New Zealand, Norway and the United States) forming a composite sample of 6301 participants. The authors found important evidence that supports the key role that Future Time Perspective plays in attitudes and behaviours towards the environment.

Another type of analysis that could help us better understand research trends is bibliometric analysis. This quantitative method is used to analyse scientific and technological literature (De Bellis, 2009), allowing readers to explore the impact of a determined field, paper or author. Thereby, this method could assist researchers in a more complete and meaningful analysis of the scientific impact of specific Time Perspective topics. But it can also facilitate the evaluation of projects or researchers by funding agencies. As stated by Mugnaini, Jannuzzi & Quoniam (2004), bibliometric data serves to point out the fruition of

the R&D efforts, which can be measured by two means: product-barometers (or barometers of efficacy), which are related to more immediate results (such as the number of publications or quantity of patents in a determined period) and impact barometers, which are related to more long-lasting results (like impact factors and scientific developments, among others).

## Chapter 2

### *Time Perspective and...*

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In the words of several authors such as Kant, Lewin and Zimbardo, time is a structure that allow individuals to organize and even to give meaning to their own motivational objects. Therefore time in Psychology has been intensively studied. For us, Time perspective is a general psychological construct which permeates much of human motivation and decision making (Gonzalez & Zimbardo, 1985). According to Carvalho, Pocinho & Silva (2010) there are two contexts in which the influence of TP FTP is most considered in scientific literature: those are education (motivation) and health (promotion of health behaviours and risk prevention).

The aim of this chapter is to summarize the results of several researches in order to establish a repository regarding the different relations that Time Perspective has in different cognitions and behaviours. In order to facilitate the reading of all this information it was decided to present the information organized into a number of domains with the following order:

- Education, achievement and motivation.
- Health and well-being.

- Work environment.
- Pro-environmental behaviours.
- Digital life.

## 2.1 Education, Achievement and Motivation Topics

An ever-changing economy, allied with an uncertain work panorama are imposing new challenges to the work-force around all the globe; more than ever workers must endure a unstable career path with constant progresses and setbacks (Azevedo, 1999). Thus the individual's educational and vocational behaviours today, are more than ever of crucial importance in the construction of a satisfactory life course (Janeiro, 2010). This being so, it is important to consider the role that Time Perspective has in vocational behaviour and counselling.

Janeiro (2010) states that several career development theories had considered Future Time Perspective as a construct of vital importance, yet without a real and reliable empirical validation until the development of numerous works from well-known counselling psychologist and researcher M. Savickas and his colleagues. Still, Taber (2013) states that the past and present time perspectives are not usually considered in the study of career related

variables; only the FTP is considered in career development theories (Savickas, 2002; Super, 1974).

In a study with Portuguese high-school students, Janeiro (2010) exposed Career Planning as positively correlated with Future Time Perspective ( $r = .48, p < .001$ ) and negatively correlated with Present Time Perspective ( $r = -.21, p < .001$ ). In the same study using structural equation modelling, Future Time Perspective was revealed as having an important effect on Career Planning ( $\beta = .63$  in 9<sup>th</sup> graders and  $\beta = .61$  in 12<sup>th</sup> graders). Again, studying a sample of Portuguese high-school students with the Temporal Perspective Scales – TPS, Nobre & Janeiro (2010) encountered positive and significant correlations between Past and Future Time Perspective and adaptive constructs, such as: school adaptation ( $r = .38, p < .01; r = .37, p < .01$ ) and academic well-being ( $r = .28, p < .01; r = .20, p < .05$ ) respectively; but also negative and significant correlations between Negative Future and school adaptation ( $r = -.20, p < .05$ ) and academic well-being ( $r = -.26, p < .01$ ), indicating in this way a critical relation between Time Perspective and school related variables. Ferrari, Nota & Soresi (2010) also reported results that indicate that a higher orientation towards the future in adolescents reveals less career indecision and higher school achievement. As stated by Zimbardo & Boyd (1999), future thinking is deeply related to the development of plans, contingencies and hypothetical scenarios, a fact that would help explain the positive relation of FTP and school adaptation,



which is a highly future-oriented context, a reasoning that also applies to the concept of academic well-being.

But not only career planning is influenced by Time Perspective. Taber (2013) reports that several variables related to the career decision-making process is affected by TP, through a canonical analysis the author found in the first pair of canonical variables (of three with statistical significance) that lower levels of Past Negative, Present Hedonist and Present Fatalist are strongly related to less indecisiveness, dysfunctional beliefs, problems regarding information about self, unreliable information and internal and external conflicts. These results evidence the pertinence of not only Future Time Perspective when studying career related variables, but that past and present dimensions also play an important role in this matter.

In the study of educational topics, is impossible to dissociate those from the motivational approach. Therefore, we propose the examination of some literature regarding how Time Perspective can affect the individual's motivational process. According to Ferrari & Diaz-Morales (2007) there exist various types of forms of Procrastination (Avoidant and Arousal) and both are profoundly related to the different temporal frames, since Avoidance Procrastination presented moderate correlations with Present Hedonist ( $r = .14$ ,  $p < .05$ ), Present Fatalist ( $r = .28$ ,  $p < .001$ ) and Future ( $r = -.53$ ,  $p < .001$ ) and Arousal Procrastination correlated moderately with Past Negative ( $r = .13$ ,  $p < .05$ ), Present Hedonist ( $r = .20$ ,  $p < .01$ ), Present Fatalist ( $r = .31$ ,  $p < .001$ ) and

Future ( $r = -.59, p < .001$ ). Yet, it is important to note that the nature of the relation between TP's and Procrastination is not a predictive one, since in the same study Ferrari & Diaz-Morales, performing a Regression Analysis, detected that the ZTPI's 5 temporal dimensions accounted for a small quantity of the variance of Avoidance Procrastination ( $\Delta R^2 = .03$ ) and Arousal Procrastination ( $\Delta R^2 = .09$ ).

Furthermore, Diaz-Morales, Ferrari & Cohen (2008) reported the same correlational pattern between Avoidance Procrastination and Present Hedonist ( $r = .18, p < .001; r = .13, p < .05$ ), Present Fatalist ( $r = .30, p < .001; r = .19, p < .001$ ) and Future ( $r = -.61, p < .001; r = -.46, p < .001$ ) Time Perspectives but this time analysing male and female scores independently. Also, Past Negative was correlated with this type of Procrastination ( $r = .22, p < .001$ ) but only in male participants. Past Positive was the only temporal dimension without significant correlations with Avoidance Procrastination. Yet, in the same study another type of Procrastination was studied, Indecision or Decisional Procrastination, and was reported to be correlated with Past Positive ( $r = .16, p < .01; r = .18, p < .001$ ), Past Negative ( $r = .38, p < .001; r = .32, p < .001$ ), Present Fatalist ( $r = .31, p < .001; r = .24, p < .001$ ) and Future ( $r = -.47, p < .001; r = -.13, p < .05$ ) Time Perspectives, both in male and female participants respectively.

Also related to the educational process, there is a vast theoretical body that stresses the implications that Time Perspective and especially Future Time Perspective have in student's academic performance (Simons, Vansteenkiste, Lens & Lacante, 2004), yet the reported effects appear through different

contours; for example according to Simons, Dewitte & Lens (2004) FTP doesn't directly affect student's performance, yet it has a direct effect on task orientation in the form of proximal versus distal goal utility, which in turn has a direct effect on cognitive and behavioural dimensions of performance. In a study with basic and secondary school students, Peetsma (2000) found that Future Time Perspective is positive and moderately correlated with investment in school and professional activities, while it correlates negatively with investment in leisure time.

Lastly, Zimbardo & Boyd (1999) argues that students academic dropout and failure is more related to "TP discordance" than intelligence or intellectual abilities. According to these authors the lack of adaption of present-oriented students to a highly-future oriented context such as school has its basis in this type of failure and as such the intervention actions should focus on extending student's Future Time Perspective while decreasing their hedonist and fatalist thinking towards the present moment; still a second type of intervention should be considered aimed mainly at excessively future-oriented individuals in which the focus should be a balancing of the positive temporal frames, while decreasing the negative ones. Ortuño, Paixão & Janeiro (2013a) using the theoretical and methodological framework proposed by Zimbardo & Boyd (1999) found that college students with higher scores in Past Positive and Future Time Perspectives are those who present higher GPA scores, as well the lowest amount of failed courses, while those with higher scores in Past Negative and

Present Fatalist Time Perspectives are those with more failed courses and a lower mean GPA score.

## 2.2 Health and Well-Being Studies

Despite the now recognized importance of the temporal variables regarding psychological and physical health and well-being (Drake et al., 2008), it took a few years until the studies around the theoretical framework proposed by Zimbardo & Boyd (1999) dedicated attention to this aspect of human life. Still, Zimbardo & Boyd (1999) dedicated a lot of attention to the well-being topic in their paper, and amongst the several conclusions they report, we can mention that individuals highly oriented by the Past Negative Time Perspective tend to have few friends while those higher in Past Positive tend to present higher values of Self-Esteem and happiness. More recently, Holman & Zimbardo (2009) found that Past Positive is related to larger social networks, long lasting relationships and more support from them, Present Hedonist was associated with more supportive friendship relations and Future with social networks that include more parental figures and extended family and a higher support from them. On the contrary, Past Negative was related to more social conflicts, less support from parental figures. As such, the authors conceptualize TP as a pervasive

cognitive process that plays an important role in guiding individuals' social behaviour. Yet, the first studies in this topic have focused on the behavioural aspect of health-related phenomena, ignoring the possible association between TP and the cognitive components of health and well-being (Apostolodis, Fieulaine, Simonin & Rolland (2006).

Working with a sample of older cardiac rehabilitation patients, Hamilton et al. (2003) showed evidence that can be considered contradictory, since Past Positive Time Perspective was correlated moderately with a healthy lifestyle ( $r = .29, p < .05$ ), health responsibility ( $r = .30, p < .01$ ), nutrition ( $r = .26, p < .05$ ) and spiritual growth ( $r = .30, p < .01$ ). Yet, in the same sample it was also found that Present Hedonist Time Perspective was also correlated with health responsibility ( $r = .28, p < .05$ ) and interpersonal relations ( $r = .25, p < .05$ ), and Future Time Perspective was also significantly correlated with health responsibility ( $r = .24, p < .05$ ). Yet, although Present Hedonist – at high levels – can be considered an obstacle to responsible behaviour, it is also important to consider its adaptive properties, especially when referring to psychological well-being (Boniwell & Zimbardo, 2004). Also, we consider it important to highlight that the temporal frames related to the individual's past are those that usually have a strong association with variables related to well-being. For example Drake et al. (2008) reported highly significant results of how both Past Positive and Past Negative are correlated with mindfulness ( $r = .13, p < .05$ ;  $r = -.49, p < .001$ ) and happiness ( $r = .21, p < .001$ ;  $r = -.42, p < .001$ ) whilst Future Time

Perspective did not relate with those same dimensions, and a similar associative pattern was reported also in previous studies (Boniwell & Zimbardo, 2004; Lennings, 2000). Likewise, Seema et al. (2010, July) reported that Past Positive ( $r = .20, p < .01$ ) and Past Negative ( $r = -.40, p < .01$ ) correlated with well-being, and the same authors also reported a positive correlation between self-esteem and Past Positive ( $r = .16, p < .01$ ) and Future ( $r = .16, p < .01$ ) and a negative correlation with Past Negative ( $r = -.60, p < .01$ ) and Present Fatalist ( $r = -.35, p < .01$ ). Also studying well-being, Boniwell et al. (2010) found that Past Negative exhibits a strong, negative and significant correlation with participants' well-being, as Past Positive appears also correlate significantly but in a positive way.

Time Perspective has also been stated as an important predictor of the consumption of different types of drugs. Apostolidis et al. (2006) encountered that high values in Future Time Perspective and low values in Present Hedonist Time Perspective are associated with less reported cannabis consumption. It is very interesting to find that in the same paper, the authors found Future Time Perspective as a negative predictor of relativization of consumption risk ( $\beta = .16, p < .05$ ) and positive predictor of drug consumption risk acceptance ( $\beta = .28, p < .001$ ). On the contrary, Present Hedonist Time Perspective is a positive predictor of drug consumption risk relativization ( $\beta = .18, p < .01$ ) and negative predictor of drug consumption risk acceptance ( $\beta = -.19, p < .01$ ). Ortuño (2007) also reported a predictive association of several Time Perspectives and the consumption of different types of alcoholic beverages in college students. Wills,

Sandy & Yaeger (2001) also reported results regarding substance use in elementary school students; they found that FTP was related to higher levels of perceived control and positive affects, and on the contrary PTP was associated with lack of control and negative affects. Again on the topic of consumption, Laghi, Liga, Baumgartner & Baiocco (2012) found that Past Negative and Present Fatalist were positively correlated with binge eating ( $r = .15$  and  $r = .16$  respectively) and binge drinking ( $r = .18$  and  $r = .19$  respectively). On a different tendency the authors also reported Past Positive and Future as being negatively correlated with binge eating ( $r = -.22$  and  $r = -.20$  respectively) and binge drinking ( $r = -.18$  and  $r = -.18$  respectively).

In their well-known study, Keough, Zimbardo & Boyd (1999) encountered in a sample of 2591 participants a consistent correlational pattern between Future Time Perspective ( $r = -.16$ ,  $p < .01$ ), Present Time Perspective ( $r = .34$ ,  $p < .01$ ) and substance use in several samples. Also, only Present Time Perspective exposed serious predictor capabilities of frequency of substance use. In another highly cited study, Zimbardo, Keough & Boyd (1997) studied the relation of Time Perspective with risky driving and again, Present Time Perspective appears as a best predictor of this problematic behaviour in contrast with Future Time Perspective which is still related negatively ( $r = -.15$ ,  $p < .01$ ) but without any relevant predictive power about that behaviour.

Regarding Well-Being, Positive/Negative Affects and Depression in older people, Desmmyter & De Raedt (2012) discovered that Past Negative ( $\beta = -.27$ ,  $t$

= 5.28) Present Hedonist ( $\beta = .34, t = 3.61$ ) and Future ( $\beta = .32, t = 3.17$ ) are important predictors of positive affects ( $R^2 = .32$ ), a result partially confirmed also by Ortuño et al. (2013c), which found a negative association between Past Negative and Well-Being ( $\beta = -.31, t = -3.39$ ), but in a sample of college students. Satisfaction with life was successfully predicted ( $R^2 = .37$ ) by Past Positive ( $\beta = .25, t = 2.72$ ) and Past Negative ( $\beta = -.45, t = 5.39$ ). In a smaller proportion Negative affects ( $R^2 = .15$ ) were positively associated with Past Negative ( $\beta = .31, t = 3.23$ ). And last, Depression ( $R^2 = .38$ ) was predicted by Past Negative ( $\beta = .43, t = 5.28$ ) and Present Fatalist ( $\beta = .29, t = 3.41$ ). Zambianchi & Bitti (2010, July) also reported results indicating that individuals with higher scores in Present Hedonist are those with more propensity to express positive emotions, while those more oriented to the Future have a better regulation of negative emotions and an adequate coping style, which is directly related to problem solving. Other studies also present evidence regarding a positive association between an individual's present orientation and variables such as life satisfaction (Diener et al., 1985), optimism (Lennings, 2000) and general happiness (Kammann and Flett, 1983). Mood is another emotional valence that is interrelated with the subjective experience of time. Stolarski, Matthews, Postek, Zimbardo & Bitner (2013) reported Past Negative as the strongest correlated and most influential predictor of three different types of moods, energetic arousal ( $r = -.36, p < .01, \beta = -.37, p < .001$ ), tense arousal ( $r = .41, p < .01, \beta = .36, p < .001$ ) and hedonic tone ( $r = -.40, p < .01, \beta = -.38, p < .001$ ). The influence of a negative view of one's own past in



well-being is explained by Nolen-Hoeksema (1991) through the concept of depressive rumination, which consists of a downward spiral of ruminative thinking about negative past events, this functioning as a cognitive blockade to a more adaptive future thinking and planning.

Still, before closing this sub-chapter related to studies of importance of TP in the health and well-being topics, we would like to address van Beek, Berghuis, Kerkho & Beekman (2010) who argue that even when the quantity of studies based on health care settings is growing, the quantity of research being done in clinical psychology and psychiatric contexts is sparse. Thus using the Beck Depression Inventory – BDI-II (Beck, Steer & Brown, 1996) they encountered that the BDI-II total score is significantly correlated with Past Negative ( $r = .84, p < .001$ ), Past Positive ( $r = -.64, p < .01$ ) and Present Fatalist ( $r = .39, p < .01$ ), regarding the suicidality subscale the results present the same correlational pattern with the addition of the Future subscale ( $r = -.27, p < .05$ ). Other reported associations were regarding negative correlations between Past Negative, Present Fatalist and Self Control, Identity Integration, Responsibility, Relational Functions and Social Concordance, and a contrary but expected tendency was that Past Positive correlated positively with those five adaptive dimensions.

Considering all this evidence, we believe that TP can be considered as a powerful instrument detecting problematic aspects of individuals' behaviour, and as such it is a valuable resource to be employed in the development of

prevention and intervention programmes. Also, TP, through its interplays between all the temporal frames plays an important role in the development and maintenance of individuals' well-being. Usually Future Time Perspective is considered as the most adaptive and constructive Time Perspective in terms of developing or engaging in positive health behaviours (Drake et al., 2008). Still, it is important to consider that an overuse of this temporal frame can result in added difficulties enjoying the present (Boniwell & Zimbardo, 2003), implying a lower quality of life for individuals. Yet, an overuse or temporal bias for the present temporal frames can result also in adaptive problems for individuals. As previously mentioned Present Time Perspective (in high values) is deeply related to drug (Apostolidis et al., 2006) and alcohol problems (Keough et al., 1999), but also with emotions such as anger, anxiety and depression (Wills, Sandy & Yaeger, 2001). Thus, a growing body of researches defend that in order to fully understand how Time Perspective contributes to Health and Well-Being studies, it is necessary to consider the individual's temporal profile as a whole and not as several compartmentalized temporal frames: this is named Balanced Time Perspective (Boniwell & Zimbardo, 2004; Zimbardo & Boyd, 1999). This concept, its operationalization and main characteristics are better described in Chapter 1.3.2 Balanced Time Perspective.

## 2.3 Work and Organizational Themes

As previously mentioned, Time Perspective is an influential aspect of the individual's life, yet there is an important domain of Psychology in which the research on this topic is scarce; we are referring to Organizational and Work Psychology (Thoms & Blasko, 2004). The same authors point out three reasons for this context: 1) the ambiguity concerning TP definitions; 2) the lack of a highly valid and consistent instrument to measure TP; and 3) the need for a strong theory that relates TP to organizational phenomena. Martín, Ortuño & Vasquez (2013) mention that temporal orientation, time perspective, as well other subjective temporal dimensions show a strong influence explaining work and organizational phenomena.

In the individual facet, Shipp et al. (2009) has proven that a subjective attachment with time has a remarkable impact on organizational commitment Vasquez (2010) and leadership (Escalada, 2010). An analysis of the temporal research on organizational topics will reveal that the bulk of temporal research has used the concept of Consideration of Future Consequences. Yet, still in the individual domain but using a different methodology, Das (1991) revealed Time Perspective as a major influence regarding several aspects of work performance.

Using a recent concept known as Temporal Focus, Shipp et al. (2009) show how high levels of Future Temporal Focus facilitates a better professional

integration, since it is positively associated with job satisfaction and commitment. On the contrary, in the same study it was proven how a high Past Temporal Focus creates difficulties in the individual's professional situation. Studying the relation of Organizational Citizenship Behaviour – OCB with Temporal Focus, Strobel, Tumasjan, Spörrle & Welppe (2013) present results of a regression analysis that confirms how future temporal thinking is of vital importance to explain OCBs that contribute to organizational adaptation and change, more specifically Altruism and Civic Virtue, showing a positive association with these both OCBs. According to the authors this was an expected and logical result, since they defend that OCBs are by nature future-oriented behaviours, because they intend to generate changes in the work context aiming a better future.

Returning to the Time Perspective concept, it has been also satisfactorily employed in labour contexts; still we should remark that even being present in the psychological literature for several decades, it has only recently been introduced in organizational researches (Thoms & Blasko, 2004). Amongst the leadership processes, Thoms & Greenberger's (1998) research shows how higher leader organizational visioning is strongly correlated with Future Time Perspective ( $r = .60, p < .01$ ). This result is also confirmed by Thoms & Blasko (2004) ( $r = .73, p < .001$ ) who propose a theoretical model that explains how Future Time Perspectives function as a temporal anchor in order to facilitate future visioning and consequently, allow the definition and pursuit of goals by organizational leaders. This interaction creates a link between personality

dimensions (self-efficacy, need for achievement, optimism and self-esteem) and organizational skills (planning, resource allocation and goal persistency, motivating subordinates, among others). In the motivational ambit, Van Der Maarel (2011) presents data supporting a profound and positive link between Future Time Perspective and Work Intrinsic Motivation. Also, Przepiórka (2010, July) reported that individuals who scored higher in Present Hedonist and Future Time Perspectives presented a strong intention to develop a business, while participants with higher values in Past Negative and Present Fatalist Time Perspectives, were those who presented a lack of intention in developing their own business. Furthermore Present Hedonist and Future were positively correlated with an intention to develop a business as well as concrete actions towards this objective, whilst Past Negative and Present Fatalist correlated with negatively with those constructs; the Past Positive did not present any relevant correlation.

Among the non-adaptive concepts of individuals' cognitions and behaviours that affect the organizational processes, Time Perspective is still an important concept with important predictive capabilities. Gupta et al. (2012) have shown that four of the five Time Perspective dimensions of Zimbardo & Boyd's (1999) model are statistical significant predictors of labour procrastination, with Present Hedonist as the only dimension that did not contribute satisfactorily to the model. Also important is the abovementioned work of Ferrari & Diaz-Morales (2007) regarding the relation between Time

Perspective and two types of Procrastination (Arousal and Avoidant). The premise of these results is how the future dimensions of Time Perspective are able to prevent procrastination; our understanding is that TP, being highly related to planning tasks, allows individuals to envision their future as well the necessary pathways to fulfil those same tasks, which facilitates the necessary cognitive and behavioural response. This defensive role of the Future dimensions against procrastination can be verified also in Sirois (2004), where a negative and moderate correlation is found between the Consideration of Future Consequences and general procrastination. Moreover the relation between the subjective future (regardless of how it is assessed or which component is considered) and procrastination cover several other aspects of psychological functioning since procrastinators think less about the future (Specter & Ferrari, 2000), usually prefer to attend or consider short-term needs or benefits versus long term (Baumeister & Scher, 1988; Strathman et al., 1994) and also show difficulties in delaying gratifications (Ferrari & Emmons, 1995).

Yet, considering all these studies and results about how individual characteristics affects organizational processes, both Shipp et al. (2009) and Strobel, Tumasjan, Spörrle & Welp (2013) support that the present knowledge about the role of individuals' cognitions about the future in their behaviour as employees is insufficient. Until now, studies have mainly explored how subjective time and more specifically concepts such as Time Focus or Time Perspective influence individual's characteristics, and through this, affect

organizations. But, we believe that the impact of Time Perspective also goes beyond individuals' lives and also directly affects the dynamics of these same groups or organizations. Future studies should also consider the relation of Time Perspective with the characteristics and processes inherent to jobs and organizations, for example: physical job conditions, performance and goal measurement, formal structure, organization size, amongst others. We believe that this possible association is a prolific ground to better understand organizational functioning because for example different job conditions (e.g.: safety and/or comfort) can stimulate employees' organizational future thinking just as loyalty, OCB's and planning just to mention a few, or indeed organizations that already offer these conditions can attract employees who already are future-oriented.

## **2.4 Pro-Environmental Behaviours**

In recent years several social, economic and political circumstances have triggered a pronounced interest in a more sustainable society; not only among the public but also policy-makers and the scientific community are now concerned with the planetary costs that our style of living and making business will leave on our planet and for our descendants. So far, few efforts have been

made to link better environmental practices and behaviours with Time Perspective. The majority of studies relating temporality with sustainable behaviours have been made using the Consideration of Future Consequences Scale – CFCS (see Arnocky, Milfont & Nicol, 2013; Collins & Chambers, 2005; Ebreo & Vining, 2001; Joireman et al., 2001; Joireman, Van Lange & Van Vugt, 2004; Lindsay & Strathman, 1997; Strathman, Gleicher, Boninger & Edwards, 1994).

Milfont & Gouveia (2006) discovered in a sample of Brazilian undergraduate students that Future Time Perspective is positively correlated with environmental preservation ( $r = .21, p < .01$ ) and negatively correlated with environmental utilization ( $r = -.15, p < .05$ ). Also, Future ( $\beta = .18, p < .01$ ), Past Positive ( $\beta = .22, p < .01$ ) and Present Fatalist ( $\beta = -.16, p < .05$ ) Time Perspectives presented significant predictor capabilities of environmental preservation ( $R = .35, p < .001$ ). Also, in a meta-analysis Milfont, Wilson & Diniz (2012) discovered a positive association between Future Time Perspective and pro-environmental behaviours.

Studying water conservation behaviours in a Mexican sample Corral-Verdugo, Fraijo-Sing & Pinheiro (2006) revealed through Structural Equation Modelling – SEM that Present and Future Time Perspectives act as predictors of water conservation ( $\beta = -.20, p < .05$  and  $\beta = .36, p < .05$  respectively).



In a meta-analysis Milfont, et al. (2012), gathering 6301 participants from seven countries, again found a clear positive association between environmental attitudes and behaviour, analysing studies that used the ZTPI and CFCS as temporal measures.

## **2.5 Digital Life**

Today's world's activities are strongly determined by the technologies of information. These technologies have facilitated the flux of data and information between people, no matter how distant they are; often individuals are confronted with new ways to communicate and work. Thus it is important to understand how the utilization of these same resources can enhance or affect the psychological functioning of individuals and consequently these same individuals' groups.

One of the potentials of these new technologies resides in its potential to be used with leisure and entertainment purposes. One example of it are videogames, which have developed greatly since their beginnings, giving users a highly immersive experience, allied with the possibility of interacting with any other user worldwide. In this ambit, Lukavska (2012) shows evidence that

positively relates Present Fatalist Time Perspective with the number of hours played per week ( $r = .21, p < .01$ ) and per session ( $r = .26, p < .01$ ) but also negatively relates FTP with the number of hours played per session ( $r = -.23, p < .01$ ). Controversially, this study failed to encounter an influence of Present Hedonist Time Perspective in this behaviour. Yet, we believe that this lack of association could be related to a totally different outlook regarding the reasons behind extensive playing of videogames. The positive association with Present Fatalist and the lack of association with Present Hedonist makes us believe that playing videogames during extensive sessions is far from being an entertainment activity; instead it would be more related to a type of strategy to manage or avoid some kind of negative mood. This fact, if empirically proved, would represent a new vision about excessive playing of videogames.

We believe this same argument can be extended or applied to the use of the internet. Our basis for such an assumption is based on the Portuguese results presented by Gamboa, Rós, Imaginário & Ortuño (2011, July)<sup>5</sup>, who reported the Present Fatalist Time Perspective as a positive and significant if small predictor of compulsive use of internet ( $\beta = .13, p < .01$ ). Also in the same study Gamboa and colleagues again found Present Fatalist as a significant, positive and moderate predictor of the individual's preference for social interactions through the

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<sup>5</sup> Chittaro & Vianello (2013) also presented results that support the importance of Time Perspective (especially Past Negative and Present Fatalist Time Perspectives) in the prediction of compulsive internet utilization, preference for online social interactions and other behavioral concepts related with a dysfunctional utilization of internet or digital technologies.

internet ( $\beta = .23, p < .001$ ). These results, allied with Present Fatalist individuals' tendency to be associated with low self-esteem, low emotional stability, depression (Zimbardo & Boyd, 1999), suicidality (van Beek et al., 2010) and social conflicts (Holman & Zimbardo, 2009) supports our understanding that the extreme utilization of some information technologies such as internet or videogames allows individuals to escape from undesirable stimuli. However, more research is needed in order to better assess two points: i) exactly what technologies are being used in a excessive way are used as a escape from reality (e.g.: Facebook, Twitter, texting through cell phones, just to mention a few); and ii) what is the nature of the "reality" that individuals are escaping through the use of technologies. Is there a pattern of negative situations that trigger this state or does every individual use these technologies to escape from a unique and personalized set of negative stimuli.

## Chapter 3

### *Time Perspective Stability*

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K. Lewin (1939) work highlights the importance that the social and cultural stimuli have in the individuals' developmental path, as well as in the persistence of most motivational processes, which behaviourally can be expressed either as direct actions or as emotional expressions; consequently, Lewin stresses that *"The instability of the psychologic environment leads, in some respects, therefore, to greater instability of the person"* (pp. 878). Time Perspective is considered by several authors as a relatively stable motivational trait (Lewin, 1965; Peetsma, 2000; Zimbardo & Boyd, 1999) which is affected both by the characteristics of the environment and the individuals' interpretation of those characteristics. Nevertheless, while these external influences are grounded in the present social and cultural context and are bound to have a long term effect on the individuals' temporal profile (Bond & Smith, 1996; Husman & Shell, 2008; Seginer & Halabi, 1991), in the short term, Time Perspective and its several dimensions are considered as being a stable construct (Husman & Shell, 2008; Zimbardo & Boyd, 1999); still this assumption is usually only put to test with test/retest validity of the instruments which assess Time Perspective.

At a developmental level of analysis, and especially with adolescents and young adults, the research on time perspective fosters the comprehension of the processes underlying their psychosocial identity construction (Rappoport, Enrich & Wilson, 1985). Since early on, Lewin (1939) claims that one of the life-span periods in which Time Perspective experiences undergo deep changes is during adolescence, and this is largely the result of the enlargement of the individual's life-space into new and unknown areas; in fact, Lewin defends that the developmental deep change in Time Perspective during adolescence is one of the most fundamental facts at this stage of life. Lewin also argues that the nature of this deep change is related with the scope of Time Perspective, once instead of anticipating the following day or the following week, the individual is now able to set goals which include a more extended temporal frame, such as months and even years; at this stage the adolescents' Time Perspective also differs from children' Time Perspective on its level of realism, since a child can set up goals or motivational objects which belong mostly to the fantasy spectrum. Some of the classical studies regarding children' cognitive skills and motivational abilities are related with the delay of gratification (Mischel, 1981); individual differences which were observed in those studies are now considered as being partially due to differences in the children' Time Perspective (Lens, 1986).

In a later work Lewin (1942) states that the child's motivational space is mostly located at the present moment, and as the individuals grow older both their past and their future frames become more relevant, a fact which in our

opinion can be due to their involvement in critical developmental tasks. According to other authors (Nurmi, Poole & Kalakoski, 1994; Seginer, 1988b) adolescence must be also perceived as a training period for the shift to adulthood, in which the individuals prepare and develop the necessary cognitive processes to fully understand and function in a future temporal frame; this developmental change in the cognitive repertoire can be considered as having a highly adaptive value in the individual's societal functioning, especially in contemporary goal-oriented societies.

Regarding the changes in Time Perspective in later life, we would like to underline that fewer studies have been carried out around Time Perspective issues in older age groups. We agree with Hamilton et al. (2003) who argue that most studies focusing on this subject are carried out with young adult or adolescent samples.

Concerning the changes in Time Perspective in later life, studies generally agree that aging brings a decrease in the importance ascribed to temporal variables in human behaviour (Hamilton et al., 2003; Krajcir & Sundberg, 1979; Lennings, 2000) and this belief has been shared among most researchers in this domain. In fact, authors like Thoms & Blasko (2004) defend that when we consider the individuals' entire life span, Time Perspective's evolution presents a curvilinear form, beginning as narrow in childhood, long in late adolescence and early adulthood and narrow again in later life. However, in other studies with

older groups (e.g. Hamilton et al., 2003) the obtained results highlight the fact that amongst elder populations, Past Positive Time Perspective correlates with several measures of adaptive behavior, while Present Hedonist and Future are also associated with behavioural outcomes, although with less dimensions and with less intensity. Also, Ortuño, Paixão & Janeiro (2013b) consider that this view which emphasizes the lack of importance ascribed to the temporal variables in elders is incomplete, especially when concerning the future temporal frame, because past studies didn't take into account the Transcendental-Future Time Perspective, which seems to expand in later life, helping individuals with a limited prospective time span to function more adaptively in old age. Phan (2009a) also supports the importance of the future temporal frame for the elderly, since in a sample of elder tertiary students Future Time Perspective successfully predicted achievement goal orientations (mastery, performance-approach and performance-avoidance), effort and deep processing strategies. Considering all the information we can conclude that, at the present moment, the reported findings related to this specific age group are far from being consonant among researchers.

But if the quantity of studies which analyse the temporal stability of Time Perspective is low, regarding the contextual stability of Time Perspective the panorama is even more discouraging, since the number of studies focusing on this topic is very scarce. Peetsma (2000) explored the relation between students' Future Time Perspective and their investment in schooling. This author took into

account motivational objects related with four context categories: school and professional, social relations, personal development and leisure time. Peetsma argues that there are several contextual Time Perspectives that are defined in function of their content, which is directly related with the individuals' main life domains. Peetsma argues that there are positive association between the students' academic investment and their Time Perspectives related with school and professional career, while their leisure Time Perspective was negatively associated with academic performance.

Considering the above mentioned information regarding the stability of Time Perspective, we propose the following main research hypotheses:

**Hypothesis 1**

*Individuals' Time Perspective will present different characteristics in different contexts.*

**Hypothesis 2**

*Individuals' Time Perspective will present little or no change after a 1-year assessment.*



# Part II

## *Method*

*Waste not your time, so fast it flies;  
Method will teach you time to win;  
Hence, my young friend, I would advise,  
With college logic to begin.*

*Von Goethe (2004)*

## Chapter 1

### *Participants*

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A total of 821 participants were involved in the different studies of this research project. Of this, 661 (86.4% are female) and 104 (13.6%) are male. Still, due to the several objectives to be accomplished, not all the participants responded to the same set of inventories. As so, the sub-samples of each study will be described in the next sub-chapters.

#### **1.1 ZTPI Confirmatory Factor Analysis**

For the confirmatory analysis of the ZTPI, the sample was composed by 816 participants; which 708 (87.2%) are female and 104 (12.8%) male. The range of ages is between 17 and 61 years old ( $M = 20.10$ ,  $S.D. = 4.97$ ). This sample integrated students from three Portuguese Universities, 629 (77.1%) from the University of Coimbra, 80 (9.8%) from the University of Porto and 107 (13.1%)

from the University of Lisboa. Table 1 presents the distribution of the total sample by course and year.

Table 1. Participants course and year (n = 811)

<i>Variable</i>	<i>n</i>	<i>Valid %</i>
<b>Course</b>		
Psychology	677	83.4%
Educational Sciences	100	12.3%
Social Service	30	3.7%
Pharmaceutical Sciences	3	.4%
Management	1	.1%
Electronic Engineering	1	.1%
<b>Year</b>		
First year	547	67.7%
Second year	142	17.6%
Third year	89	11%
Fourth year	28	3.5%
Fifth year	2	.2%

## 1.2 TFTPES Exploratory & Confirmatory Factor Analysis

The sample was composed by 346 participants, with an age range between 17 and 54 years old ( $M = 19.87$ ,  $SD = 4.27$ ). Regarding gender, 313

(90.7 %) participants were female and 32 (9.3 %) were male. One participant did not respond to this question. All participants are college students of an Integrated Master of Psychology, 186 (54.2 %) the first year of the course, 77 (22.4 %) second year, 77 (22.4 %) third year, 1 (.3 %) fourth year and 2 (.6 %) fifth year. 3 participants did not respond to this question.

### 1.3 AISS Exploratory & Confirmatory Factor Analysis

For the exploratory and confirmatory study of the AISS the sample is composed by 340 participants, of whom 277 (81.5%) are female and 63 (18.5%) are male. The ages range between 17 and 69 years old ( $M = 20.20$ ,  $SD = 5.75$ ). All participants are college students attending the Integrated Master in Psychology ( $n = 261$ ) and the Master in Educational Sciences ( $n = 76$ ). Participants were attending the first ( $n = 212$ ), second ( $n = 124$ ) and third ( $n = 2$ ) year of their degree. All the data was collected in two Portuguese colleges: the Faculties of Psychology and Educational Sciences from the University of Coimbra ( $n = 184$ ) and the University of Porto ( $n = 156$ ).

## 1.4 TEIC Exploratory & Confirmatory Factor Analysis

For the study of the psychometric properties of the TEIC, the sample is composed by 353 participants, all college students, mostly from the Integrated Master in Psychology ( $n = 274$ , 77.8%). The remaining students were in Educational Sciences ( $n = 76$ , 21.6%), Management ( $n = 1$ , .3%) and Electronic Engineering ( $n = 1$ , .3%) degrees. Their teaching institution was the University of Coimbra ( $n = 182$ , 51.6%), the University of Lisbon ( $n = 107$ , 30.3%) and the University of Porto ( $n = 64$ , 18.1%). Regarding participants' gender, 290 (82.2%) are female and 63 (17.8%) are male. Their ages are between 17 and 61 years old ( $M = 20.21$ ,  $SD = 5.30$ )

## 1.5 A New Multidimensional Model of Time Perspective

The sample is composed by 215 participants, mostly college students from the Integrated Master in Psychology ( $n = 178$ , 82.8%). The remaining students were in degree courses in the Educational Sciences ( $n = 27$ , 12.6%), Management ( $n = 1$ , .5%) and Electronic Engineering ( $n = 1$ , .5%), and 8 (3.7%) participants were not college students. Their teaching institution was the

University of Coimbra ( $n = 103$ , 49.8%) and the University of Lisbon ( $n = 104$ , 50.2%). All college students were in the first year of their degree. Regarding participants' gender, 164 (76.3%) are female and 51 (23.7%) are male. Their ages are between 17 and 61 years old ( $M = 19.97$ ,  $SD = 5.39$ ).

### **1.6 The Relation Between Time Perspective and Temporal Extension**

The sample is composed by 215 participants, mostly college students from the Integrated Master in Psychology ( $n = 178$ , 82.8%). The remaining students were in degree courses in the Educational Sciences ( $n = 27$ , 12.6%), Management ( $n = 1$ , .5%) and Electronic Engineering ( $n = 1$ , .5%), and 8 (3.7%) participants who were not college students. Their teaching institution was the University of Coimbra ( $n = 103$ , 49.8%) and the University of Lisbon ( $n = 104$ , 50.2%). All college students were in the first year of their degree. Regarding participants' gender, 164 (76.3%) are female and 51 (23.7%) are male. Their ages are between 17 and 61 years old ( $M = 19.97$ ,  $SD = 5.39$ ).

### **1.7 The Relation Between Time Perspective and Hope**

The sample is composed by 235 participants, all college students from the Integrated Master in Psychology in the University of Coimbra. Regarding the year of the course, 123 (52.8%) participants are in the 1<sup>st</sup> year, 59 (25.3%) in the 2<sup>nd</sup> year, 49 (21%) in the 3<sup>rd</sup> and two (0.9%) in the 5<sup>th</sup> year. Regarding participants' gender, 216 (91.9%) are female and 19 (8.1%) are male. Their ages are between 17 and 45 years old ( $M = 19.38$ ,  $SD = 2.86$ ).

### **1.8 The Relation Between Time Perspective and Consideration of the Future Consequences**

The sample is composed by 215 participants, mostly college students from the Integrated Master in Psychology ( $n = 178$ , 82.8%). The remaining students were in degree courses in the Educational Sciences ( $n = 27$ , 12.6%), Management ( $n = 1$ , .5%) and Electronic Engineering ( $n = 1$ , .5%), and 8 (3.7%) participants who were not college students. Their teaching institution was the University of Coimbra ( $n = 103$ , 49.8%) and the University of Lisbon ( $n = 104$ , 50.2%). All college students were in the first year of their degree. Regarding participants' gender, 164 (76.3%) are female and 51 (23.7%) are male. Their ages are between 17 and 61 years old ( $M = 19.97$ ,  $SD = 5.39$ ).

## 1.9 The Relation Between Time Perspective and Sensation Seeking

The sample is composed by 215 participants, mostly college students from the Integrated Master in Psychology ( $n = 178$ , 82.8%). The remaining students were in degree courses in the Educational Sciences ( $n = 27$ , 12.6%), Management ( $n = 1$ , .5%) and Electronic Engineering ( $n = 1$ , .5%), and 8 (3.7%) participants who were not college students. Their teaching institution was the University of Coimbra ( $n = 103$ , 49.8%) and the University of Lisbon ( $n = 104$ , 50.2%). All college students were in the first year of their degree. Regarding participants' gender, 164 (76.3%) are female and 51 (23.7%) are male. Their ages are between 17 and 61 years old ( $M = 19.97$ ,  $SD = 5.39$ ).

## 1.10 The Relation Between Time Perspective and Self-Esteem

The sample was composed by 473 Portuguese college students (age range: 17 to 61;  $M = 19.67$ ,  $S.D. = 4.10$ ). 408 (86.1%) were female and 66 (13.9%) male. The participants were recruited in the Faculties of Psychology and Educational Sciences of three Portuguese Universities: 356 (75.1%) are students from the University of Coimbra, 103 (21.7%) from the University of Lisbon, and 15 (3.2%)



from the University of Porto. 339 (71.5%) participants are in the first year of their course, 64 (13.5%) in the second year, 54 (11.4%) in the third year, 15 (3.2%) in the fourth year, and 2 (.4%) in the fifth year.

### **1.11 Temporal Changes in Time Perspective**

The sample is composed by 77 participants, of whom 49 (63.6%) are students from the University of Coimbra attending the Integrated Master in Psychology, while the remaining 28 (36.4%) are students from the University of Porto taking an undergraduate degree in Educational Sciences. All participants are in the first year of their college course. Most of the participants belong to the female gender ( $n = 66, 88\%$ ), while only 9 (12%) belong to the male gender. The participants' ages vary from 17 to 54 years old ( $M = 19.21, SD = 4.44$ ).

### **1.12 Context Influence on Time Perspective**

The sample is composed by 38 participants; all are students from the University of Lisbon in the course of Integrated Master in Psychology. All participants are in the first year of their college course. Most of the participants belong to the female gender ( $n = 35$ , 92.1%), while only 3 (7.9%) belong to the male gender. The participants' ages vary from 17 to 26 years old ( $M = 18.92$ ,  $SD = 2.17$ ).

See Table 2 below to a summary of the samples characteristics.

Table 2. Samples Summary

Study	<i>n</i>	Females	Males	Age Range	Mean Age
ZTPI CFA	816	708 (87.2%)	104 (12.8%)	17-61	20.1
TFTPS EFA & CFA	346	313 (90.7%)	32 (9.3%)	17-54	19.9
AISS EFA & CFA	340	277 (81.5%)	63 (18.5%)	17-69	20.2
TEIC EFA & CFA	353	290 (82.2%)	63 (17.8%)	17-61	20.2
A New Multidimensional Model of TP	215	164 (76.3%)	51 (23.7%)	17-61	20
TP Relation with Temporal Extension	215	164 (76.3%)	51 (23.7%)	17-61	20
TP Relation with Hope	235	216 (91.9%)	19 (8.1%)	17-45	19.4
TP Relation with Consideration of the Future Consequences	215	164 (76.3%)	51 (23.7%)	17-61	20
TP Relation with Sensation Seeking	215	164 (76.3%)	51 (23.7%)	17-61	20
TP Relation with Self-Esteem	473	408 (86.1%)	66 (13.9%)	17-61	19.7
Temporal Changes in TP	77	66 (88%)	9 (12%)	17-54	19.2
Context Influence on TP	38	35 (92.1%)	3 (7.9%)	17-26	18.9

## Chapter 2

### *Instruments*

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All psychological instruments used in this research project will be described in the present chapter. In the first moment, attention will be dedicated to the instruments created or adapted in the scope of this research (TFTPS, AISS and TEIC). Later, the focus will be on instruments created or adapted by others authors (e.g.: TPS, RSES, AHS and CFCS).

Thus the order of presentation of the instruments will be the following:

- Chapter 2.1: Sociodemographic questionnaire.
- Chapter 2.2: Zimbardo Time Perspective Inventory – ZTPI.
- Chapter 2.3: Transcendental Future Time Perspective Scale – TFTPS.
- Chapter 2.4: Arnett Inventory of Sensation Seeking – AISS.
- Chapter 2.5: Temporal Extension Inventory of Coimbra – TEIC.
- Chapter 2.6: Time Perspective Scale – TPS.
- Chapter 2.7: Rosenberg Self-Esteem Scale – RSES.
- Chapter 2.8: Adult Hope Scale – AHS.
- Chapter 2.9: Consideration of the Future Consequences Scale – CFCS.

## 2.1 Sociodemographic questionnaire

This questionnaire was created with the intent of collecting general information about several sociodemographic variables such as: gender, age, marital status, number of siblings, birthplace and nationality, amongst others. In a preliminary study participants had the opportunity to express their opinions about this questionnaire, allowing the researcher to effectively deal with any difficulties in item comprehension identified by the participants. Appendix A presents the definitive version of the questionnaire.

## 2.2 Zimbardo Time Perspective Inventory – ZTPI

The Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999) was created after three decades of research by Prof. P. Zimbardo and colleagues in order to overcome several gaps in the assessment of TP<sup>6</sup>. Since then, it has been translated into more than 30 languages from countries of all continents, which is an important asset since this worldwide use facilitates its use in cross-cultural studies. Currently the ZTPI is probably one of the most well-known

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<sup>6</sup> Zimbardo & Boyd (1999) stated that most TP assessment research efforts are disperse and not cumulative with previous findings.

psychological evaluation instruments among the scientific community and it is referred to as the most reliable and valid index of TP (Sword et al., in press) and “the leading measure of TP” (Boniwell et al., 2010, p. 25)

The Portuguese version of this inventory was developed by Ortuño & Gamboa (2009). These authors replicated the original 5-factor structure proposed by Zimbardo & Boyd (1999) with good psychometric characteristics.

The Portuguese ZTPI is composed of 56 items (with a 5-point Likert scale answer format)<sup>7</sup>, encompassing five temporal dimensions: 1) Past Positive, related with pleasant and warm attitudes towards the past (explained variance = 6.02%,  $\alpha = .68$ , 9 items) and formed by items such as: “*Familiar childhood sights, sound smells often brings back a flood of wonderful memories*”. 2) Past Negative, represents an aversive and distressful attitude towards the past (variance explained = 7.85%,  $\alpha = .80$ , 10 items), composed of items like “*Painful past experiences keep being replayed in my mind*”. 3) Present Hedonist, represents a tendency to seek immediate pleasure, through exciting and risky experiences (explained variance = 8.37%,  $\alpha = .79$ ; 15 items); an example of items included in this dimension is “*I try to live my life as fully as possible, one day at a time*”. 4) Present Fatalist, shows a global defeating attitude towards life (explained variance = 6.42%,  $\alpha = .66$ , 9 items); it is formed by items like “*Fate determines much in my life*” and 5) Future, which indicates a strong tendency to create and prosecute long term goals (variance explained = 6.57%,  $\alpha = .74$ , 13 items); it is

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<sup>7</sup> Similar to the original version (Zimbardo & Boyd, 1999).

composed of items like “*I believe that a person’s day should be planned ahead each morning*” (Ortuño & Gamboa, 2009). The Portuguese adaption of ZTPI can be looked up in Appendix B.

These five temporal dimensions explain 35.25% of the total variance and its factor structure is very similar to the one reported by Zimbardo and Boyd (1999) in the original ZTPI, as well as in several international adaptations (see Table 3 for a brief comparison). Concerning the test/re-test validity, the Portuguese ZTPI shows values between .66 and .86 (Ortuño & Gamboa, 2008).

*Table 3. ZTPI factor structure and internal consistency among several international versions*

Country	Total Var.	PP Var.	PN Var.	PH Var.	PF Var.	F Var.	PP $\alpha$	PN $\alpha$	PH $\alpha$	PF $\alpha$	F $\alpha$
U.S.A. <sup>a</sup>	36%	4.5% (4 <sup>th</sup> )	12.3% (1 <sup>st</sup> )	8.9% (2 <sup>nd</sup> )	3.9% (5 <sup>th</sup> )	6.3% (3 <sup>rd</sup> )	.80	.82	.79	.74	.77
Portugal <sup>b</sup>	35.25%	6.02% (5 <sup>th</sup> )	7.85% (2 <sup>nd</sup> )	8.37% (1 <sup>st</sup> )	6.42% (4 <sup>th</sup> )	6.57% (3 <sup>rd</sup> )	.68	.80	.79	.66	.74
Brazil <sup>c</sup>	33.38%	3.05% (5 <sup>th</sup> )	8.25% (1 <sup>st</sup> )	7.20% (2 <sup>nd</sup> )	5.87% (4 <sup>th</sup> )	6.62% (3 <sup>rd</sup> )	.69	.81	.79	.76	.75
France <sup>d</sup>	32.75%	4.4% (4 <sup>th</sup> )	8.05% (2 <sup>nd</sup> )	10.5% (1 <sup>st</sup> )	3.7% (5 <sup>th</sup> )	6.07% (3 <sup>rd</sup> )	.70	.72	.79	.70	.74
Greece <sup>e</sup>	33.2%	2.7% (5 <sup>th</sup> )	5.5% (3 <sup>rd</sup> )	11.7% (1 <sup>st</sup> )	5.0% (4 <sup>th</sup> )	8.3% (2 <sup>nd</sup> )	.73	.80	.85	.71	.83
Lithuania <sup>f</sup>	34.7%	3.3% (5 <sup>th</sup> )	7.71% (2 <sup>nd</sup> )	7.3% (3 <sup>rd</sup> )	4.4% (4 <sup>th</sup> )	11.99% (1 <sup>st</sup> )	.63	.79	.77	.73	.77
Russia <sup>g</sup>	33.41%	3.4% (5 <sup>th</sup> )	8.4% (2 <sup>nd</sup> )	9.2% (1 <sup>st</sup> )	4.9% (4 <sup>th</sup> )	7.5% (3 <sup>rd</sup> )	.68	.77	.79	.75	.75
Spain <sup>h</sup>	33.82%	4.36% (4 <sup>th</sup> )	11.22% (1 <sup>st</sup> )	7.74% (2 <sup>nd</sup> )	3.98% (5 <sup>th</sup> )	6.49% (3 <sup>rd</sup> )	.70	.80	.79	.64	.70

*Note.* The factor order is presented in parenthesis.

<sup>a</sup>Zimbardo & Boyd (1999). <sup>b</sup>Ortuño & Gamboa (2009). <sup>c</sup>Leite & Pasquali (2008). <sup>d</sup>Apostolidis & Fieulaine (2004). <sup>e</sup>Anagnostopoulos & Griva (2012). <sup>f</sup>Liniauskaite & Kairys (2009). <sup>g</sup>Sircova, Sokolova & Mitina (2008). <sup>h</sup>Diaz-Morales (2006).

Due its multidimensional nature the ZTPI has been used in a wide array of researches studying adaptive and functional concepts, such as: various types of pro-environmental behaviours (Corral-Verdugo et al., 2006; Milfont & Gouveia, 2006); academic achievement (Boniwell & Zimbardo, 2004); and self-esteem (Ortuño & Vásquez, 2013; Seema et al., 2010, July). But the ZTPI has also been successfully used in the study of negative behavioural dimensions - e.g. higher scores in dimensions like the Present Fatalistic, Past Negative and Present Hedonist are associated with behaviours like, for example, risky driving (Zimbardo, Keough & Boyd, 1997), smoking and alcohol consumption (Keough, Zimbardo & Boyd, 1999), cannabis consumption (Apostolidis et al., 2006), and procrastination (Ferrari & Diaz-Morales, 2007), among others, all of which can undermine a healthy developmental trajectory.

Currently a series of cross-cultural studies using the ZTPI are underway; the first one (Sircova et al., in press) aims to assess the structural equivalence of ZTPI across 24 countries, using a large sample of 12200 participants. The five factor structure was successfully replicated using both exploratory and confirmatory factor analysis techniques across 23 of the 24 participant countries (Portugal among them), with acceptable internal consistency in all dimensions. Also, the same authors decided to test the adequacy of a short version of the ZTPI, which is composed of 36 items. This short version didn't achieve the same levels of consistency of the 56-items ZTPI, reason why Sircova and colleagues

recommend its utilization only to carry out non-robust statistical techniques, such as mean comparisons between groups.

### **2.3 Transcendental Future Time Perspective Scale – TFTPS**

This instrument was created by Boyd & Zimbardo (1997) in order to assess individuals' attitudes and beliefs regarding the future immediately following the imagined death of the physical body or, as the authors name it, the Transcendental Future Time Perspective. It's a one-dimensional scale that comprises 10 items (using a 5-point Likert scale) such as: "*Only my physical body will ever die*" or "*I believe in spirits*". The TFTPS factor structure was tested through a Exploratory Factor Analysis together with the five original ZTPI dimensions. In this analysis it was found that the TFTPS explains 10% of the total variance and it is the factor that explains most variance (in a total of 6 temporal dimensions, including Transcendental Future). The TFTPS has an internal consistency of .87 and its test / re-test stability is .86. To date, efforts have been made to adapt this instrument to several countries, including: Germany, Estonia (Seema, et al. 2010, July) and Lithuania, but results are not yet available.



In the process of translation and adaptation of the TFTPS to the Portuguese language and culture, the recommendations of Widenfelt, Treffers, de Beurs, Siebelink e Koudijs (2005) for the translation and adaptation of psychological assessment instruments were taken into account. The translation of the TFTPS items was carried out by the author of this thesis and a bilingual psychologist (Portuguese and English); this translation was then submitted for analysis to an expert in the Portuguese language to determine the adequacy of the translation. In the following step, the translation was discussed in a panel composed of psychologists in order to determine the representativeness of the psychological construct in this version of the scale. Subsequently, in order to assess the correspondence between the new Portuguese version and the original version of the TFTPS, an University English teacher was asked to carry out a back translation of the scale, which was compared by the authors to the original TFTPS. The Portuguese TFTPS items can be found in Appendix C.

A preliminary study was also conducted with a small group of Psychology students where they were supposed to deliver their (initial) appraisal of the TFTPS. They were asked to respond to the TFTPS while also filling an answer grid. On this grid the participants had to choose between several positive and negative options concerning the structure of the items (e.g. grammatically structured, ambiguous, etc.), and, additionally, provide feedback they considered to be relevant. In short, most participants described the TFTPS as being easy to answer, easy to understand and grammatically well-structured. Only a very few

participants considered the TFTPS as a tiresome, ambiguous or difficult questionnaire to understand. No changes to the scale were recommended by the participants.

## 2.4 Arnett Inventory of Sensation Seeking – AISS

Sensation Seeking is now a classic concept that was introduced by M. Zuckerman in the early 1960s, defined as “the need for varied, novel, and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experiences” (Zuckerman, 1979, p. 10). As mentioned by several authors (Arnett, 1994, Haynes, Miles & Clements, 2000; Roth et al., 2005) most research carried out on this topic has used different versions of the Zuckerman, Eysenck & Eysenck (1979) Sensation Seeking Scale – SSS; which in the process of construction has undergone several stages of development (Haynes et al., 2000). The most used form is the SSS form V, which is formed by 40 items of forced-choice format, grouped in four subscales: Thrill and Adventure Seeking, Experience Seeking, Disinhibition, and Boredom Susceptibility (Zuckerman et al., 1978). The latest development of SSS is form VI, and was primarily designed with the purpose of measuring the differences between actual sensation-seeking behaviour and the intention or desire to

experience sensation-seeking activities, yet this form has not been widely employed by researchers (Zuckerman, 2008).

The SSS is not exempt from criticism; Arnett (1994; 1996) argues that SSS presents several limitations that can undermine the assumptions made from its results. Some of the issues mentioned by this author are related to the content of SSS items: referring to intense physical activities<sup>8</sup>, dated words or expressions (such as: hippies, jet set, queer), drugs and sex related items. But also with its dichotomical forced-choice response format. In fact, Arnett (1994) refers that this response format can be frustrating and confuse, since participants tend to not fully agree with either of the response options. Forced-choice format has been also referred to mostly assess intraindividual differences regarding the studied concepts, instead of inter-individual differences (Clark & Watson, 1995).

Considering those limitations, Arnett (1994) created the Arnett Inventory of Sensation Seeking – AISS, with the intent of overcoming some of those issues and to present a measure of Sensation Seeking more suited to present-day individuals. The AISS is formed by 20 items with four response options (1 = describes me very well, 2 = describes me somewhat, 3 = does not describe me very well, 4 = does not describe me at all), grouped into two psychological dimensions: Novelty and Intensity, each comprising 10 items. The first dimension,

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<sup>8</sup> Arnett (1994) argues that items referring to intense physical activities can bias the real scores of older participants' Sensation Seeking, due their physical limitations. In other words, the fact that an old participant can't engage in physical activities doesn't necessarily represent lower values in that individual's Sensation Seeking.

Novelty, refers to the need for new sensations and is composed of items such as: *“When taking a trip, I think it is best to make as few plans as possible and just take it as it comes”* and *“I think it’s fun and exciting to perform or speak before a group”*. The second dimension, Intensity, refers to the individual’s need to experience intense sensations and experiences, which integrates items like: *“When I listen to music, I like it to be loud”* and *“I like a movie where there are a lot of explosions and car chases”*. Arnett (1994) considers that Sensation Seeking is characterized by the need to seek experiences associated with these two dimensions in the multiple contexts where the individuals live.

The AISS has proved to be a valid and useful measure of Sensation Seeking due its substantial associations with SSS, but also with several types of risk or dysfunctional behaviour like reckless driving, unsafe sex, drug consumption, vandalism, theft (Arnett, 1994; 1996), alcohol consumption (Andrew & Cronin, 1997; Smorti & Guarnieri, 2013), marihuana use (Watten, 1997) and pathological gambling (Nower, Derevensky & Gupta, 2004; Powell, Haroon, Derevensky & Gupta, 1999). Besides, it is also related with dysfunctional personality traits like psychoticism (Desrichard, Vos, Bouvard, Dantzer & Paignon, 2008). AISS also shows a positive association with positive personality traits likes openness to experience, agreeableness (Roth & Herzberg, 2004) and extraversion (Desrichard, et al., 2008; Roth & Herzberg, 2004). Due its items’ formulation and content, AISS scores are not affected by social desirability (Roth, 2003). Regarding gender differences, several studies have referred the

same pattern of differences, with male scores higher than female in the total AISS score (Arnett, 1994; Desrichard et al., 2008; Lourey & McLachlan, 2003; Nower et al., 2004; Roth & Herzberg, 2004; Roth et al., 2005). Still, only Arnett (1994) proposed an explanation for this tendency; according to this author the differences in Sensation Seeking amongst genders are due the variances in early socialization, yet this is a subject that needs empirical verification. Another explanation for these gender differences is proposed by Zuckerman et al. (1978), who defends that differences in individuals' biological functioning is the basis for gender differences in Sensation Seeking.

However, the AISS creation process focused only on its content validity (Desrichard et al., 2004; Haynes et al., 2000), lacking both exploratory and confirmatory factor structure analysis. This type of analysis has been provided by other researchers when using AISS international versions. Using a German sample, Roth & Herzberg (2004) achieved good fit indices with a two-factor structure (composed of 12 items); Desrichard et al. (2008) used, in a French sample, a scale comprising 17 items grouped into two components, while they still recommend the use of a single-component structure; a choice that was motivated mostly by the low internal reliability of the intensity and novelty subscales. Haynes et al. (2000), using the original items in a sample from the United Kingdom, were forced to reduce the scale to 12 items in order to achieve a statistically satisfactory model. Nevertheless, Carretero-Dios & Salinas (2008),

using the Spanish AISS version, which comprises 20 items, were able to obtain a two-factor structure. All these researches were carried out using CFA.

Regarding AISS internal consistency, the results are analogous among the several researches above mentioned<sup>9</sup>, the Total inventory presents a Cronbach's Alpha value of around .60 and .70. The Novelty subscale shows values between .50 and .57 and in the Intensity subscale, values ranged between .57 and .64 (see Table 15 for a brief comparison among versions). Considering several recommendations for Cronbach's Alpha analysis (Almeida & Freire, 2003; Kline, 2000; Pestana & Gageiro, 2008), both the AISS subscales present mostly inadmissible values (lower than .6); yet, if we consider the total inventory, the values are slightly better, falling into the weak/minimally acceptable category (between .6 and .7).

All the criticisms concerning the SSS were at the base of the decision of choosing the AISS instead of the SSS as instrument to measure the sensation-seeking trait. Still, two more reasons were involved in that decision: a) the number of items in the AISS is much smaller than SSS and there is a crucial difference regarding SS conceptualization; b) for Zuckerman (2008) the SS trait is mostly determined by biological forces, as opposed to Arnett (1994) who defends that the social environment is at least as important as the biological component.

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<sup>9</sup> With the exception of Haynes et al.'s (2000) research, which did not report any information regarding this matter.

The entire process of translation and adaptation of the original AISS to the Portuguese language and culture was carried out following Widenfelt et al.'s (2005) recommendations for translation and adaptation of psychological assessment instruments. Regarding the translation, the steps concerning translation and back-translation were respected (Hambleton & Patsula, 1994). The translation of the AISS items was carried out by the author of this thesis and a bilingual psychologist (Portuguese and English). Then, the translation was submitted for analysis by an expert in Portuguese to determine the adequacy of the translation to the Portuguese language and culture. Following these steps the translation was discussed by an expert panel in order to determine the representativeness of the psychological construct in this version of the scale. Subsequently, the analysis of the correspondence between the Portuguese version and the original version of the scale was performed by an University English teacher who was asked to carry out the scale's retroversion, which was approved by AISS author J. Arnett (in order to consult the Portuguese AISS items, please go to Appendix D).

Finally, we conducted a pilot study in which the participants ( $n = 199$ ) were asked to fill in the AISS along with an answer grid. On this grid the participants were asked to give their impressions about the AISS, choosing between several positive and negative options (e.g. grammatically structured, ambiguous, etc.), and provide any kind of feedback they found relevant. In short, most participants described the AISS as being easy to answer, easy to

comprehend and grammatically well structured. Just a few participants (less than 5%) considered the AISS as a tiresome, ambiguous or difficult to understand questionnaire.

## **2.5 Temporal Extension Inventory of Coimbra – TEIC**

After an analysis of the Temporal Extension literature, we concluded that there was a need for a current instrument capable of measuring temporal extension in a fast and reliable way. The Temporal Extension Inventory of Coimbra – TEIC is a proposal to overcome the current lack of such an instrument. The TEIC items were designed to avoid any social desirability bias by using items that do not describe behaviours or attitudes that can be seen either as desirable or, on the contrary, to be avoided, by respondents. It comes as the evolution of the 8-item TEIC firstly presented by Ortuño, Paixão & Janeiro (2011c). It is composed of 14 items (using a 7 point Guttman response scale). The response options are: 2 months, 6 months, 1 year, 3 years, 5 years, 10 years and 20 years or more. All items are composed of statements concerning three life contexts (life in general, work and relational) located in the psychological past or future. Therefore, it includes two sub-scales:



- Future Temporal Extension: Related to how far in the future the individuals' look is projected; it is formed by six items (nos. 1, 2, 3, 5, 6, and 7).
- Past Temporal Extension: Refers to how far in the past the individuals' motivational objects are located; it is formed by six items (nos. 8, 9, 10, 12, 13 and 14).

Items 4 (Future) and 11 (Past) are control items and their aim is to detect if participants are devoting their attention to the proposed task. These two items produce a score which is calculated taking into account the participants' age. All TEIC items were developed without any affective valence, in order to avoid possible biases concerning positive or negative events existing in the individuals' psychological past or/and future.

The construction of the TEIC followed a process which included several steps: The first step was to analyse the existent literature regarding the concept and measurement instruments of Temporal Extension. Then, the process was continued with the writing of a set of items which intended to assess Temporal Extension (about 30), from which eight were selected to constitute the first sketch of the inventory. With this first experimental version data was collected from 50 participants and the results were promising since the two-factor structure proposed was confirmed (high factor loadings and communalities in almost all the items; those results are presented in Ortuño, Paixão & Janeiro

(2011c). Taking these results into account some items were reviewed and six more items were added in order to improve several TEIC psychometrical indicators. The final TEIC, composed of 14 items, had already been used in other studies and several participants had been surveyed about its characteristics (in response to a questionnaire), stating that they considered it easy to answer and with a good grammatical structure. Also, the content of the TEIC items were analysed and approved by an expert in Portuguese language and culture and, finally all TEIC items were analysed by a psychologist panel. The whole inventory can be seen in the Appendix E.

## 2.6 Time Perspective Scale – TPS

Presented as the *Inventário de Perspectiva Temporal – IPT* (Janeiro, 2006; 2012), this inventory was created in Portugal and its aim is to allow a global assessment of TP. It is especially designed for primary and secondary students, as the author argues that most of the TP instruments are oriented towards adult groups. TPS was inspired by some of the Long-Term Personal Direction Scale – LTPD (Marko & Savickas, 1998) items, a scale designed to measure not only temporal orientation but also several of its components (such as density, extension, optimism and others). Nevertheless, since LTPD is only focused on the

Future frame of Time Perspective, more items were added in order to also assess the Past and Present temporal frames.

TPS comprises 32 items (7-point Likert Scale) that assess four Temporal Orientations: Past Orientation, which is formed by items such as *“I often think of my past”* and *“I like to remember when I was a child”* (7% explained variance,  $\alpha = .51$ , 4 items); Present Orientation, composed of items such as *“I think life should be lived one day at a time”* and *“Usually I make my decisions on the hour”* (13% explained variance,  $\alpha = .76$ , 8 items); Future Orientation, with items like *“I have lots of projects for my future”* and *“I feel enthusiastic about my future”* (16% explained variance,  $\alpha = .86$ , 16 items); and, finally, Future Negative (or Anxious Future) Orientation, formed by items like *“I go into the future by chance not by option”* and *“I think life has no pattern or sense”* (8% explained variance,  $\alpha = .70$ , 4 items) (Janeiro, 2012). Most items presented a high factor loading above .50 in the respective factor. Regarding internal consistency, one dimension presented a poor result (Past Orientation), two can be considered as good (Present and Future Negative Orientations) and one was very good (Future Orientation).

The TPS has demonstrated its conceptual validity and can be considered as a valid instrument to measure Time Perspective, due its structural congruence with the Zimbardo Time Perspective Inventory – ZTPI (Ortuño & Janeiro, 2009), and both instruments can complement each other: on one side the TPS presents a negative future subscale which the ZTPI doesn't, but on the other side the ZTPI

presents a deeper evaluation of Past and Present Time Perspectives, due its subscales of Positive and Negative Past, and Hedonist and Fatalist Present. This idea was successfully tested by Ortuño & Janeiro (2010), who found similar results for TP in individuals of different ages groups.

This inventory has proven its utility in several studies so far. Janeiro (2008; 2010) found important associations between Future Time Perspective and career planning, general and specific self-esteem, internal success beliefs and vocational behaviour dimensions. Nobre & Janeiro (2010) demonstrated an important and positive association between Future Time Perspective and several measures of school adjustment (a positive attitude towards school, academic well-being, general school adjustment, amongst others), whilst Negative Future Time Perspective presented also an expressive, but this time negative association, with the same constructs. The Future Negative sub-scale has been successfully used in other studies, for example in the prediction of individuals' Self-Esteem (Ortuño et al., 2013a; Ortuño & Vásquez, 2013), as well its differences across different age groups (Ortuño, Paixão & Janeiro, 2011a). The TPS was also used in an educational program with the intent of enhancing not only the individuals' TP, but also their career maturity. At the end of the program the subjects improved in the areas that it tapped, although the results were not statistically significant (Neto, 2000); still, we believe that this result is due to the small sample size, and cannot be attributed either to the instruments or to the program's conception. Another important contribution of studies using the TPS is reported by Gomes

(2012), whom successfully associated Time Perspective with individual's learning approaches/strategies, and through the presented results it is possible to conclude that Time Perspective is related at several levels to the learning approaches/strategies since Future Time Perspective presented a positive and significant relation with both Intrinsic and Realization Motivations, while Future Negative Time Perspective was negatively associated with those type of motivations and positively with Instrumental Motivation.

## **2.7 Rosenberg Self-Esteem Scale – RSES<sup>10</sup>**

The concept of Self-Esteem has greatly attracted the attention of psychologists for a long time; it is considered as one of the most extensively studied constructs in Psychology (Marsh, Scalas & Nagengast, 2010). It was defined as the positive or negative attitude towards the self, including the feelings of self-acceptance, self-respect and worth for one's own self (Rosenberg, 1986). Self-Esteem represents the individual's set of their own worthiness, in other words, the evaluative part of self-concept (Heatherton & Wyland, 2003). Self-Esteem is a very popular construct in psychological research because of its predictive power. Consistently, Self-Esteem has been related with several

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<sup>10</sup> Portions of this section's contents were previously published in Ortuño & Vásquez (2013).

personality variables such as extraversion, neuroticism and negative and positive affectivity (Watson, Suls & Haig, 2002), and mental health phenomena such as depression (Fleming & Courtney, 1984; Neiss, Stevenson, Legrand, Iacono & Sedikides, 2009), happiness, life satisfaction and well-being among different socio-cultural conditions (Diener & Diener, 1995; Gray-Little & Hafdahl, 2000), eating disorders (Peck, 2008), self-concept (Santos & Maia, 2003) and career trajectories (Salmela-Aro, & Nurmi, 2007). For this reason, Self-Esteem has been a frequently targeted process in psychological interventions.

Self-Esteem was assessed with the Self-Esteem Scale (Rosenberg, 1965), composed of 10 items and adapted into Portuguese by Santos & Maia (1999, 2003). The Rosenberg Self-Esteem scale evaluates global Self-Esteem. Participants gave their responses about how they generally feel about themselves on a 4-point Likert scale (1= strongly disagree; 4= strongly agree). Half of the items are formulated in a positive direction and the other half in a negative direction, which is reverse scored. The range of the scale is 10-40, with higher scores reflecting higher global Self-Esteem. Santos & Maia (1999, 2003) reported with exploratory and confirmatory factor analyses the existence of only one underlying dimension for the 10 items with an internal consistency of .84. In a previous study using samples from 53 countries, Schmitt & Allik (2005) reported acceptable values of internal reliability in almost all countries (the mean value of the Cronbach's Alpha was .81).

## 2.8 Adult Hope Scale – AHS

The operationalization of the concept of Hope according to Snyder et al. (2002) comprehends its assessment through the Adult Hope Scale – AHS, which is a two dimensions inventory composed of 14 items using a 4-point Likert response format (1 = definitely false, 2 = mostly false, 3 = mostly true, 4 = definitely true). Eight items are related with dispositional Hope (four are designed to measure Agency thinking and four with 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 also reported in previous studies (Pais-Ribeiro, Pedro & Marques, 2006; Phan, 2013; Rand, 2009; Tong, Fredrickson, Chang & Lim, 2010). The temporal stability is also acceptable, since the AHS presented a test-retest correlation of .85 ( $p < .001$ ) after a 3-week interval (Snyder et al., 1991).

The Agency dimension is formed by items such as “I've been pretty successful in life” and “I energetically pursue my goals”. A couple of sample items from the Pathways dimension are “I can think of many ways to get out of a jam” and “There are lots of ways around a problem”.

Results obtained using the AHS also 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), global life satisfaction (Marques, Pais-Ribeiro & Lopez, 2009) and cross-situational expectancies for achieving goals ( $r = .54, p < .005$ ; Holleran & Snyder, 1990). 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 centred in the Hope concept have established its pertinence concerning adaptive cognitions, such as life satisfaction and self-worth (Marques, Lopez & Pais-Ribeiro, 2011).

The Portuguese AHS adaptation was prepared by Pais-Ribeiro et al. (2006) following Snyder's (2002) recommendation for an eight-point Likert scale. Regarding the internal consistency, the Portuguese AHS presented Cronbach's alpha values of .76 for Agency, .79 for Pathways and .86 in the total score. Through an EFA the authors replicated the two-factor structure proposed by Snyder and colleagues, but when they carried out a CFA the one-factor model appeared to be a better solution, (see Table 4 for a comparison between the adjustment indices of these two models).



Table 4. Portuguese AHS Model Adjustment Indices

	$\chi^2$	<i>df</i>	CFI	RMSEA
One-Factor Solution	69.86	20	.91	.11
Two-Factor Solution	181.58	20	.70	.21

Note. According to the information presented by Pais-Ribeiro et al. (2006)

The matrix of this inventory has been modified in order to meet the needs of Hope assessment in other populations and also in specific domains (Snyder et al., 2003). Some examples are the Children's Hope Scale (Snyder et al., 1997), the Adult State Hope Scale (Snyder et al., 1996) and a few more proposals from Simpson (1999) and McDermott, Hastings, Garigietti & Callahan (1997), which are domain-specific measures.

## 2.9 Consideration of the Future Consequences Scale – CFCS

The Consideration of Future Consequences Scale – CFCS is a measure of the extent to which individuals reflect and are influenced by the immediate as well as by the distant outcomes of current behaviour (Strathman et al., 1994). It is composed of 12 items (5-point Likert scale), grouped into two subscales (future and immediate). In its Portuguese adaptation it presents a good internal

consistency (.86) and a clear one-dimensional factor structure (Vasquez, Esteves, Gomes & Ortuño, in press).

The psychometric properties were very good, with internal reliabilities typically ranging from .80 to .86, and test-retest correlations of .76 (two weeks) and .72 (five weeks) (all data relating to the complete, 12-item scale). In the original article, Strathman et al. (1994) reported exploratory and confirmatory factor analyses supporting the idea of a single underlying factor. However, more recent research suggests that the scale is comprised of two factors (Petrocelli, 2003; Joireman, Balliet, Sprott, Spangenberg, Schultz, 2008). For instance, Joireman et al. (2008) explored the validity of the two-factor solution. They found that the two sub-factors differentially predict the trait self-control, ego depletion and temporal discounting, with the CFC-I scale being the best and unique predictor.

Concerning the discriminant validity of the English version of the CFC, Joireman, Strathman & Balliet (2006) have shown the validity of the CFC across four domains (a) *Health Behaviour, Risk-Taking, and Academic Achievement*; (b) *Aggression* (c) *Prosocial Organizational Behaviour* and (d) *Pro-environmental Attitudes and Behaviour*. Firstly, it was demonstrated that individuals who scored high on the CFC scale reported greater general concern with health, exercising more frequently and with a lower use of drugs (Ouellette, Hessling, Gibbons, Reis-Bergan, & Gerrard, 2005). Also, they are less likely to engage in risky sexual

practices and more likely to get an HIV test (Dorr, Krueckeberg, Strathman, & Wood, 1999). Secondly, it was consistently shown that CFC relates to aggression. The consideration of future consequences 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 behaviour. Thirdly, some aspects of organizational behaviour were also predicted by the CFC. Research has shown that CFC is related to willingness to engage in prosocial organizational behaviour and knowledge sharing in organizations (Joireman, Daniels, George-Falvy, & Kamdar, 2006; Joireman, Kamdar, Daniels, & Duell, 2006). 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), tend to defend and be concerned about the environment (Joireman, Lasane, Bennett, Richards, & Solaimani, 2001), and have stronger preferences for public transportation and for structural solutions for transportation dilemmas (Joireman, Van Lange, & Van Vugt, 2004; Joireman, 2005).

## Chapter 3

### *Procedures and Statistical Analyses*

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In this chapter the procedures developed in the ambit of the several studies will be presented, and also the statistical techniques applied. Each sub-chapter will represent one of the studies. Still, we would like first to refer some procedural informations that are transversal to all the studies developed and only then we would refer specific information of each study.

The paper and pencil data collections were all carried out in Portuguese universities (Coimbra, Lisboa and Porto). All instruments were used collectively during the beginning or the ending of a class. Authorization to collect the data among the students was previously asked to the course teachers.

Before students began answering the questionnaires, a brief explanation was made about the objectives of the study as well as the terms of their participation. Students were informed that their participation was totally voluntary and anonymous. All collected data was introduced in the statistical software IBM SPSS Statistics Version 20.

In four studies (see topics 3.5, 3.6, 3.8 and 3.9) some of the participants ( $n = 8$ ) responded to the questionnaires individually through a computer using a digital platform created with the intent of collecting data via internet.

### **3.1 ZTPI Confirmatory Factor Analysis**

All data was collected in the Faculty of Psychology and Educational Sciences of the University of Coimbra, Portugal. The data was collected during November of 2010 and January of 2012.

Among the 56 items of the ZTPI, 48 presented missing values, yet in no item were more than 7 missing values found (representing .9% of the total responses per item). In order to successfully carry out the CFA, it was decided to perform Little's Missing Completely At Random Test and subsequently the Expectation-Maximisation – EM algorithm. More specific information about the MCAR Test can be found in Table 5.

Table 5. Little's MCAR Test on ZTPI Subscales

<i>Sub-scale</i>	$\chi^2$	<i>df</i>	<i>p</i>
Past Positive	87.72	47	.00
Past Negative	96.14	93	.39
Present Hedonist	191.72	160	.04
Present Fatalist	67.61	57	.16
Future	75.22	79	.60

Since the MCAR value was non-significant ( $p > .05$ ) in the Past Negative, Present Fatalist and Future subscales, the Expectation-Maximisation – EM technique was employed in order to substitute the missing values. In the remaining two dimensions, Past Positive and Present Hedonist, the participants presenting any missing value in those dimensions were eliminated from the database, since it was not advisable to use EM because the MCAR test was significant ( $p < .05$ ). After these refinements the final sample was composed by 795 participants.

### 3.2 TFTPS Exploratory & Confirmatory Factor Analysis

All data was collected in the Faculty of Psychology and Educational Sciences of the University of Coimbra, Portugal. The data was collected during November and December of 2010. In order to explore the factor structure of the TFTPS, an Exploratory Factor Analysis was developed using Principal Component Analysis, the rotation method was Varimax Rotation and the missing values were treated with the Listwise method. Then, the TFTPS was analyzed with a Confirmatory Factor Analysis using Structural Equation Modeling with maximum likelihood estimation.

### **3.3 AISS Exploratory & Confirmatory Factor Analysis**

All data was collected in the Faculties of Psychology and Educational Sciences of the University of Coimbra and the University of Porto, Portugal. The data was collected during October and December of 2012.

Multiple imputations using the Expectation-Maximisation – EM algorithm were used to replace isolated missing values in the data set (representing up to 1.2% of the total responses for each item). This procedure is adequate for the present sample since Little's MCAR Test was not significant ( $p = .51$ ).

### 3.4 TEIC Exploratory & Confirmatory Factor Analysis

All data was collected in the Faculties of Psychology and Educational Sciences of the University of Coimbra and the University of Porto, as well the Faculty of Psychology of the University of Lisbon, all three Faculties from Portugal. The data was collected during October and November of 2012.

Multiple imputations using the Expectation-Maximisation – EM algorithm were used to replace isolated missing values in the data set (representing up to 1.7% of the total responses for each item). This procedure is adequate for the present sample since Little's MCAR Test was not significant both in the Future Extension ( $p = .106$ ) and Past Extension subscales ( $p = .573$ ), indicating that the missing values were completely random.

### 3.5 A New Multidimensional Model of Time Perspective

In order to deal with the missing values, the Little's MCAR test was used in order to ascertain the adequacy of multiple imputations using the Expectation Maximisation – EM algorithm for the present dataset; five out of seven temporal



dimensions presented non-significant results ( $p > .05$ ) in this test. Those were Past Negative, Present Hedonist, Present Fatalist, Future and Future Negative. Therefore the EM algorithm was used to replace isolated missing values in those five dimensions. For the remaining two dimensions (Past Positive and Transcendental Future) which presented a significant result ( $p < .05$ ) in the MCAR test, the participants with missing values in those dimensions were eliminated from the dataset ( $n = 4$ ). In all cases, the number of missing values per item was never higher than 3 (representing less than 1.4% of missing values). In order to test the intended 7-dimension factorial model and the conceptual relations between the latent dimensions, Path Analysis and Confirmatory Factor Analysis through Structural Equation Modelling – SEM was employed; before this an Exploratory Factor Analysis – EFA was performed in order to discover the amount of variance explained by the model.

### **3.6 The Relation Between Time Perspective and Temporal Extension**

Regarding the sample missing values, Little's MCAR test was used in order to ascertain the adequacy of multiple imputations using the Expectation Maximisation – EM algorithm for the present dataset; both Future and Past Temporal Extension dimensions presented a non-significant result in the MCAR

test ( $p > .05$ ). Therefore the EM algorithm was used to replace isolated missing values in those two dimensions. In all cases, the number of missing values per item was never higher than 6 (representing less than 3.3% of missing values). In order to test the nature of the relation between the 7-dimension Time Perspective model and Temporal Extension, several models using Structural Equation Modelling – SEM were tested.

### **3.7 The Relation Between Time Perspective and Hope**

29 participants were removed from the database since they presented one or more missing values in some of the AHS items. The participants' responses were previously tested with Little's MCAR test in order to ascertain the adequacy of multiple imputations using the Expectation Maximisation – EM algorithm for the present dataset; both Agency and Pathways dimensions presented a statistically significant result in the MCAR test ( $p < .05$ ). Therefore the EM algorithm was not adequate to replace missing values in those two dimensions. In all cases, the number of missing values per item was never higher than 2 (representing less than 0.8% of missing values). In order to test the nature of the relation between the 7-dimension Time Perspective model and Hope, several models using Structural Equation Modelling – SEM were tested.

### **3.8 The Relation Between Time Perspective and Consideration of the Future Consequences**

In order to deal with the missing values, was used Little's MCAR test was used in order to ascertain the adequacy of multiple imputations using the Expectation Maximisation – EM algorithm for the present dataset; both CFCS Future and Immediate dimensions presented a non-significant result in the MCAR test ( $p > .05$ ). Therefore the EM algorithm was used to replace isolated missing values in those two dimensions. In all cases, the number of missing values per item was never higher than 9 (representing less than 4.2% of missing values). In order to test the nature of the relation between the 7-dimension Time Perspective model and these two dimensions of the Consideration of Future Consequences several models using Structural Equation Modelling – SEM were tested.

### **3.9 The Relation Between Time Perspective and Sensation Seeking**

In order to deal with the missing values, Little's MCAR test was used in order to ascertain the adequacy of multiple imputations using the Expectation Maximisation – EM algorithm for the present dataset; the Sensation Seeking

dimension presented a non-significant result in the MCAR test ( $p > .05$ ). Therefore the EM algorithm was used to replace isolated missing values in those two dimensions. In all cases, the number of missing values per item was never higher than 5 (representing less than 2.3% of missing values). In order to test the nature of the relation between the 7-dimension Time Perspective model and Sensation Seeking, several models using Structural Equation Modelling – SEM were tested.

### **3.10 The Relation Between Time Perspective and Self-Esteem**

Multiple imputations using the Expectation-Maximization – EM algorithm were used to replace isolated missing values in the data set (representing less than 1.5% of the responses for each item). In order to assess the direction and intensity of the associations between the variables a correlational analysis (Pearson Coefficient) was performed. Then, a structural equation modeling was developed with the objective of evaluating the effects of Time Perspective on Self-Esteem.

Two initial proposed hypothetical models were tested. Model 1 is formed by all 7 temporal dimensions originally used in this study (Past Positive, Past

Negative, Present Hedonist, Present Fatalist, Future, Future Negative, and Transcendental-Future) as exogenous variables and Self-Esteem as an endogenous variable. In Model 2, the exogenous variables are Past Positive, Past Negative, Present Fatalist, and Future Negative and again Self-Esteem as an endogenous variable. This last model was previously defined taking into account the main results present in the literature about the relation between Time Perspective and Self-Esteem.

### **3.11 Temporal Changes in Time Perspective**

All participants responded to the questionnaires twice, the temporal interval between the two data collections was of 11 months. No missing values analysis or transformation was performed due the extremely low occurrence of missing values, 15 variables presented one missing value and one variable presented two missing values.

A repeated-measures analysis with two levels (representing the two data collections) was carried out with the intent of uncovering possible differences in the participants' Time Perspectives across the time interval of the two data collections.

### 3.12 Context Influence on Time Perspective

All the participants responded to the questionnaires twice, the first wave of data collection was in a classroom setting after a class. The second wave of data collection was carried out via a digital questionnaire, and in this second moment the participants were all in their homes<sup>11</sup>. The mean time between responses was of four and a half months (Min = 3.9, Max = 6.7). No missing values analysis or transformation was made due to the lack of missing values.

A repeated-measures analysis with two levels (representing the two data collections) was carried out with the intent of discovering possible differences in participants' Time Perspectives across the time interval of the two data collections.

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<sup>11</sup> Participants location at the moment of their second participation in the study was confirmed by a question in the sociodemographic questionnaire, through which the participants were asked about their current location.

# Part III

## *Results & Discussion*

*"Facts are stubborn things,  
but statistics are more pliable."*

*Mark Twain*

## Chapter 1

### *Preliminary and preparatory statistical analyses*

---

To Werner Heisenberg (2000, p. 26) “...*what we observe is not nature in itself but nature exposed to our method of questioning.*” for this reason, in order to achieve the closest possible approximation to the true nature of mental and behavioural processes, psychologists and researchers must employ the highest standards of rigor and precision as much in the conception and utilization of the instruments of psychological assessment. No less important to reflect, the Portuguese context regarding research in psychological assessment is scarce; as Gonçalves, Simões, Almeida & Machado (2003) referred there’s an absence of instruments properly adapted to the Portuguese population and its specific subgroups. This entire chapter constitutes an effort to achieve a higher rigor in the psychological assessment, more specifically, regarding the topic of Time Perspective and other related concepts.

The aim of this chapter is to present several preliminary statistical analyses regarding the linguistic and cultural adaptation of several instruments. In the following sub-chapters will be addressed the Confirmatory Factor Analysis of Zimbardo Time Perspective Inventory – ZTPI (see sub-chapter 1.1), the



Exploratory and Confirmatory Factor Analyses of Transcendental Future Time Perspective Scale – TFTPS (see sub-chapter 1.2), Arnett Inventory of Sensation Seeking – AISS (see sub-chapter 1.3) and Temporal Extension Inventory of Coimbra – TEIC (see sub-chapter 1.4).

## **1.1 ZTPI Confirmatory Factor Analysis**

As mentioned earlier, the ZTPI has been already adapted to the Portuguese culture by Ortuño & Gamboa (2009), discovering a similar five factor structure as the presented by Zimbardo & Boyd (1999). Yet, no effort has been made to verify this factor structure in a Portuguese sample with more robust statistical techniques. Considering this, was decided to perform a Confirmatory Factor Analysis with data collected from a Portuguese sample and using the previously mentioned Portuguese ZTPI.

### ***1.1.1 Results***

CFA Assumptions: The normality of distributions assumption was tested prior to the Confirmatory Factor Analysis – CFA. The values of Asymmetry and Kurtosis did not indicate any violations to the principle of the univariate

normality since  $sk < 3$  and  $ku < 10$  (Marôco, 2010). Yet, the multivariate normality was not reached ( $ku > 10$ ).

The first step is to test the complete 56 items Portuguese ZTPI, without adding any parameter modification to the model. Most of the general model fit indices were simply unacceptable (CFI = .62; GFI = .77; NFI = .55); more information can be found in the row Model 1 of Table 6). This path diagram can be consult entirely in the Figure 3.

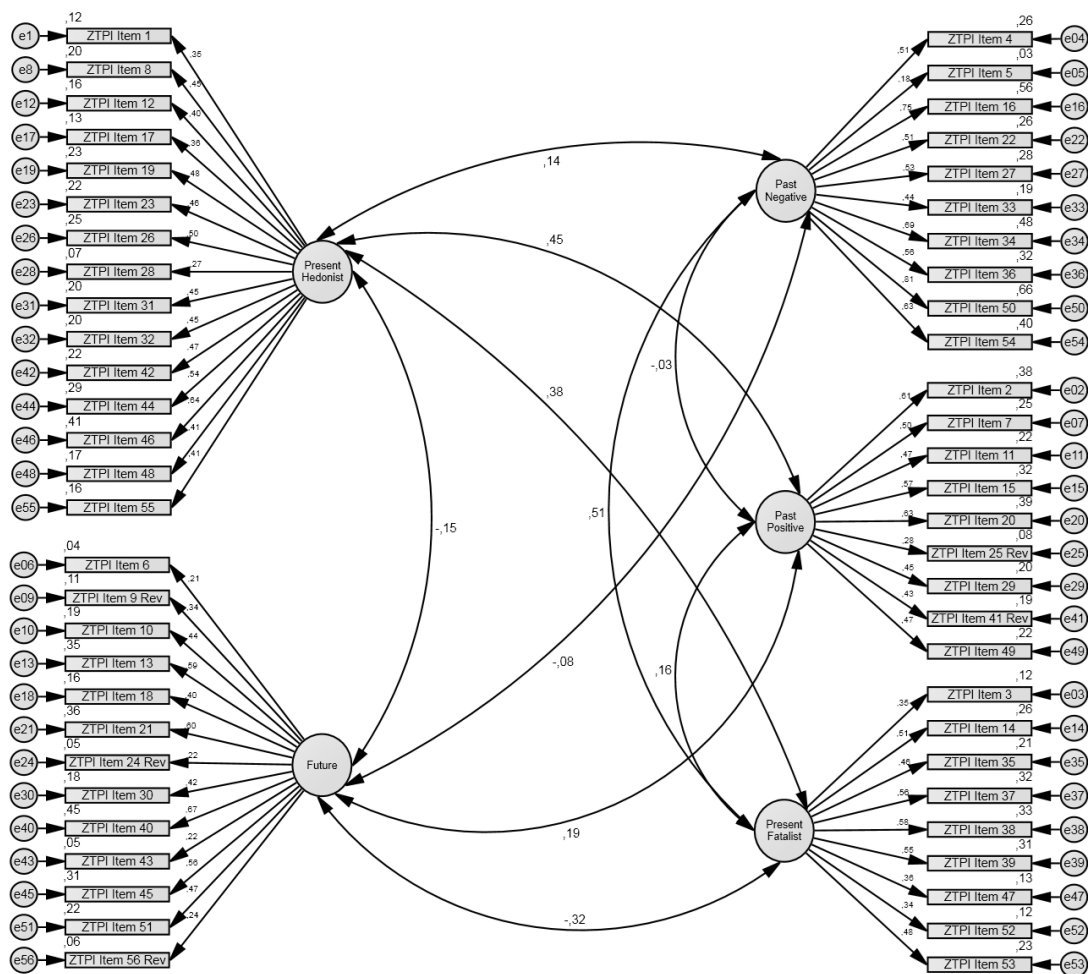


Figure 3. ZTPI Confirmatory Factor Analysis Path Diagram (Model 1)

Being so, were analyzed the modification indices in order to associate the residual error of several observable variables. This process was made in a step-by-step approach, checking all the fit indices after any new modification. Were fixed all the paths with a modification index higher than 11, following the recommendations of Marôco (2010). 12 paths between residual errors were correlated (Item 42 – Item 31; Item 15 – Item 41; Item 6 – Item 24; Item 6 – Item 43; Item 27 – Item 4; Item 21 – Item 40; Item 29 – Item 49, Item 52 – Item 53; Item 4 – Item 54; Item 35 – Item 38; Item 7 – Item 15 and Item 2 – Item 29), as can be confirmed in the Figure 4. This new model slightly outperforms the previous model in all the fit indices analyzed (CFI = .69; GFI = .80; NFI = .61). Still, these results are far from the minimal accepted for a trustful CFA (Marôco, 2010). More information about the fit indices of this model (Model 2) can be found in Table 6.

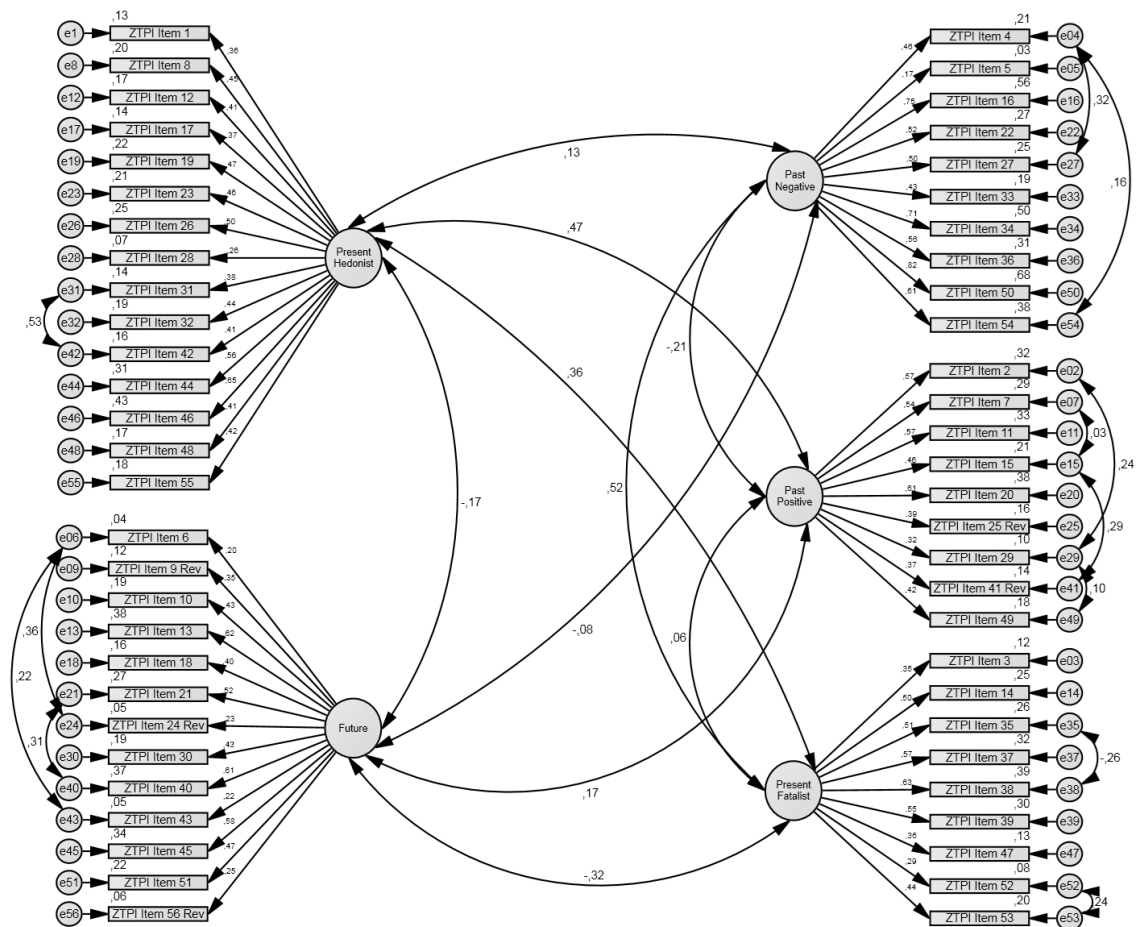


Figure 4. ZTPI Confirmatory Factor Analysis Path Diagram (with several residuals correlated, Model 2)

Having these results in mind, it was decided to push further in the effort to achieve acceptable fit indices with the ZTPI, as so we consider that the next step consists in the elimination of items with low factor loadings ( $\lambda = .50$ ) and low reliability ( $R^2 = .25$ ). This next model (now referred as Model 3) is formed by 25 items; the remaining 31 items were removed due low statistical indicators. The global fit of Model 3 is satisfactory (CFI = .92, GFI = .94, NFI = .88), with very few exceptions (Items 8, 23, 35, 45 and 51) all the items present values of item-

reliability above .25. Concerning the factor structure, all items present an adequate loading in its respective theoretical factor; only items 8, 22, 23, 25, 35, 45 and 51 did not achieve a .50 factor loading value, yet with a quite nearby value in most cases. Also, six additional paths were introduced in the model to better represent the relations between some items and other factors, which are the following: 'Past Positive→Item 22' ( $\lambda = -.30, p < .001$ ), 'Past Positive→Item 34' ( $\lambda = -.20, p < .001$ ), 'Past Negative→Item 11' ( $\lambda = -.37, p < .001$ ), 'Past Negative→Item 25' ( $\lambda = -.58, p < .001$ ), 'Present Fatalist→Item 23' ( $\lambda = .26, p < .001$ ) and 'Future→Item 35' ( $\lambda = -.26, p < .001$ ). The complete path diagram of this model can be found in the following Figure 5.

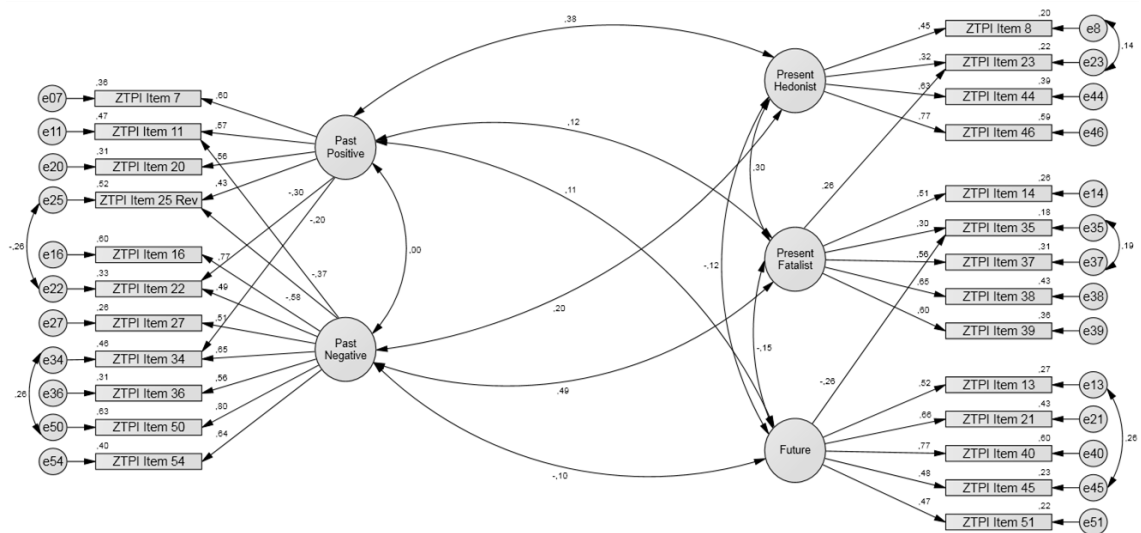


Figure 5. Brief ZTPI Confirmatory Factor Analysis Path Diagram (Model 3)

Through the comparison between the three presented models (see Table 6Table 3), it's possible to infer that the Brief ZTPI composed by 25 items (Model 3) is the most stable as well the most parsimonious (Marôco, 2010) due its values in the Akaike's Information Criterion – AIC and Modified Expected Cross-Validation Index – MECVI.

**Table 6.**  
*Portuguese ZTPI Fit Indices Comparison*

	$\chi^2$	<i>df</i>	$\Delta\chi^2$	$\Delta df$	$\chi^2/df$	AIC	MECVI	CFI	PCFI	GFI	PGFI	RMSEA
Model 1	5675	1474	-	-	3.85	5919	7.48	.62	.59	.77	.71	.06
Model 2	4925.28	1462	749.72	12	3.37	5193.28	6.57	.69	.65	.80	.73	.06
Model 3	666.20	254	5008.8	1220	2.62	808.20	1.02	.92	.78	.94	.73	.05

*Note.*  $\Delta\chi^2$  and  $\Delta df$  obtained through comparison with Model 1.

### 1.1.2 Discussion

The Zimbardo Time Perspective Inventory – ZTPI has been a highly praised instrument by the scientific community in the last decade, its factor structure when explored by Exploratory Factor Analysis present very consistent results among different cultures (Anagnostopoulos & Griva, 2012; Apostolidis & Fieulaine, 2004; Diaz-Morales, 2006; Leite & Pasquali, 2008; Liniauskaite & Kairys, 2009; Ortuño & Gamboa, 2009), still some concerns arise regarding due inconsistent results of its factor structure when studied through Confirmatory

Factor Analysis, which has varied from acceptable (Anagnostopoulos & Griva, 2012; Apostolidis & Fieulaine, 2004; Cretu, 2012), mixed (Carelli et al., 2011) or not satisfactory (Liniauskaite & Kairys, 2009; Milfont, Andrade, Belo & Pessoa, 2008). Still, making a direct comparison between these results is not practical or even possible, since each study approach on ZTPI's structure is different, while some studies choose to maintain and assess the quality of the original structure (Anagnostopoulos & Griva, 2012), others choose to remove items (Apostolidis & Fieulaine, 2004) or include new items (Carelli et al., 2011).

The goal of this chapter was to study the Portuguese ZTPI's factor structure through CFA, in our case, the original 56 items ZTPI (referred as Model 1) failed to present acceptable results in the several global fit indices analyzed, also the modified Model 2, in which the residuals of several items covariances were correlated (following as criteria the Modification Index) did not achieve acceptable results. As so, several items were removed in order to develop a brief version of ZTPI (formed by 25 items) and to achieve acceptable fit indices. This new version of ZTPI (presented as Model 3) achieved good results in all analyzed fit indices, only the chi-square test presented a inadequate result since its p-value was significant, still it's important to consider that this test is highly sensitive to large samples (Hooper, Coughlan & Mullen, 2008), which can be the reason for this result. All items presented good results regarding its factor loadings and reliabilities.

Regarding brief versions of ZTPI, Gupta et al. (2012) referred that several attempts has been made, yet divergent results have been found, since each study validates a different array of items, producing a different factor structure. Azevedo, Teixeira & Paúl (2012) has already noted the necessity of a brief ZTPI for uses in specific groups (such as older people). A previous attempt to develop a brief ZTPI in the Portuguese context (Imaginário, Oyanadel, Gamboa & Jesus, 2011) proven to be unsatisfactory, due to very low dimension reliability. Our proposed structure for a brief ZTPI has the advantage of good psychometrical indicators and a factor structure very close to the original ZTPI even when 31 items were removed. Also, we consider as an improvement in the study of ZTPI factor structure by CFA the fact to consider the cross-loadings that some items present beyond its original factor. It's the case of items 22 "*I've taken my share of abuse and rejection in the past*" and 34 "*It's hard for me to forget unpleasant images of my youth*" which are negatively associated with the Past Positive factor. The items 11 "*On balance, there is much more good to recall than bad in my past*" and 25 "*The past has too many unpleasant memories that I prefer not to think about*" which presents a negative association with the Past Negative factor, it should be noted that this item preserved its reverse coding as proposed by Zimbardo & Boyd (1999). The item 23 "*I make decisions on the spur of the moment*" which is positively associated with the Present Fatalist dimension and lastly, the item 35 "*It takes joy out of the process and flow of my activities, if I have to think about goals, outcomes, and products*" which present a negative



association with the Future dimension. Considering the items content, seems logical to us to consider these new factor loadings.

Yet, the ZTPI has been characterized as a powerful instrument not only to assess Time Perspective, but also to predict a wide array of cognitions and emotions. Being so, more studies are needed in order to explore the predictive power of this brief ZTPI.

## **1.2 TFTPS Exploratory & Confirmatory Factor Analysis**

### *1.2.1 Study 1: TFTPS's EFA<sup>12</sup>*

In order to determine the Portuguese TFTPS factor structure, an Exploratory Factor Analysis was developed through Principal Component Analysis, the rotation method was Varimax Rotation and the missing values were treated with the Listwise method, the structure was forced to converge in a unique factor<sup>13</sup>. During the analysis of EFA results were analyzed taking in consideration the eigenvalue of the extracted component, also the extractions and loadings of

---

<sup>12</sup> Fragments of this section contents and data were previously published in Ortuño, Paixão & Janeiro (2013).

<sup>13</sup> The decision of forcing the model to a unique dimension had as criterion the factor structure presented by Boyd & Zimbardo (1997), as well the Scree Plot and eigenvalues analysis. These criterions were also considered in the decision of eliminating Item 5 (see Graphic 2).

each item. The Scree Plot was also considered through Cattell's criterion (Cattell, 1966).

#### *1.2.1.1 Results*

The sample characteristics match the criteria presented by Kline (2000) to develop quality factor analysis. The Kaiser-Meyer-Olkin – KMO value was .85, result which is considered good by Pestana & Gageiro, (2008) and a value of  $p < .001$  in the Bartlett Sphericity Test.

In the Scree Plot analysis (see Figure 6) is easily recognizable a one dimension structure, since before the inflexion point exist only one component. Being so, the considered model is formed by one dimension, which is going to be called as Transcendental Future Time Perspective, which explain 44.93% of the total variance ( $M = 2.84$ ,  $SD = .76$ ,  $Min. = 1$ ,  $Max. = 4.8$ ,  $\alpha = .86$ , 10 items).

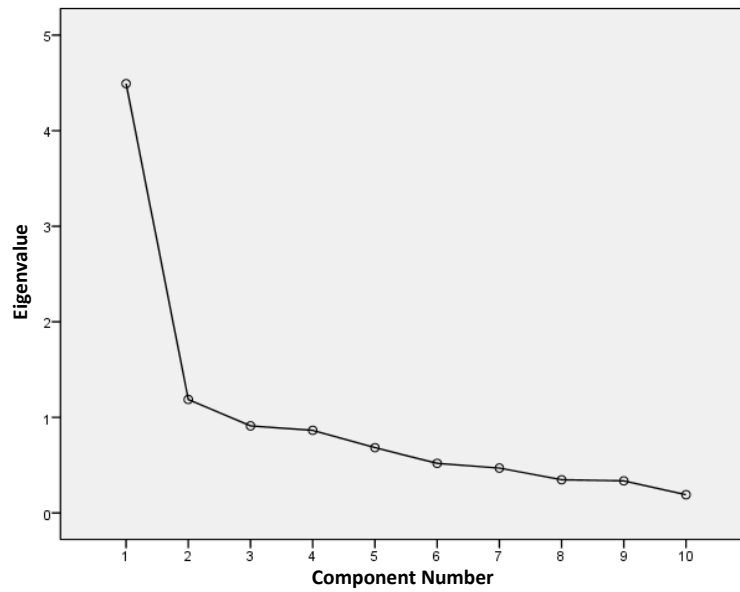


Figure 6. TFTPS Scree Plot (10 items)

All items saturated above the .30 value which is recommended by Kline (2000) to develop quality factor analysis. Also, most of the items show high communalities ( $h^2$  values  $> .44$ ). The only exception is item 5, which saturates low in the factor (.15) and presents a low communality ( $h^2 = .22$ ); the elimination of this item would represent a slight improvement of the TFTPS internal consistency. All these results are presented in detail in the Table 7.

Table 7. TFTPS Exploratory factor analysis (factor saturation, communalities, mean, standard deviation and Cronbach's alpha)

Dimension (Cronbach's $\alpha$ )	Item Nº	Item	Factor 1	$h^2$	$M$	$SD$	$\alpha$ without Item
Transcendental Future ( $\alpha = .86$ )	03	A morte não é mais do que um novo começo (Death is just a new beginning)	<b>.83</b>	.68	2.71	1.23	.83
	01	Só o meu corpo físico irá alguma vez morrer (Only my physical body will ever die)	<b>.77</b>	.59	3.09	1.25	.83
	02	O meu corpo é apenas uma habitação temporária para o meu verdadeiro eu (My body is just a temporary home for the real me)	<b>.77</b>	.59	2.71	1.21	.83
	06	Os seres humanos possuem uma alma (Humans possess a soul)	<b>.73</b>	.53	3.68	1.15	.84
	04	Acredito em milagres (I believe in miracles)	<b>.69</b>	.48	2.45	1.16	.84
	08	Serei responsabilizado pelas minhas acções na terra quando morrer (I will be held accountable for my actions on earth when I die)	<b>.68</b>	.46	2.50	1.19	.84
	10	Acredito em espíritos (I believe in spirits)	<b>.67</b>	.45	2,60	1,26	.84
	09	Há leis divinas pelas quais os seres humanos deveriam guiar a sua vida (There are divine laws by which humans should live)	<b>.66</b>	.44	2.38	1.16	.84
	07	As leis científicas não conseguem explicar tudo (Scientific laws cannot explain everything)	<b>.50</b>	.25	3.92	0.97	.85
05	A teoria da evolução explica adequadamente como é que a espécie humana apareceu (The theory of evolution adequately explains how humans came to be)	.15	.02	2.38	0.92	.87	

Note. The original items presented by Boyd & Zimbardo (1997) are presented in parenthesis.

Considering the results obtained with the item 5, it was decided to develop a new factor analysis using the same procedure but removing the item 5.

The model again is formed by a unique factor, through the analysis of the eigenvalues (Kaiser criterion) and the inflexion point in the Scree Plot (Cattell criterion), which can be confirmed in Figure 7. In fact, only the first factor shows an eigenvalue higher than one and appears before the inflexion point. This model explains 65.94% of the total variance ( $M = 2.6$ ,  $SD = .74$ ,  $Min. = .90$ ,  $Max. = 4.5$ ,  $\alpha = .87$ , 9 items), with a .89 value in the KMO index and a  $p < .001$  value in

the Bartlett Sphericity Test. This time, not only all the saturation were higher than .30, but were all higher than in the previous EFA.

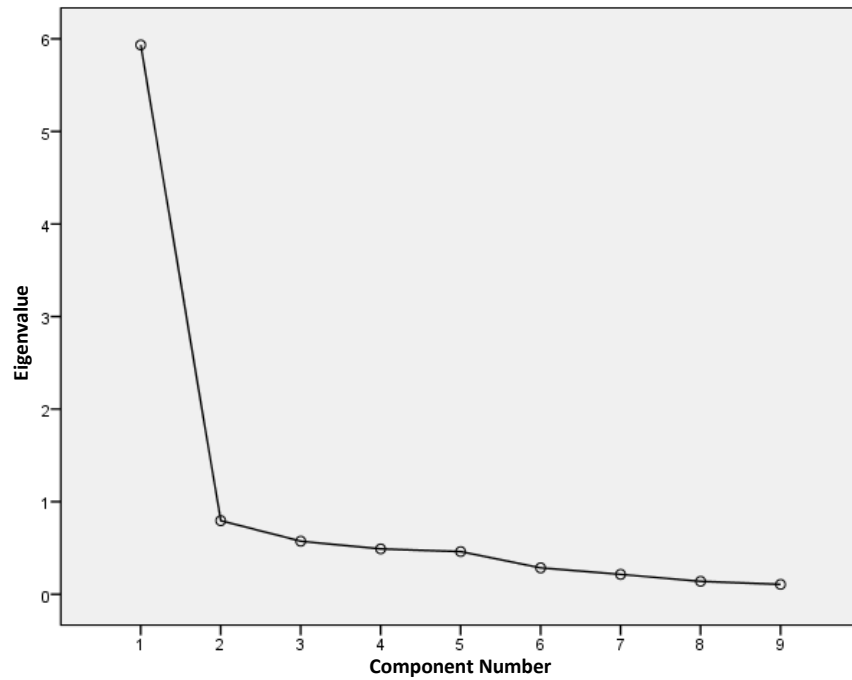


Figure 7. TFTPS Scree Plot (after item 5 removal)

### *Internal consistency*

The Cronbach's Alpha was calculated to determine the TFTPS internal consistency. Including all 10 items, the Alpha value was .86. Before the removal of item 5 the Alpha value was .87, result considered as good (Kline, 2000; Pestana & Gageiro, 2008). This results is the same that the one presented by Boyd & Zimbardo (1997) in the presentation of the original TFTPS ( $\alpha = .87$ ).

Table 8. TFTPS Exploratory factor analysis after item 5 removal (factor saturation, communalities and Cronbach's alpha)

Dimension (Cronbach's $\alpha$ )	Item Nº	Item	Factor 1	$h^2$	$\alpha$ without Item
Transcendental Future ( $\alpha = .87$ )	01	Só o meu corpo físico irá alguma vez morrer	<b>.89</b>	.80	.85
	06	Os seres humanos possuem uma alma	<b>.89</b>	.79	.86
	02	O meu corpo é apenas uma habitação temporária para o meu verdadeiro eu	<b>.88</b>	.78	.85
	03	A morte não é mais do que um novo começo	<b>.83</b>	.69	.85
	07	As leis científicas não conseguem explicar tudo	<b>.80</b>	.64	.87
	09	Há leis divinas pelas quais os seres humanos deveriam guiar a sua vida	<b>.79</b>	.63	.86
	10	Acredito em espíritos	<b>.75</b>	.56	.86
	08	Serei responsabilizado pelas minhas acções na terra quando morrer	<b>.74</b>	.55	.86
	04	Acredito em milagres	<b>.71</b>	.51	.86

### Test-retest

89 participants were asked to respond a second time to the instruments. The intention was to verify the temporal stability of the TFTPS scores. From this sample, 80 (89.9%) are female and 9 (10.1%) are male. The age range is between 17 and 30 years old ( $M = 18.85$ ,  $SD = 1.77$ ). This second collect of data occurred four weeks after the initial data collection. The correlation of TFTPS scores between the first and second moment was  $.87$  ( $p < .01$ ), score that was almost identical to the  $.86$  value presented by Boyd & Zimbardo (1997) in a four week interval. This is a positive result, either by their statistical significance, as its proximity to a  $.90$  value (Kline, 2000), evidencing the temporal stability of the Transcendental Future Time Perspective construct over time.

*Transcendental Future Time Perspective Differences among Groups*

The mean TFTP mean values comparison between female and male participants (through an Independent Sample  $t$  Test) allow to detect statistically significant differences  $t(304) = -2.1, p = .04$ , feminine participants presented higher mean values ( $M = 2.63, DP = .75$ ) when compared with male participants ( $M = 2.35, DP = .64$ ).

In order to unveil possible differences in Transcendental Future Time Perspective regarding participant's age, the Pearson correlation index was calculated, considering the TFTP mean values and the participant's age. The results shows that it doesn't exists any association between age and TFTP ( $r = .06, p = .29$ ).

In order to explore differences in TFTP by participants' grade level, it was calculated an ANOVA, which did not present significant differences among the analyzed groups ( $p = .55$ ).

*TFTP Correlations with other Temporal Dimensions*

The association between TFTP and other assessed temporal dimensions, was explored by the analysis of the correlation indices (Pearson  $r$ ). The complete results are presented in Table 9. All correlations between TFTP and the other TP's are small and statistically significant except, the correlation with Negative Future.

Table 9. Correlations between TFTP, ZTPI and TPS (only Negative Future)

	1.	2.	3.	4.	5.	6.
1. TFTP	-					
2. Past Positive – ZTPI	.17**	-				
3. Past Negative – ZTPI	.15**	-.17**	-			
4. Present Hedonist – ZTPI	.14*	.31	-.04	-		
5. Present Fatalist – ZTPI	.20**	.11*	.38**	.28**	-	
6. Future – ZTPI	.14*	.07	-.06	-.30**	-.32**	-
7. Negative Future – TPS	-.06	-.17**	.46**	-.09	.32	-.19**

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

### 1.2.1.2 Discussion

As discussed by Boyd & Zimbardo (1997) TFTP has an enormous predictive potential, since characterizes a new temporal dimension that is not restricted by the physical and temporal constraints of human life. Yet, the research about the cognitive-motivational impact of this dimension, as well for the motivational objects that compose it are still in an early stage as previously discussed in the topic 1.5.2 Transcendental Future.

Regarding the nature of TFTP, we believe that this is an integral component of Time Perspective, representing another temporal frame that, together with the other five largely studied (Zimbardo & Boyd, 1999) assists in the process of giving order, meaning and coherence to all human experience.



Within the instrumental scope, there's an important difference regarding the method used in this study and the method presented by Boyd & Zimbardo (1997) whom chosen to group TFTP items along with ZTPI's. In this study we preferred to test the TFTP as a totally independent instrument. Two reasons are behind this decision: 1<sup>st</sup>) In Boyd & Zimbardo (1997) study is not provided indications regarding the order of the joint set of TFTP and ZTPI items. And 2<sup>nd</sup>) the extensive variety of methods and instruments to assess Time Perspective or another temporality relevant concept; we believe that an independent TFTP can be easily used together with those instead of limiting its use only with the ZTPI.

At the psychometric level, the results obtained with the Portuguese TFTP are satisfactory. The factor structure is very clear, expressing only one factor with high communalities and factor loadings (see Table 8); the elimination of item 5 improves the scale psychometrics characteristics. This result was expected due item 5 content, since we believe that doesn't seem correct to oppose scientific and religious beliefs when working with a Portuguese sample; as previously referred Portugal is a country with a deeply rooted in the Catholic traditions (Menéndez, 2007), this still doesn't oppose to a country committed with education and science as becomes clear when analyzing the country's latest years statistics regarding the number of doctorates of higher education, scientific production amongst several sociodemographic indicators which improve year after year (Instituto Nacional de Estatística, 2013a, 2013b). Also, the results concerning the internal consistency and test/re-test validities are very positive

and similar to the results presented by Boyd & Zimbardo (1997). The convergent and divergent validities were also confirmed through the relations of Transcendental Future Time Perspective with the other temporal frames (see Table 9).

No statistical significant differences were found in the TFTP across the participant ages, compared with Boyd & Zimbardo (1997) study, this results is halfway coincident, since two of the four presented samples did not presented significant differences. Neither regarding course were founded significant differences. Yet, these results may be biased due a low heterogeneity of the sample regarding sample age and academic course.

About gender differences in TFTP scores, significant differences were found, being the female participants those with higher scores in TFTP, this results match the results presented by Boyd & Zimbardo (1997) regarding this issue.

The TFTPS was conceived by its authors considering an ecumenical approach, trying to not reflect any conceptions or opinions directly related with any religion in particular. However, a analysis of TFTPS items makes us believe that its content in several items reflects beliefs deeply related with religious thinking and spirituality, for example the idea of life after the physical death (item 1) or the punishment for life actions (item 8), among others. We believe that the Transcendental Future Time Perspective is formed by other topics beyond religion; this should be considered in future revisions of this instrument.

Moreover, it could be possible to consider as related with TFTP any motivational object or content of a secular nature that guides the individual's behaviour to a goal that can only be achieved after its lifetime or at its life cost? Let's consider as examples activists politicians or military personnel which are willing to sacrifice their lives in favor of better socioeconomics conditions or more freedom for its country, just to mention a few. In fact, an individual can easily consider that an objective of this magnitude just can be achieved after their physical death. Therefore, their preoccupation is not focused in what is going to happen with the individual's per se, but what is going to happen with the world after their deaths.

So far, has been believed that with an age increase, decreases the importance of the temporal variables in human behaviours, cognitions and emotions (Krajcir & Sundberg, 1979; Lennings, 2000). Yet, this conclusion might be wrong since studies have not considered TFTP, is our belief that individuals in the late stage of its life experience a change in its temporal functioning, mainly due a notion of ending its own lifetime.

Thus, seems important to us to reinforce the idea that the inclusion of Transcendental Future Time Perspective dimension in the analysis of individuals temporal profile, it adds "more life" to individual's existential space.

To finish, we would like to refer that the study main limitation is the sample's characteristics, which present little heterogeneity.

### 1.2.2 Study 2: TFTPS's CFA

Following the EFA of TFTPS, we decided to provide more information about its factor structure, developing a CFA of it. The intent is to discover how well the factor structure proposed by Boyd & Zimbardo (1997) or the structure proposed by us in the last sub-chapter fit the collected data.

#### 1.2.2.1 Results

The normality of distributions assumption was tested prior to the Confirmatory Factor Analysis – CFA. The values of Asymmetry and Kurtosis did not indicate any violations to the principle of the univariate normality since  $sk < 3$  and  $ku < 10$  (Marôco, 2010). Yet, the multivariate normality presented a slight deviation ( $ku = 11.03$ ), we consider this as having no particular concern, since in the presence of cases of violation of normality the Maximum Likelihood method generates centered estimates for the parameters (Maroco, 2010).

The first model to be tested (Model 1) is formed by the 10 original TFTPS items proposed by Boyd & Zimbardo (1997) organized in a one-dimension structure. This model failed to achieve acceptable global fit indices (CFI = .65, GFI = .87, NFI = .84), also the chi-square and RMSEA tests presented p-values  $< .05$ , which indicates a poor adjustment of the model to the present data. Regarding the items, Item 5 showed particularly bad results in the factor loading ( $\lambda = .07$ ,  $p = .134$ ) and item-reliability ( $R^2 = .01$ ), the entire path diagram of this model can

be found in Figure 8. Considering this result and the recommendations of Ortuño, Paixão & Janeiro (2013), it was decided to remove Item 5 and test the adjustment of this new model, which it's named as Model 2. The new model presented a minor improvement in its adjustment quality (CFI = .86, GFI = .86, NFI = .85) when compared with Model 1, yet we consider that this improvement is so small, that reflects only the simplification of the model (since it present less parameters) and not a real improvement of the adjustment. All the items presented good factor loadings ( $\lambda = .50$ ) and reliabilities ( $R^2 = .25$ ) with the exception of item 7 ( $\lambda = .43$ ,  $R^2 = .19$ ). The path diagram of this model can be found next in Figure 9.

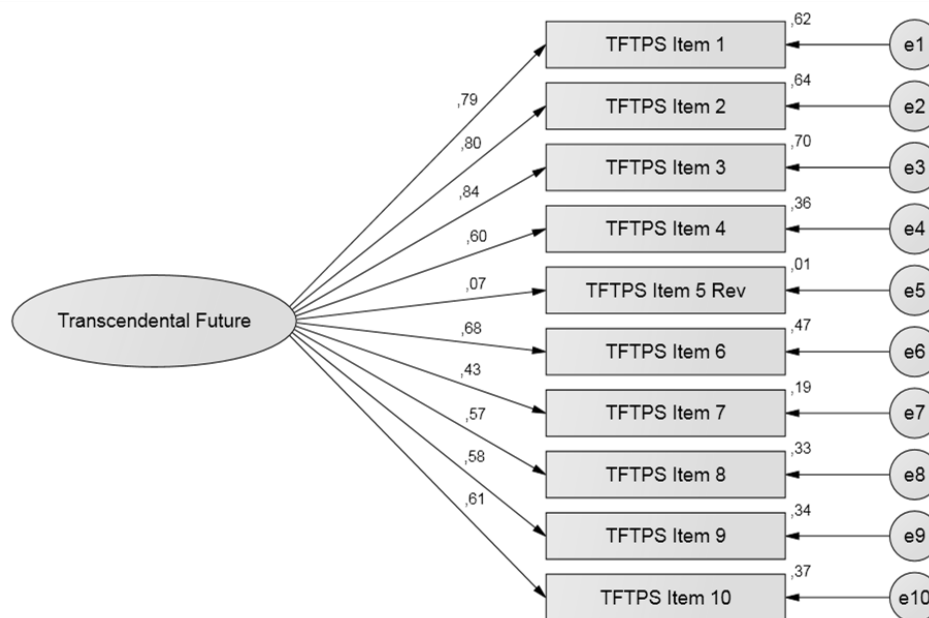


Figure 8. TFTPS Confirmatory Factor Analysis Path Diagram (Model 1)

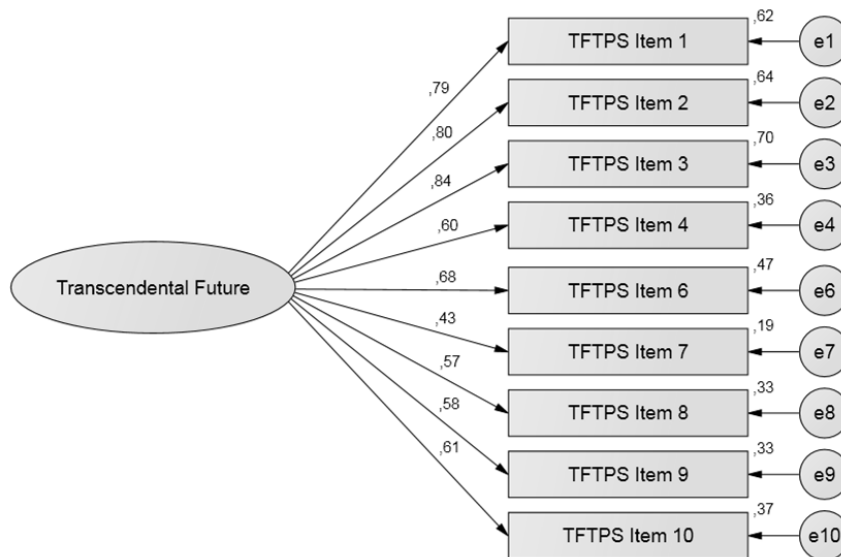


Figure 9. TFTPS Confirmatory Factor Analysis Path Diagram After Item 5 Removal (Model 2)

Considering the obtained results with Model 2, it was decided to make a few modifications in the model in order to achieve an acceptable fit of the model. Two items were deleted from the model; Item 7 was due its low reliability and factor loading and Item 2 was due its values in the Modification Index, since it shared a high amount of covariances with most than a half of the remaining items of the TFTPS. Also four trajectories between item residuals were fixed, since presented Modification Index values that suggested that association ( $MI > 11$ ). The results of all these modifications in the model can be found in Figure 10 (the model Path Diagram) and Table 10 (a detailed comparison between models). The model presented a very good fit to the data ( $CFI = .99$ ,  $GFI = .99$ ,  $NFI = .99$ ), as well all the trajectories present an elevated statistical significance ( $p < .001$ ),

with all items presenting good factor loadings ( $\lambda \geq .50$ ) and good reliabilities ( $R^2 = \geq .35$ ).

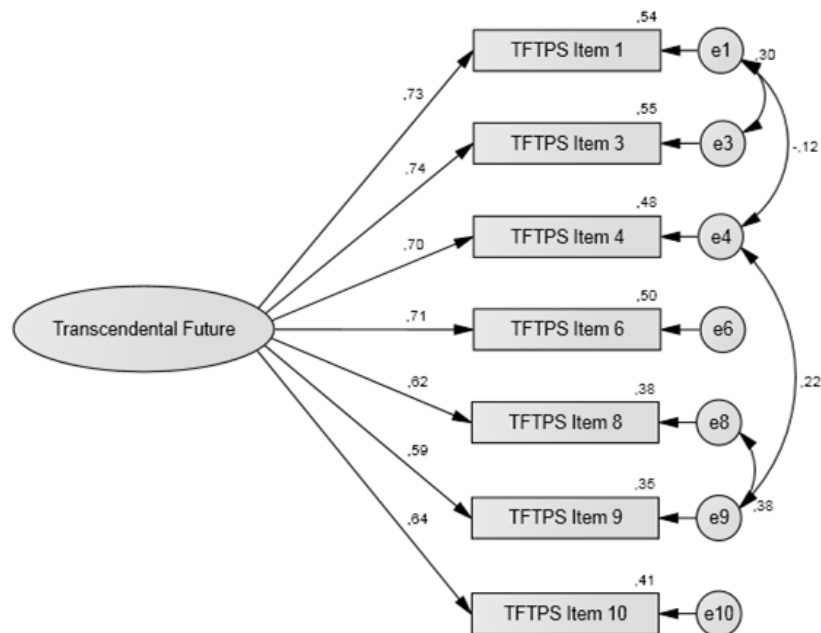


Figure 10. TFTPS Confirmatory Factor Analysis Final Path Diagram with 7 Items (Model 3)

Considering the results presented in the Table 10, the model composed by seven of the original TFTPS items (Model 3) is considered as the more parsimonious, as well as the more stable in the studied population (Marôco, 2010) in comparison with the two previous models: Model 1 composed by the 10 original items and Model 2 which presented the same composition, with the sole exception of the Item 5 removal. Model 3 presented the lowest values in the Akaike's Information Criterion – AIC (AIC = 69.93) and Modified Expected Cross-

Validation Index – MECVI (MECVI = .09) of all three models. Also, the obtained differences in the  $\chi^2$  estimate due modifications in the original model, reflects that Model 3 improves more and it has a better adjustment than Model 2 (Model 3  $\Delta\chi^2 = 296.44 >$  Model 2  $\Delta\chi^2 = 17.39$ ).

Table 10. Portuguese TFTPS Fit Indices Comparison

	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	$\chi^2/df$	AIC	MECVI	CFI	PCFI	GFI	PGFI	RMSEA
Model 1	330.37	35	-	-	9.44	370.37	.74	.85	.66	.87	.55	.13
Model 2	312.98	27	17.39	8	11.59	348.98	.70	.86	.64	.86	.52	.14
Model 3	33.93	10	296.44	25	3.39	69.93	.09	.99	.48	.99	.35	.03

Note.  $\Delta\chi^2$  and  $\Delta df$  obtained through comparison with Model 1.

### 1.2.2.2 Discussion

After testing three different models regarding the TFTPS structure, we've reached a structure that consider satisfactory. The best model accomplished was Model 3, which is composed by seven items. Still, we consider important to reflect on the content of two of the removed items, since they share a theme related with science or a positioning against science and its conclusions. Ortuño, Paixão & Janeiro (2013b) has already discussed about this, arguing that in the Portuguese culture it doesn't make sense to oppose science with religion, is our



position that the content of these two items has little to do with the Transcendental-Future Time Perspective.

The final model presented high reliabilities and factor loadings in all its items, all the trajectories are statistical significant. Also, the global fit is good in all the studied indices.

### **1.3 AISS Exploratory & Confirmatory Factor Analysis**

This subchapter aims to present the results of the Portuguese adaptation of the 20 items Arnett Inventory of Sensation Seeking – AISS. At first, Two Exploratory Factor Analyses are presented together with an internal consistency analysis, item quality measures and subscale quality examination (Study 1). Then, we tested the data adequacy to three models of Structural Equation Modeling, global model indices are presented, as well model comparative indices (Study 2). And last, it's examined the differences in AISS scores between genders, age and its association with other personality traits (Study 3).

#### ***1.3.1 Study 1: AISS EFA***

In order to determine the Portuguese AISS factor structure, two Exploratory Factor Analysis through Principal Component Analysis were carried out. The first one, was performed with Varimax Rotation and the number of components defined by the Kaiser Criterion (only components with eigenvalues higher than one were considered). Still, this solution it's difficult to interpret since extracts seven components (consult Table 11), which is substantially different from the two component solution proposed by Arnett (1994). Also, the Scree Plot analysis (see Figure 11) suggest the extraction of only one (maximum two) components; taking into account Cattell (1965) recommendations.

#### *1.3.1.1 Results*

The total variance explained by this model is 54.99%; the KMO index is .69 and the Bartlett's Sphericity Test presents a value of  $p < .01$ . The communalities of all items are acceptable, ranging from .38 to .70.

**Table 11.**  
*AISS Unrotated Component Matrix (20 items)*

Item Nº	Components							$h^2$
	1	2	3	4	5	6	7	
19	.61					-.43		.59
18	.58			-.32				.47
11	.57					-.38		.62
20	.56		.35					.62
9	.52		-.39					.51
16	.45		.33	-.41				.59
8	.43				.36		-.35	.63
12	.42						-.33	.41
17*		.58				.52		.70
13*		.54		.42				.60
14	.39	-.51		.38				.60
15	.42	-.50		.37				.64
6*	.35	.48						.43
5	.31		-.48		.31		.31	.59
2*					.54			.46
1	.33		-.35		-.43			.49
3*			.34		.42			.38
7						.52	-.43	.59
10*			.46				.49	.56
4	.33			-.32			.39	.54

Note. Items marked with \* are reverse coded.

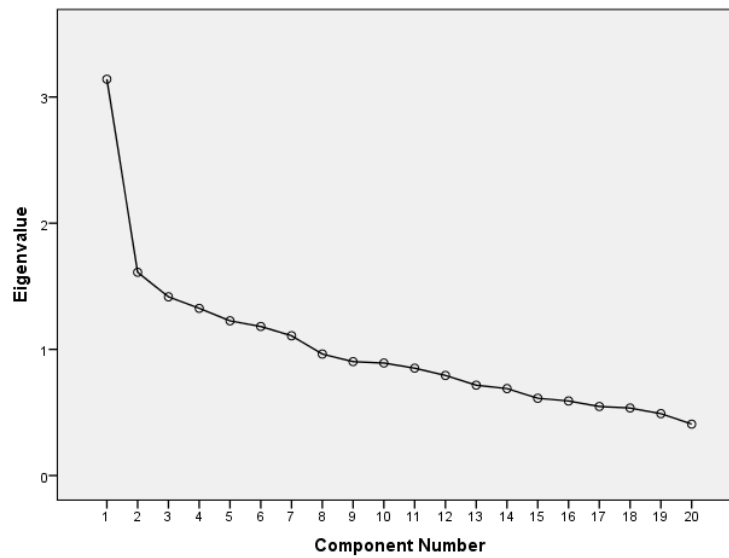


Figure 11. AISS Scree Plot (20 items)

However, the rotated component matrix produces a more intelligible factor structure (see Table 12). Nevertheless, five AISS items present loadings in two factors (items nº 1, 6, 7, 12 and 18). Considering the items content, we defined the factors in the following way: Factor 1, Travel. Factor 2, Intensity. Factor 3, Sensorial Complexity. Factor 4, Reckless. Factor 5, Taste. Factor 6, Constancy and Factor 7, Social Excitements. Still, this factor structure is not satisfactory due cross-loadings and some items content, which doesn't fall into a logical category.

**Table 12.**  
*AISS Rotated Component Matrix*

Item Nº	Components						
	1	2	3	4	5	6	7
11	.76						
19	.72						
9	.56						
16		.75					
20		.74					
18		.47		.43			
12	.35	.41					
15			.78				
14			.75				
5				.73			
4				.70			
17*					.81		
13*					.75		
2*						.58	
3*						.58	
1	.40						-.49
6*					.30	.38	
8							.59
10*							-.57
7			.46				.57

*Notes.* Items marked with \* are reverse coded. Rotation converged in seven iterations.

Considering this preliminary results, a second EFA was developed, this time using again Principal Component Analysis but with the structure being forced to converge in a unique factor and removing several items that failed to present acceptable communalities, factor loadings and did not affect the

inventory's internal consistency (the removed items were nº 2, 3, 6, 7, 10, 13, 15 and 17).

In order to define the final factor structure, the eigenvalue of the extracted component were analyzed, as well the communalities and factor loadings of each item, this decision is also based in the fact that in the previous EFA (without forcing the number of factors) nearly all items loaded above .30 value in the first factor. The Scree Plot was also considered through Cattell's criterion (Cattell, 1966).

Through the KMO index (.72) and the Bartlett's Sphercity Test ( $p < .001$ ), it is possible to infer that the sample has enough quality to be used in this EFA. Regarding the factor structure, an analysis of the Scree Plot (Figure 12) suggests a one factor structure, since just one component appears before the inflection point.

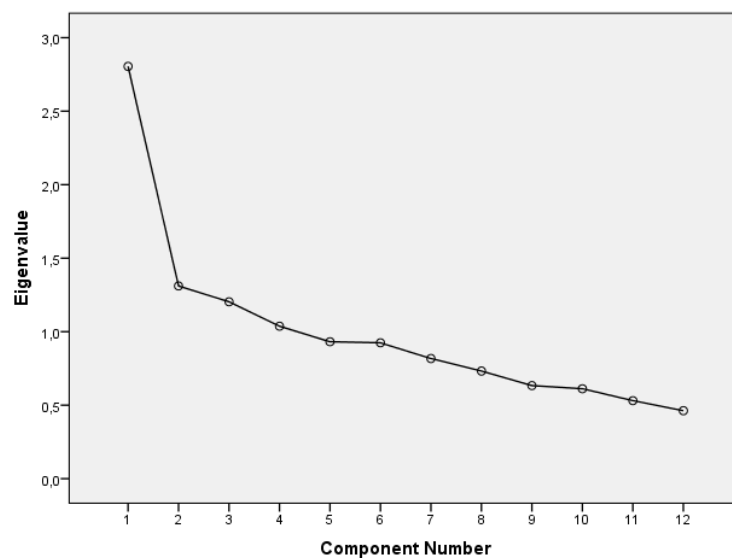


Figure 12. AISS Scree Plot (12 Items)

This first and only component is going to be referred as Sensation Seeking, since it result from the merge of the previously proposed concepts of Novelty and Intensity (Arnett, 1994), which were conceptualized as dimensions of a more general concept termed Sensation Seeking. This one-component model explains 23.37% of the total variance ( $M = 2.39$ ,  $SD = .97$ ,  $Min. = 1.45$ ,  $Max. = 3.48$ , 12 items,  $\alpha = .69$ ). In this EFA all items achieved factor loadings higher than .30 and half of the items presented acceptable communalities. None of the items removal would enhance the inventory internal consistency. Only four items present an Item-Total Correlation value equal or greater than .4 (as recommended by Field, 2013). Please consult Table 13 for more detailed information.

**Table 13.**  
*AISS Rotated Component Matrix, Communalities, Descriptive Statistics and Internal Consistency (12 items)*

Dimension (Cronbach's $\alpha$ )	Item Nº	Item	Factor 1	$h^2$	$M$	$SD$	Item-Total Correlation	$\alpha$ without Item
Sensation Seeking ( $\alpha = .69$ )	19	Se fosse possível visitar de graça outro planeta ou a lua eu estaria entre os primeiros interessados (If it were possible to visit another planet of the moon for free, I would be among the first in line to sign up)	.63	.40	3.06	1.05	.44	.65
	18	Gosto da sensação de estar perto da berma de um sítio alto enquanto olho para baixo (I like the feeling of standing next to the edge on a high place and looking down)	.60	.36	1.74	.96	.44	.65
	11	Gostaria de ter sido um dos primeiros exploradores de uma terra desconhecida (I would have enjoyed being one of the first explorers of an unknown land)	.59	.34	2.62	1.06	.41	.65
	20	Compreendo como pode ser emocionante estar numa batalha durante uma Guerra (I can see how it must be exciting to be in a battle during a war)	.56	.31	1.67	.94	.37	.66
	9	Gostaria de viajar para lugares desconhecidos e longínquos (I would like to travel to places that are strange and far away)	.54	.29	3.48	.74	.40	.66
	16	Seria interessante assistir a um acidente de carro (It would be interesting to see a car accident happen)	.46	.21	1.45	.78	.31	.67
	8	Num parque de diversões prefiro sempre andar na montanha russa ou outras atracções com velocidade (If I were to go to an amusement park, I would prefer to ride the rollercoaster or other fast rides)	.44	.19	2.62	1.12	.30	.67
	12	Gosto de filmes com muitas explosões e perseguições com carros (I like a movie where there are a lot of explosions and car chases)	.44	.19	1.98	1.00	.29	.67
	4	Gosto de ouvir música com volume muito alto (When I listen to music, I like it to be loud)	.38	.14	2.89	.97	.26	.68
	1	Consigo ver que poderia ser interessante casar com alguém de um país estrangeiro (I can see how it would be interesting to marry someone from a foreign country)	.35	.13	2.39	1.02	.23	.68
	5	Caso tenha que viajar acho melhor não fazer muitos planos e ver como corre (When taking a trip, I think it is best to make as few plans as possible and just take it as it comes)	.34	.12	2.47	.97	.24	.68
	14	Prefiro trabalhar sob pressão (In general, I work better when I'm under pressure)	.34	.11	2.28	1.01	.23	.68

Note. The original items presented by Arnett (1994) are presented in parenthesis.



### 1.3.1.2 Discussion

The aim of this study was to present the Portuguese linguistic and cultural adaptation of the Arnett Sensation Seeking Inventory – AISS. In order to achieve an acceptable model it was necessary to undergo several modifications. In first place, we were unable to replicate the 20 items bi-factorial structure proposed by Arnett (1994) composed by the Novelty and Intensity components. Instead, a one-factor structure was achieved, with a lesser number of items. Eight items were removed after considering its poor performance concerning factor loadings, communalities and contribution for the model's internal consistency. The result obtained in the Scree Plot also confirms the choice of a one factor solution. Using the proposed model a considerable amount of variance is explained (23.37%) with a minimally acceptable internal consistency of .69 (Almeida & Freire, 2003; Kline, 2000; Pestana & Gageiro, 2008); Field (2013) refers that a .70 cut point can be acceptable when studying personality variables (which is the case of Sensation Seeking). These results are highly similar to the results presented previously by other authors concerning AISS internal consistency (Arnett, 1994; Carretero-Dios & Salinas, 2008; Desrichard et al., 2008).

Still, we believe that this set of 12 items are measuring something else aside the Sensation Seeking concept, since the communalities are fairly low (ranging from .11 to .40) when compared with the EFA with seven components (with a range of .38 to .70). In other words, the chosen model explains a low amount of item variance. In the French AISS adaptation research, Desrichard et

al. (2008) also argues that some AISS items are not measuring the supposed factor.

### 1.3.2 Study 2: AISS CFA

In order to assess the quality of the above mentioned model, a CFA using structural equation modeling with maximum likelihood estimation was employed to test the 12 item AISS factor structure (Figure 13) in the same sample presented in the previous study. All the variables presented a normal univariate distribution ( $sk < 3$ ;  $ku < 10$ ), as well multivariate distribution ( $ku < 10$ ). All items were tested for multicollinearity, no problems were found since all the items presented VIF values around 1, which is a clear indicator of the absence of multicollinearity (Marôco, 2010). In addition, the modification indices, also suggested a correlation between the unique variances between items 4-5 (MI = 13.69) and 16-20 (MI = 30.21), so these parameters were added to the model.

#### 1.3.2.1 Results

Regarding the overall model fit, acceptable to good fit in some indices ( $\chi^2/df = 2.33$ , PCFI = .66, GFI = .94, PGFI = .63) were achieved, but in other indices this objective was not accomplished (CFI = .84, NFI = .76, RMSEA ( $p < .07$ ) = .06). Regarding each item factorial weight, the results are not encouraging, since the 12 items range value is from .24 to .62 and most of the items are below the  $\lambda$

$\geq .50$  mark proposed by Marôco (2010) as adequate for this kind of analysis. Also, the item variance explained by the model is in most cases not acceptable, only four items (nº 9, 11, 18 and 19) presented  $R^2 \geq .25$  values (as recommended by Marôco, 2010).

Regarding the association between items 4 and 5, it was small but statistically significant ( $r = .21, p < .001$ ). Also, the association between items 16 and 20 presented similar values ( $r = .33, p < .001$ ).

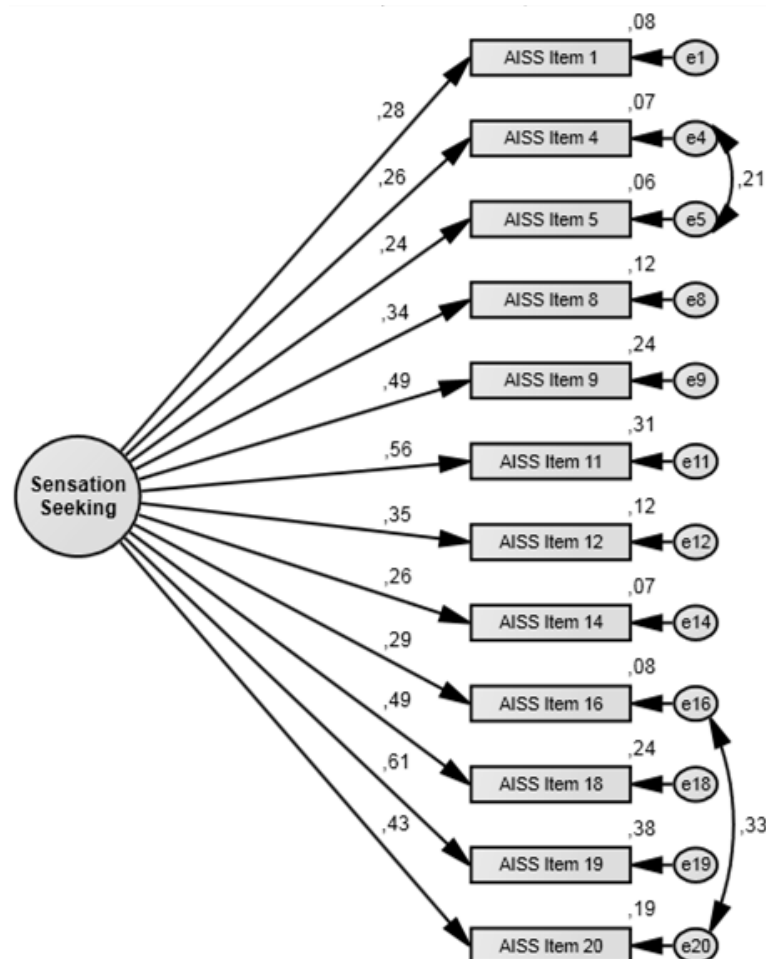


Figure 13. AISS Model Path Diagram of Model 3 (Standardized Estimates)

However, we decided to compare the original two-factor structure (referred as Model 1) proposed by Arnett (1994), a one-factor solution with all the original 20 items (Model 2) and our 12 items version (Model 3) in order to determine if our solution is the best it can be achieved with the collected data.

**Table 14.**  
*AISS Fit indices and model comparison*

	$\chi^2$	<i>df</i>	$\Delta\chi^2$	$\Delta df$	$\chi^2/df$	AIC	MECVI	CFI	PCFI	GFI	PGFI	NFI	RMSEA
Model 1	392.67	169	-	-	2.32	474.67	1.42	.66	.58	.90	.72	.53	.06
Model 2	424.90	170	-32.23	-1	2.50	504.90	1.51	.61	.54	.89	.72	.50	.07
Model 3	121.24	52	271.43	117	2.33	173.24	.52	.84	.66	.94	.63	.76	.06

*Note.*  $\Delta\chi^2$  compared with the original two factor with 20 items model.

Considering the results accessible through the Table 14, Model 3 it's considered as the more parsimonious, as well as the more stable in the studied population (Marôco, 2010) due the showed values in the Akaike's Information Criterion – AIC and Modified Expected Cross-Validation Index – MECVI in all three models, as presented the lowest values in those estimates (AIC = 173.24, MECVI = .52). Also, considering the differences in the  $\chi^2$  estimate compared with the original Model 1 (Model 3  $\Delta\chi^2 = 271.43 >$  Model 2  $\Delta\chi^2 = -32.23$ ), Model 3 appears as the best model.

### 1.3.2.2 Discussion

The aim of this study was to assess the quality of the model presented in Chapter 1.3.1 regarding the Portuguese AISS factor structure, the chosen methodology was structural equation modeling. The one-factor model composed by 12 items presented acceptable overall fit in some indices, even when compared with two other solutions (two-factor and one-factor with the original 20 items). Yet, as observed in Figure 13 most AISS12 items failed to present factor weights nearby or higher the .50 lambda value (only items 9, 11, 18, 19 and 20 showed good results in this matter) as recommended by Marôco (2010). Also, the items reliabilities were mostly low, failing to reach the .25 r-squared mark (Marôco, 2010), again the same five items previously referred (9, 11, 18, 19 and 20) were the ones presenting a good result.

Only two pairs of items presented a significant correlation, supported by the modification index, the  $p$  value and the intensity of those correlations. This doesn't seem a problem since we're defending a one factor solution and the removal of any of these items wouldn't improve the inventory internal consistency. Still, it's important to consider that, even when only two paths are being fixed because the modification indices and that parameters alteration doesn't represent a large change in the global model adjustment, this solution may not fit new data. Being so, this model should be tested in other samples in order to guarantee its validity and stability.

This recommended factor structure for the Portuguese AISS is different to any other previously proposed by other authors. For a brief comparison between

structures consult Table 15. Still, considering that most AISS versions exhibits a different combination of the original items, seems to be highly consensual among authors that the original 20 item structure proposed by Arnett (1994) requires improvements in order to be a valid and reliable inventory.

**Table 15.**  
*AISS International Versions Factor Structure Comparison*

Country	Authors	Number of Items			Internal Consistency		
		Total	Novelty	Intensity	Total	Novelty	Intensity
U.S.A.	Arnett (1994)	20	10	10	.70	.50	.64
Portugal	Ortuño, Paixão & Janeiro (in press)	12	5	7	.69	.56	.57
Italy*	Smorti & Guarnieri, 2013	17	7	10	.70 .71	.56 .60	.60 .64
Spain	Carretero-Dios & Salinas (2008)	20	10	10	.69	.55	.62
France <sup>a</sup>	Desrichard et al. (2008)	17	8	9	.62 .71	.56 .62	.59 .59
Germany	Roth & Herzberg (2004)	12	5	7	.60	.57	.59
U.K.	Haynes et al. (2000)	13	6	7	-	-	-

<sup>a</sup>Two samples were analyzed

### 1.3.3 Study 3: AISS Group Differences & Correlations

#### 1.3.3.1 Results

Regarding gender differences an Independent Sample T Test was performed. We've found that male participants ( $M = 2.66$ ,  $SD = .43$ ) showed higher Sensation Seeking scores than female participants ( $M = 2.33$ ,  $SD = .45$ ), these differences are statistically significant  $t(338) = 5.34$ ,  $p < .001$ . The Levene

Test was not significant ( $F = .09$ ,  $p = .77$ ) which indicates that exist equal variances among those two groups.

A linear correlation was calculated between participant's age and AISS score. The results indicates a negative, non-significant correlation between those two variables ( $r = -.09$ ,  $p = .09$ ). Still, it was decided to perform a partial correlation controlling the effect of gender in this correlation; in this case the association between those two variables is still negative but slightly stronger ( $r = -.14$ ,  $p < .05$ ) if compared with the previous results, also the correlation is now statistically significant. Considering this, the same correlation (age-AISS12) was calculated for each gender, male participants presented a negative and non-significant correlation ( $r = -.18$ ,  $p = .16$ ) while female participants showed a negative and significant correlation ( $r = -.13$ ,  $p < .05$ ).

In order to explore the nature of the relations between Sensation Seeking and other constructs, the correlations of AISS12 with ZTPI, TPS, TFTP, CFCS, SWLS, RSES and BDES were calculated. Male participants presented significant correlations only with Present Hedonist ( $r = .27$ ,  $p < .05$ ). Female participants showed a wider range of significant correlations: Past Positive ( $r = .16$ ,  $p < .05$ ), Present Hedonist ( $r = .37$ ,  $p < .01$ ), Future ( $r = -.23$ ,  $p < .01$ ), Future Negative ( $r = .21$ ,  $p < .01$ ), Immediate ( $r = -.17$ ,  $p < .01$ ). More details can be found in Table 16.

**Table 16.**  
*AISS12 Correlations (ZTPI, TPS, TFTP, CFCS, SWLS, RSES & EBDS)*

	AISS12		
	Male	Female	Total Sample
Past Positive – ZTPI	-.05	.16*	.05
Past Negative – ZTPI	.07	.09	.06
Present Hedonist – ZTPI	.27*	.37**	.31**
Present Fatalist – ZTPI	.02	.07	.06
Future – ZTPI	-.19	-.23**	-.27**
Future Negative – TPS	-.01	.21**	.20**
Transcendental Future – TFTP	.10	-.02	-.05
Future – CFCS	-.03	.08	.08
Immediate – CFCS	-.20	-.17**	-.19**
Satisfaction with Life – SWLS	-.14	-.13	-.13
Self-Esteem – RSES	.002	-.08	-.01
Social Desirability – EBDS	.24	.06	.10

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

### 1.3.3.2 Discussion

The differences in AISS total score among genders present the same pattern (male > female) that previous studies (Arnett, 1994; Desrichard et al., 2008; Lourey & McLachlan, 2003; Roth & Herzberg, 2004). Regarding age differences, a small but statistical significant correlation was found between participant's age and AISS total score when controlling the effect of gender. This



is an expected result since young groups are most oriented for Sensation Seeking than adults (Arnett, 1994), yet it is possible that the strength of the correlation wouldn't be higher since the AISS items were designed to avoid age interference (Arnett, 1994). Still, it is important to be cautious about any interpretation of those results, since the collected sample is mostly composed by young college students. Previous researches also support this finding concerning the decrease of Sensation Seeking with age (Arnett, 1994).

Female participants presented several statistically significant correlations between Sensation Seeking (AISS12) and other psychological constructs, the positive correlations were with Past Positive, Present Hedonist and Future Negative. The negative correlations were with Future and Consideration of Immediate Consequences. In contrast, male participants presented only one statistically significant correlation with Sensation Seeking, a positive correlation with Present Hedonist. The positive association between AISS12 score and Present Hedonist was expectable, due to the notions of present enjoyment related with both constructs. Previous studies have also found the same correlational pattern (Keough et al., 1999; Zimbardo & Boyd, 1999). The absence of correlation between sensation seeking, Past Positive and Past Negative as well the negative correlation with Future were also reported by Zimbardo & Boyd (1999). The positive correlation with the TPS Future Negative can be related with a higher sense of the Consideration of Future Consequences (Petrocelli, 2003; Vásquez, Martín, Ortuño, Esteves & Joireman, in press) and Future Time

Perspective (Ortuño & Janeiro, 2009; Zimbardo & Boyd, 1999; Zimbardo et al., 1997) that female participants generally report, when compared with male participants. In other words, this could mean that a woman can report higher values of Sensation Seeking trait, still this doesn't stand as a lack of knowledge about the possible consequences of the behaviours related with this trait. No significant correlation was found between AISS12 scores and the Future subscale of the CFCS, still with the Immediate subscale, a small and significant correlation was found, which can be related with a higher awareness of the consequences of present behaviour when engaging in reckless behaviour; a cognitive process similar to the previously commented association of Sensation Seeking and Negative Future Time Perspective. The other assessed psychological constructs, Satisfaction with Life, Self-Esteem and College Integration did not present any expressive or significant correlation with the Sensation Seeking construct. So we believe that Sensation Seeking doesn't influence in any positive or negative way those constructs.

#### **1.4 TEIC Exploratory & Confirmatory Factor Analysis**

This chapter will introduce the several phases of the construction of the Temporal Extension Inventory of Coimbra – TEIC. All data is grouped into three

studies, Study 1 (see 1.4.1) will be dedicated to the Exploratory Factor Analysis of TEIC. The second study, Study 2 (see 1.4.2) is related with the Confirmatory Factor Analysis of this inventory. The third study (1.4.3) will explore the differences in Temporal Extension between several groups.

### *1.4.1 Study 1: TEIC EFA*

#### *1.4.1.1 Results*

In order to study the factor structure of TEIC, an Exploratory Factor Analysis with Principal Components Analysis was carried out. The chosen rotation was Direct Oblimin (oblique), because it is conceptually expected an association between the theoretical components. Amongst the several existent oblique rotations techniques, we have chosen Direct Oblimin following Kline (1994) and Field (2013) recommendations. The retained components were defined by i) the theoretical proposed structure to the TEIC, ii) the Kaiser Criterion (only components with eigenvalues higher than one were considered) and iii) an analysis to the Scree Plot (Cattell (1965)). The reading of the KMO index (.78) as well as the significance of the Bartlett's Sphericity Test ( $p < .001$ ) indicates that exist sample adequacy for those statistical procedures. The items nº 4 and nº 11 were removed due to its control nature.

Through the Scree Plot analysis (Figure 14) and considering Cattell (1965) guidelines, two or three components must be extracted. This result is concordant with the factor structure obtained.

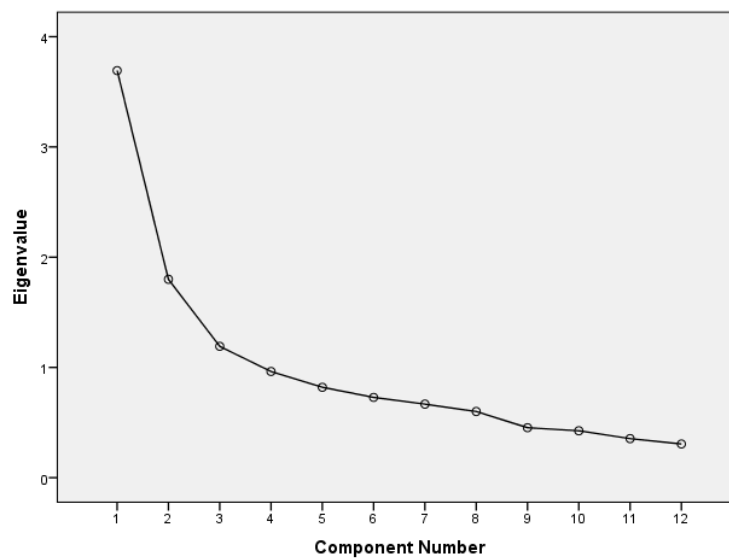


Figure 14. TEIC Scree Plot

The existence of correlations showed in Table 17 between components, confirms the possibility of an oblique structure between components (Field, 2013; Pestana & Gageiro, 2008).

**Table 17.**  
*TEIC Component Correlation Matrix*

	1.	2.	3.
1. Component 1	-		
2. Component 2	.28	-	
3. Component 3	.07	.17	-

TEIC's Factor Structure as well some psychometric characteristics are presented in Table 18. The EFA revealed three unique factors; the first will be named Past Temporal Extension ( $M = 20.60$ ,  $SD = 6.77$ , explained variance = 30.77%, 6 items,  $\alpha = .83$ ). The second, Future Temporal Extension ( $M = 15.06$ ,  $SD = 5.60$ , explained variance = 14.99%, 4 items,  $\alpha = .70$ ). And the third and last, Future Work Temporal Extension ( $M = 9.57$ ,  $SD = 1.86$ , explained variance = 9.93%, 2 items,  $\alpha = .41$ ). The total model explains 55.69% of the total variance.

The items factor loadings are very high, ranging from .59 to .86 in its respective factor. None of items load simultaneously in two or more factor above the .30 value. The items communalities are also very high, showing values between .41 and .71.

Considering several recommendations regarding the Cronbach Alpha analysis (Almeida & Freire, 2003; Kline, 2000; Pestana & Gageiro, 2008), it is possible to defend that the TEIC internal consistency is good regarding the Past

Temporal Extension subscale ( $\alpha = .83$ ), acceptable regarding the Future Temporal Extension subscale ( $\alpha = .70$ ) and unacceptable regarding the Future Work subscale ( $\alpha = .41$ ), still this last results is probably caused by the small number of items forming that subscale (two items). No item removal would improve the internal consistency of any of the three subscales.

**Table 18.**  
TEIC Factor Structure (Pattern Matrix) and Psychometric Characteristics

Dimension (Cronbach's $\alpha$ )	Item Nº	Item	Factor 1	Factor 2	Factor 3	$h^2$	$M$	$SD$	$\alpha$ without Item
Past Temporal Extension ( $\alpha = .83$ )	12	Recordo com frequência as decisões que tomei nos últimos	.79			.62	3.12	1.51	.79
	13	Relembro com frequência assuntos que ocorreram no meu trabalho nos últimos	.79			.64	2.73	1.47	.79
	9	É com alguma frequência que relembro os trabalhos que tive nos últimos	.73			.54	2.73	1.48	.80
	8	Penso regularmente em assuntos ou acontecimentos dos últimos	.70			.55	2.97	1.67	.80
	10	Tenho presente no meu pensamento pessoas com as quais convivi nos últimos	.69			.45	4.69	1.57	.82
	14	Consigo lembrar-me facilmente de ocasiões que vivi com outras pessoas nos últimos	.68			.49	4.36	1.54	.81
Future Temporal Extension ( $\alpha = .70$ )	7	Usualmente imagino como serão as minhas relações nos próximos		.86		.71	3.74	1.95	.54
	3	Costumo pensar em que tipo de relação e com que tipo de pessoa estarei nos próximos		.81		.61	4.23	2.14	.63
	6	É habitual da minha parte fazer planos ou delinear projectos para os próximos		.60		.41	2.83	1.86	.68
Future Work Temporal Extension ( $\alpha = .41$ )	1	Tenho por habito pensar como será a minha vida daqui a		.59		.44	4.26	1.77	.67
	2	No que respeita à minha profissão, sei onde quero estar daqui a			.82	.66	4.62	1.28	-
	5	É normal pensar em qual será o meu trabalho daqui a			.76	.59	4.95	1.28	-

Note. Factor loadings lower than .30 were excluded from presentation.

#### 1.4.1.2 Discussion

The aim of this study was to explore TEIC factor structure through an EFA. The obtained results are very positive; a three factor structure was verified, with elevated factor loadings, high communalities, and no cross-loadings in other factors.

The TEIC was constructed considering two dimensions, the Past Temporal Extension and the Future Temporal Extension, with six items forming each dimension. In each dimension should exist two items related with work issues, two items associated with relational themes and two items with a more general approach to Temporal Extension. The data revealed the emergence of the Future Work Temporal Extension as an independent factor which can be seen as a positive aspect of the results, since it confirms the existence of a new and unique aspect of the Temporal Extension. By the other side, it has some psychometric pitfalls as it difficult the interpretation of the individual's scores and prevents a high internal consistency of the subscale, due the low amount of items. Nevertheless, the two other factors exhibit a good internal consistency.

The choice of an oblique rotation seems also correct due to the existent correlations between the components as can be confirmed in Table 17 (Field, 2013; Pestana & Gageiro, 2008). As expected the items nº 4 and nº 11 did not contribute to the TEIC factor structure, since they're designed with other intent.



## 1.4.2 Study 2: TEIC CFA

### 1.4.2.1 Results

With the intent of assessing the fit quality of the collected data to the TEIC model achieved through EFA, a CFA using structural equation modeling with maximum likelihood estimation was carried out. All the variables presented a normal univariate distribution ( $sk < 3$ ;  $ku < 10$ ). Yet, the multivariate normal distribution was not achieved ( $ku = 18.68$ ).

The initial model to be tested is formed by two latent variables (Future and Past Temporal Extension) as represented in Figure 15. This model presents almost acceptable overall fit indices in most cases (CFI = .87, NFI = .83) and acceptable in other cases (GFI = .92). More information about this model fit indices can be found in Table 19.

The item analysis reveals two items with inadequate results. In fact, items nº 2 and nº 5 are presenting low and non-significant factor loadings ( $\beta = .12$ ,  $p > .05$  and  $\beta = .18$ ,  $p > .05$  respectively) as well as a low amount of item variance explained by the factor ( $R^2 = .01$  and  $R^2 = .03$ ). Also, a particularly high value on modification index between these two items (MI = 21.27) suggest the possibility that they should be grouped as being part of an independent latent component.

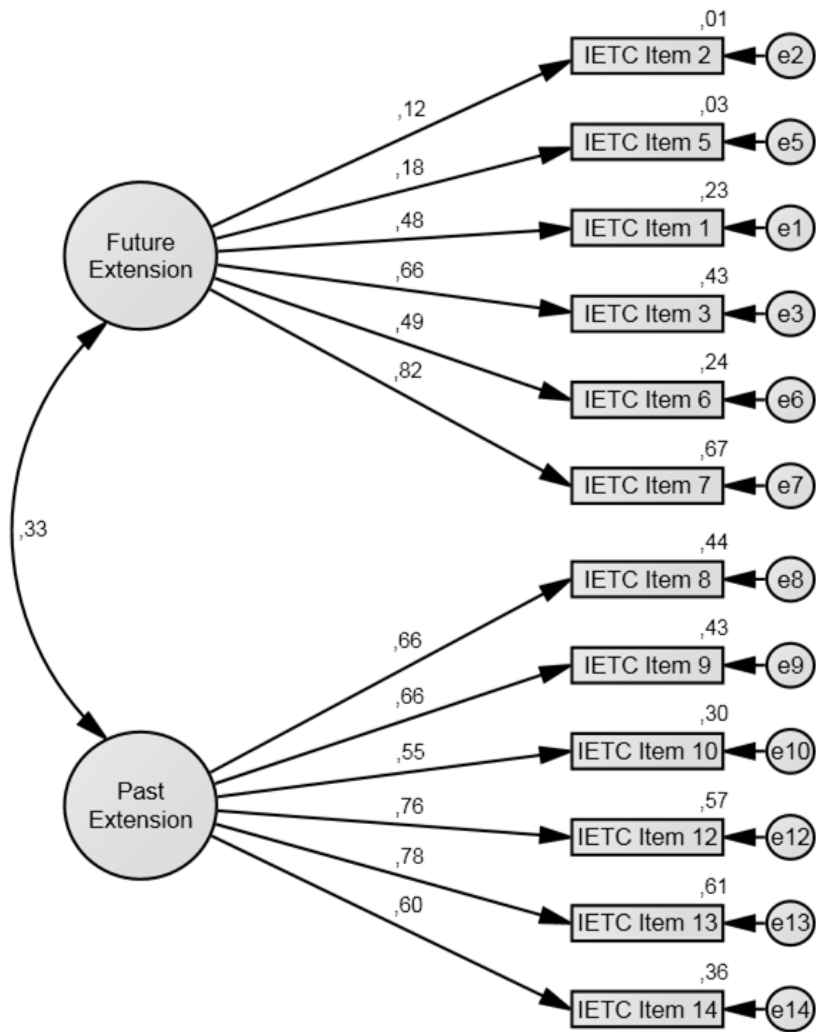


Figure 15. TEIC Model 1 Path Diagram (Standardized Estimates)

Considering those results we've designed a second model to be tested (Model 2), containing three latent variables related with the Past, Future and Work Future Temporal Extensions (see Figure 16) as verified in the previously presented EFA (consult Table 18). Regarding the overall model fit indices, some present almost acceptable adjustment values (CFI = .89, NFI = .85), while others

showed acceptable adjustment values ( $\chi^2/df = 3.37$ , GFI = .93), more information available in Table 19.

The two items that presented poor psychometric performance in the former model (Item 2 and 5) are now showing better results but still not acceptable regarding item 2, which failed to achieve the  $\lambda \geq .50$  and  $R^2 \geq .25$  values recommended for this type of analysis (Marôco, 2010).

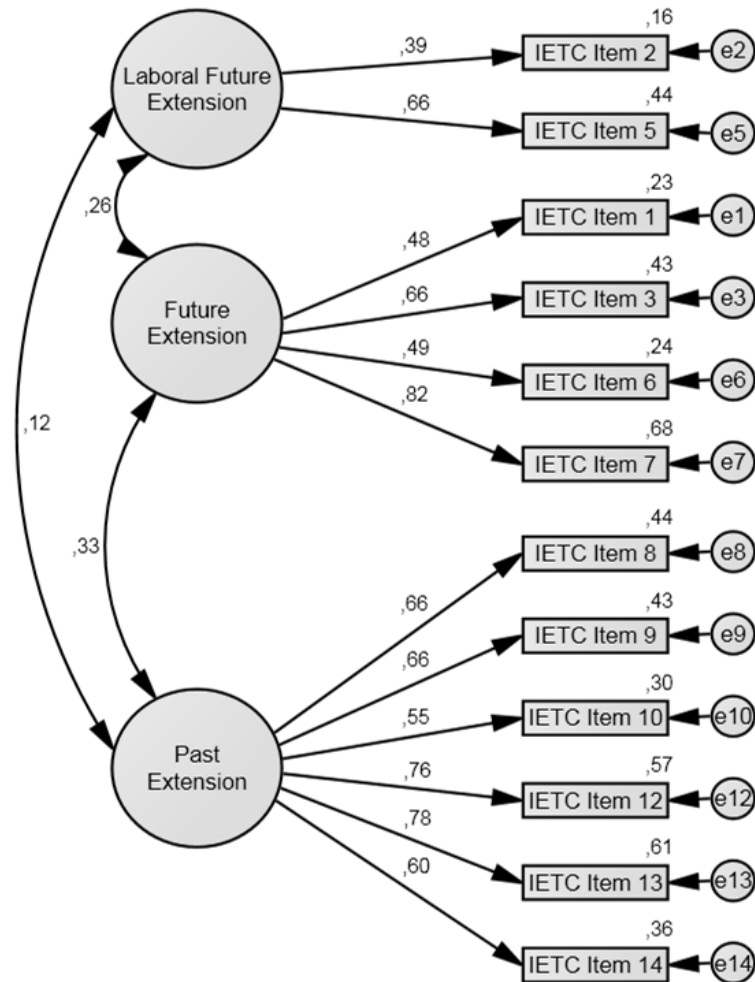


Figure 16. TEIC Model 2 Path Diagram (Standardized Estimates)

Since the model fit indices are not at an optimal level we decided to test other models. Also, in our theoretical view of the Temporal Extension concept, the Laboral/Work Future Extension should be represented as a sub-dimension of Future Extension, which is probably manifest due to the moderate correlation between these two dimensions ( $r = .26$ ). As such, in Model 3 (see Figure 17) the items are grouped according to the same three latent variables from Model 2 with the difference that the Future Extension component is organized as a 2<sup>nd</sup> order component regarding Labor/Work Future Extension. Also, according to the modification indices, we've fixed an association between the items 8-9 and 10-14, which have resulted in two moderate and highly significant correlations ( $r = .31$ ,  $p < .001$  and  $r = .36$ ,  $p < .001$  respectively).

Both main components (Future Extension and Past Extension) showed a moderate and statistically significant correlation ( $r = .32$ ,  $p < .001$ ). The effect of the 2<sup>nd</sup> order component (Future Extension) on the Labor/Work Future Extension component is small but almost significant ( $\lambda = .27$ ,  $p = .07$ ) and explains a small amount of variance of it ( $R^2 = .07$ ). All the items achieved  $\lambda \geq .50$  and  $R^2 \geq .25$  values as recommended by Marôco (2010) for this type of statistical analysis, with the exception of item 2, which still presented its better results in this model.

Regarding the indirect effect of Future Extension on Labor/Work Future Items we've found a small effect as much as in item 2 ( $\beta = .11$ ) as in item 5 ( $\beta = .17$ ). All three models overall and comparative fit indices are shown in Table 19.

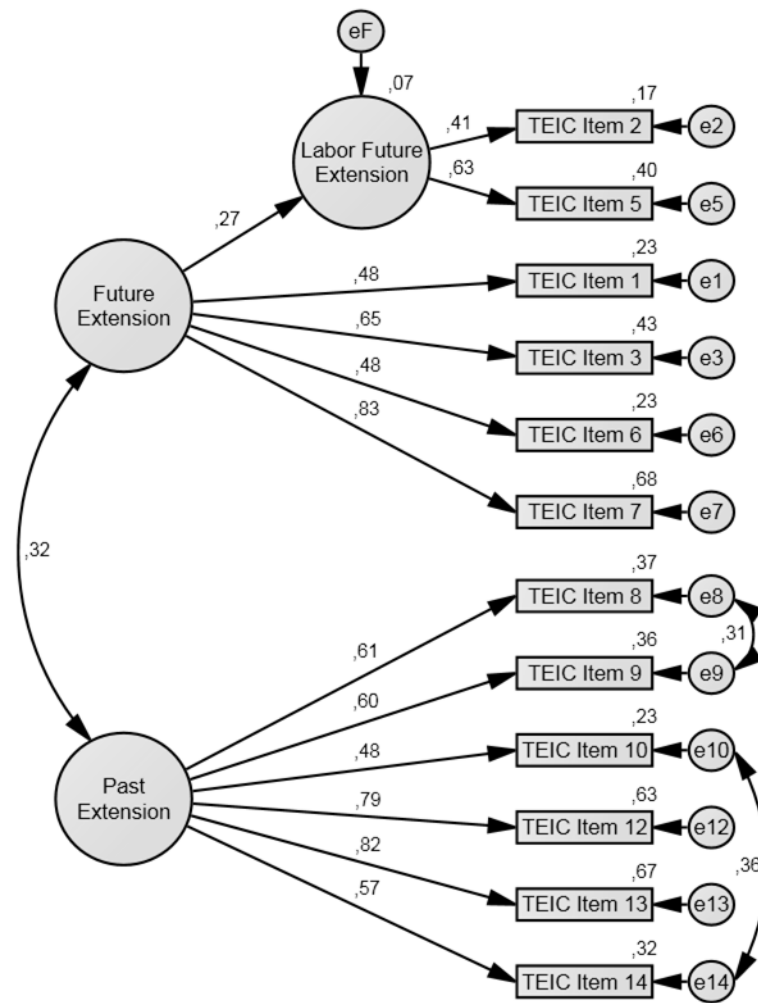


Figure 17. TEIC Model 3 Path Diagram (Standardized Estimates)

**Table 19.**  
TEIC Fit Indices and Model Comparison

	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	$\chi^2/df$	AIC	MECVI	CFI	PCFI	GFI	PGFI	NFI	RMSEA
Model 1	193.80	53	-	-	3.66	243.80	.70	.87	.70	.92	.62	.83	.09
Model 2	171.65	51	22.15	2	3.37	225.65	.65	.89	.69	.93	.61	.85	.08
Model 3	104.72	50	89.08	3	2.09	160.72	.46	.95	.72	.95	.61	.91	.06

Note.  $\Delta\chi^2$  compared with the original two factor model.

Considering the results showed in Table 19, we consider that Model 3 presents the best adjustment to the data. This model presented amongst the studied models, the lowest value in the Akaike's Information Criterion (AIC = 160.72) as well in the Modified Expected Cross-Validation Index (MECVI = .46). Also, the differences in the  $\chi^2$  estimate compared with the initial Model 1 were statistically significant ( $\Delta\chi^2_{Model\ 3-Model\ 1} = 89.08, p < .001$ ).

#### 1.4.2.2 Discussion

The present study examined the formerly proposed (Study 1) factor structure of the Temporal Extension Inventory of Coimbra – TEIC. Several CFA models were tested out, being the Model 3, composed by three latent variables: Future Extension, Past Extension and Labor/Work Future Extension the best model tested. The Future Extension was designed as a 2<sup>nd</sup> order component regarding Labor/Work Future Extension. The overall fit of the model was satisfactory as the items reliability.

As expected the two main components (Future and Past Extensions) were moderately correlated. We believe that the cognitive processes of thinking too far away either for the future or the past can be in someway alike. The contrary can be also truth, for example clinical cases of Post-Traumatic Stress, in which patients found difficult to remember events past away due to some traumatic event, may also found difficult to think too far away in the future, to plan a

future career or a marriage. Still, this possible association between the concept of Temporal Extension and clinical profiles should be empirically tested.

### 1.4.3 Study 3: TEIC Group Differences & Correlations

#### 1.4.3.1 Results

In order to explore possible gender differences in Temporal Extension, an independent-sample t test was carried out. Statistical significant differences were found between genders, regarding Past Temporal Extension  $t(194) = 2.01, p < .05$ , with the male gender presenting the highest values ( $M_{Male} = 18.99, SD_{Male} = 6.93$  vs.  $M_{Female} = 16.85, SD_{Female} = 5.80$ ). In Future Temporal Extension, no significant differences were found  $t(194) = -1.23, p = .22$ , still the female gender presented the most highest values in this temporal dimension ( $M_{Female} = 22.24, SD_{Female} = 5.14$  vs.  $M_{Male} = 21.11, SD_{Male} = 4.94$ ).

In the correlational framework, TEIC presented moderated and statistical significant correlations with several Time Perspective dimensions. Concerning Future Temporal Extension, the correlations were with the Future Consequences ( $r = .18, p < .05$ ) and Immediate Consequences ( $r = .17, p < .05$ ) subscales, from the Consideration of Future Consequences Scale – CFC (Strathman, Gleicher, Böniger, & Edwards, 1994) and also with the Present Fatalist ( $r = -.22, p < .05$ ) subscale from the Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd,

1999). Regarding Past Temporal Extension, the most important correlations were with the CFC subscales, Future Consequences ( $r = .24, p < .01$ ) and Immediate Consequences ( $r = .14, p < .05$ ). Also, it's important to consider of the existence of a moderate and significant correlation between both Past and Future Temporal Extensions ( $r = .26, p < .01$ ).

#### *1.4.3.2 Discussion*

We consider that the TEIC has considerable potential to be used as a measure able of detecting differences among genders. Still, the lack of statistical significance when analyzing the differences in the Future Temporal Extension can be related with the low heterogeneity of the collected sample. Because in the specialized literature is common to find results in which the female gender is more oriented to the temporal dimensions related with the Future (Zimbardo & Boyd, 1999).



## Chapter 2

### *Time Perspective and its Association with other Temporal Variables*

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The intent with this chapter is to present all the statistical analysis performed in order to explore the association between Time Perspective and other temporal dimensions in a Portuguese context. As so, the first step is addressed in Sub-chapter 2.1 A New Multidimensional Model of Time Perspective, which is an evaluation of the structural model of Time Perspective formed by seven temporal dimensions. This analysis is accomplished through a Structural Equation Modeling – SEM.

The second step is addressed in Sub-chapter 2.2 The relation between Time Perspective and Temporal Extension, concerning the relation of the above mentioned model with a different temporal dimension, Temporal Extension, this is achieved also through the use of SEM.

After this, the next phase consists in exploring and assessing the quality of the relations between the Time Perspective model and other psychological constructs such as Hope (see 3.7 The Relation Between Time Perspective and Hope) and Sensation Seeking (see 3.9 The Relation Between Time Perspective and Sensation Seeking).

## 2.1 A New Multidimensional Model of Time Perspective

### 2.1.1 Results

Following the idea of the need of inclusion of a negative dimension concerning the individual's future thinking and also the proposal of Zimbardo & Boyd (2008) for a sixth ZTPI dimension (the Transcendental Future), we have decided to test via Structural Equation Modelling a Time Perspective model composed of seven temporal dimensions, which follows the proposal of Ortuño, Paixão, Janeiro & Gomes (2013). Compared with the previous work some improvements have been made. First, several items of ZTPI and TFTPS were removed, in view of the results obtained and presented in the previous chapters regarding those two tools. Second, the correlation between two TFTPS items residuals was removed due to the lack of a significant association ( $r_{\text{etf01-etf03}} = .16$ ,  $p = .151$ ). Third, the regressional path  $\beta_{\text{PastPositive-Item34}} = -.07$ ,  $p = .35$ , which was proposed in the ZTPI Confirmatory Factor Analysis was removed due its lack of statistical significance as well a lack of intensity in the association. Fourth and last, eight correlational paths between the temporal dimensions were removed due to a non-significant result ( $p > .05$ ), these are:

- Past Positive <-> Past Negative
- Present Hedonist <-> Future
- Present Fatalist <-> Past Positive
- Future <-> Past Positive

- Future <-> Past Negative
- Future <-> Present Fatalist
- Future Negative <-> Past Positive
- Transcendental Future <-> Future Negative

The model global fit indices are close to an acceptable level in some indices (CFI = .88), while in others (for example parsimony indices) the results are acceptable (PCFI = .79); a full report regarding the fit indices, as well the path diagram of this model can be found in Figure 18.

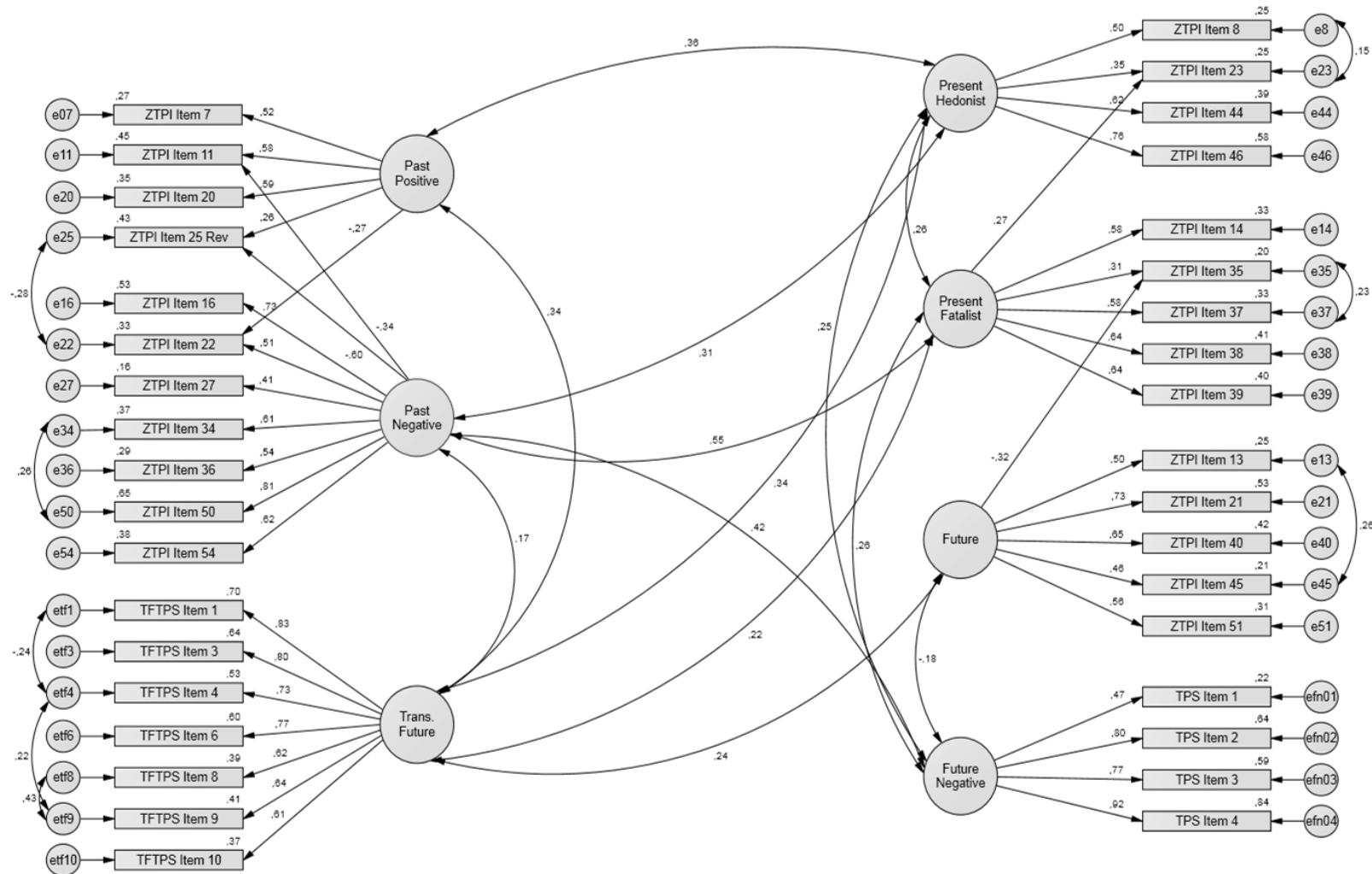


Figure 18. 7-Dimensions Time Perspective Model Path Diagram

Note. The global fit indices of the model were the following:  $\chi^2(568) = 895.30, p < .001; \chi^2/df = 1.58; CFI = .88, PCFI = .79; GFI = .82; PGFI = .70; NFI = .73; RMSEA = .05, p = .31; AIC = 1091.30; MECVI = 5.29.$

As previously presented for each one of the inventories and corresponding variables that are included in this model, all items present a statically significant association with their theoretical factor; also the presented correlations between factors present a significant  $p$ -value ( $p < .05$ ). All the items present good reliability and good factor loadings. With the exception of the TFTPS etf01 <-> etf03 residuals correlation, we chose to maintain all the previously proposed correlations between item residuals due to their statistical significance ( $p < .05$ ).

Then we proceeded to the analysis of the results of an Exploratory Factor Analysis which we carried out with this exact same model, we found that it explains 56.20% of the total variance. The KMO index was .782.

### *2.1.2 Discussion*

The aim of this study was to test via a robust statistical technique (Structural Equation Modelling) the validity and reliability of a model comprising seven time zones; this model is formed by the original five dimensions proposed by Zimbardo & Boyd (1999) and validated internationally in more than 30 countries, and the Transcendental Future proposed by Boyd & Zimbardo (1997). These six dimensions are already referred to as a joint model by Zimbardo & Boyd (2008).

However, considering the original definition of Time Perspective proposed by Lewin (1965), as well as to other authors' considerations about the influence of a negative vision of the future on the individual's psychological and behavioural space (Zaleski, 1996) we have decided to include one more dimension, the Future Negative, which was assessed through the Future Negative/Future Anxious sub-dimension of the Time Perspective Scales (Janeiro, 2012).

The Time Perspective theoretical and statistical model proposed in this chapter can be considered as an improvement to the 69-item model proposed by Ortuño, Paixão, Janeiro & Gomes (2013), as it uses less items and has more total variance explained; in fact, this model presents high reliabilities ( $R^2 < .25$ ) as well as high factor loadings ( $\beta > .50$ ) in practically all items. Considering these results we would like to recommend this model as a step forward in the study of Time Perspective. We believe that the addition of the Negative Future dimension in this multi-dimensional model brings an important contribution to the study of psychopathologies, self-esteem (Ortuño et al., 2013a; Ortuño & Vasquez, 2013) and other psychological dimensions relevant to the comprehension of both-well and ill-being.

Globally, the changes introduced in the model resulted in a more consistent and reliable model, and as such the proposal for a new Time Perspective model is formed by 36 items and 7 temporal dimensions (five from the ZTPI, one from the TFTPS and one from the TPS).

Almost all the reported associations between the seven temporal dimensions are according to what was expected if we take into account the literature previously analysed about this topic. The Past Positive presents a positive relation with the Present Hedonist (Zimbardo & Boyd, 1999). On the other hand, the Past Negative is positively correlated with the Present Hedonist and Present Fatalist and the Present Hedonist is positively correlated with Present Fatalist (Zimbardo & Boyd, 1999). The Transcendental Future is positively correlated with the Past Positive, Past Negative, Present Fatalist, Present Hedonist and Future as also reported by Boyd & Zimbardo (1997). Regarding the Future Negative, its correlational pattern was also according to previous results in some aspects (positive with Past Negative and Present Fatalist), but the other two correlations were not expected (negative with Future and positive with Present Hedonist), since its contrary to the results of Carelli et al. (2011). The lack of statistical significance on some of the relations among the temporal dimensions may be related to the characteristics of the sample, which presents little heterogeneity, since almost all participants are college students.

Still, there is one relation between two temporal dimensions that had not been tested in previous studies until now: we are referring to the Transcendental-Future <-> Future Negative path. Conceptually, we consider those two dimensions to be different; the Future Negative is more than a temporal orientation, as the concept possesses also an affective valence towards the future (or Temporal Valence/Affectivity), which in this case is negative, while the Transcendental Future does not possess any emotional valence (not positive

nor negative) toward that specific temporal frame (the future after the death of the physical body). In an indirect way we can argue that Transcendental Future is not associated with any kind of Temporal Valence (positive or negative) since it did not present differences in its association with dimensions that have a clear positive or negative affective valence attached to it, such as for example Past Positive and Past Negative (see Table 8). Yet, the best option to test this assumption would be to use a scale or inventory that measures Temporal Valence together with the TFTPS or to develop a set of items to measure this temporal dimension. Another cause for the lack of association between Transcendental Future and Negative Future could be related to the characteristics of the future frame that is being assessed by these two temporal dimensions: on one side we have Transcendental Future which is related to a transcendent or even mystical possible future, while on the other side we have Future Negative, which is related to daily activities, goals, aspirations and fears towards an “ordinary” or mundane (in Zimbardo & Boyd’s words, 2008) future. We believe that these two arguments explain the lack of association between Transcendental Future and Future Negative.

The model did not present an expressive statistically significant relationship between those two dimensions ( $r_{TranscendentalFuture-FutureNegative} = -.07, p = .329$ ) either, and this is the reason why it was removed from the path diagram, along with a few other relationships in order to achieve a more robust model. This decision was based purely on statistical considerations, since the conceptual



basis of this model, which follows Zimbardo & Boyd's (1999) ideas, implies that all the temporal dimensions are related.

Beyond its structural and conceptual validity, the 7-dimension model also presents a considerable amount of total variance explained. In future studies it will be necessary to test its predictive power. Since it results from an association between different temporal dimensions we believe that this model, or at least part of it, will be connected with a wide array of behaviours and cognitions, such as previous studies have recognized while studying a selection of these same dimensions (Carelli et al., 2011; Keough et al., 1999; Ortuño & Vasquez, 2013).

## **2.2 The relation between Time Perspective and Temporal Extension**

### *2.2.1 Results*

After defining the structural model for both the Temporal Extension (see section 1.4.2 from the previous Chapter) and the 7-dimension Time Perspective model (see section 2.1.1 from this Chapter), we decided to explore the nature of the relation of those temporal constructs. The chosen technique to explore this possible association was Structural Equation Modelling – SEM.

The first model that was tested represents a correlational association between the seven the Time Perspectives (Past Positive, Past Negative, Present Hedonist, Present Fatalist, Future, Future Negative and Transcendental Future) and the Temporal Extension. This model failed to achieve acceptable global fit indices (CFI = .85, GFI = .78, NFI = .66). Neither Temporal Extensions (Past and Future) presented moderate/high and significant correlations with the other 7 Time Perspectives, the only exception being the positive correlation between Future Temporal Extension and Transcendental Future ( $r = .29, p < .01$ ); these and the other correlations can be found in Table 20.

**Table 20.**  
*Correlations of Future and Past Temporal Extensions with seven Time Perspectives*

	Future Temporal Extension		Past Temporal Extension	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Past Positive – ZTPI	.18	.15	.19	.07
Past Negative – ZTPI	-.10	.31	.13	.11
Present Hedonist – ZTPI	.04	.71	-.03	.77
Present Fatalist – ZTPI	-.20	.09	.07	.43
Future – ZTPI	.11	.31	.06	.50
Future Negative – TPS	-.09	.36	.12	.13
Transcendental Future – TFTPS	.29	.01	.07	.38

The following premise that was tested is that Time Perspective has predictive power over the construct of Temporal Extension, an idea which emerged from the theoretical considerations of several authors about Temporal Extension, which is always idealized as a dimension of Time Perspective (Husman & Lens, 1999; Lennings, 1994; Nuttin & Lens, 1985; Peetsma, 2000). This type of relation in a Structural Equation Modelling framework can be represented as a regression model with second-order latent dimensions. As such, the seven Time Perspectives were introduced as predictors of both Temporal Extension dimensions. Regarding its overall quality, the model did not present acceptable values in the global fit indices (CFI = .85, GFI = .78, NFI = .66). Most of the predictor variables did not present moderate/high associations with the Temporal Extension. Concerning Future Temporal Extension, Transcendental Future Time Perspective presented a moderate predictive association ( $\beta = .33, p < .01$ ) as well as Present Fatalist Time Perspective ( $\beta = -.27, p = .09$ ), yet only TFTP presented a statistically significant result. Concerning Past Temporal Extension, Past Positive Time Perspective presented a moderate predictive association ( $\beta = .26, p < .05$ ) as well as Present Hedonist Time Perspective ( $\beta = -.20, p < .10$ ), but only the former presented a statistically significant result; a summary of this regression analysis can be found in Table 21.

**Table 21.**  
*Summary of Regression Analysis of Time Perspective Predicting Temporal Extension*

	Future Temporal Extension				Past Temporal Extension			
	B	SE B	$\beta$	$p$	B	SE B	$\beta$	$p$
Past Positive	3.94	6.96	.08	.57	<b>11.58</b>	<b>5.53</b>	<b>.26</b>	<b>.04</b>
Past Negative	.30	4.58	.01	.95	3.99	3.48	.13	.25
Present Hedonist	-1.86	7.13	-.03	.79	-9.54	5.73	-.20	.10
Present Fatalist	-11.82	7.06	-.27	.09	.52	4.44	.01	.91
Future	1.79	6.50	.03	.78	4.14	4.80	.08	.39
Future Negative	-.12	3.40	-.004	.97	3.63	2.68	.13	.18
Transcendental Future	<b>7.77</b>	<b>3.09</b>	<b>.33</b>	<b>.01</b>	.08	1.98	.004	.97
$R^2$	.17				.09			

*Note.* Statistically significant associations are marked in bold.

### 2.2.2 Discussion

The aim of the present study was to define the nature of the relations between Time Perspective and Temporal Extension, since the latter is defined by several authors as a dimension of Time Perspective (Nuttin & Lens, 1985; Peetsma, 2000); based on this assumption, the expected result was that the dimensions of Time Perspective would be strong predictors of temporal extension. Yet, neither the correlational nor the regression models created to recreate these possible conceptual relations presented an acceptable global model fit. But not only at the global level did the models present statistical weaknesses. Analysing the models at a more analytic level, it is possible to ascertain that both the intensity as well the statistical significance of the relation among the latent dimensions were not satisfactory.

The correlational model presented a weak global adjustment to the data (CFI = .85, GFI = .78, NFI = .66), and there were also no strong or significant relations between the temporal dimensions. Regarding the possible associations between the seven Time Perspectives and the Future and Past Temporal Extensions only the Future Temporal Extension <-> Transcendental Future path presented a significant correlation between the two latent constructs.

Due the lack of correlational association between Time Perspective and Temporal Extension and the conceptual nature of Temporal Extension, which is presented as a dimension of Time Perspective, a model was tested with the Time Perspective dimensions as predictors of temporal extension. This model did not

present acceptable global fit indices (CFI = .85, GFI = .78, NFI = .66) and unexpectedly, it was not validated. The only Time Perspective predictors with statistical significance were Transcendental Future towards Future Extension and Past Positive towards Past Extension.

Future Temporal Extension presented an association with the Transcendental Future in all the models. We believe that the basis for this association is related to the individual's temporal horizon, since the Transcendental Future is the Time Perspective that represents the most remote of all the temporal dimensions, meaning that chronologically the motivational objects that are the most distant from the present moment are those allocated in the Transcendental Future Time Perspective. As such, individuals who focus on a temporal frame that is located at least 50 years ahead of the present moment (considering that the collected sample is composed mostly of college students) are clearly those with a wider Temporal Extension. The psychological foundation for this extended and transcendental thinking is related to S. Freud's ideas about conscious and unconscious thinking about death. Freud (1962) argues that individuals, even when consciously thinking about their own death, are convinced at an unconscious level of their own survival, their own immortality. This would allow individuals to project themselves into an unknown but almost certain future (at least in the unconscious understanding) that occurs after the death of the physical body.

Regarding the Past Temporal Extension, only Past Positive Time Perspective presented a significant and positive association. This evidence leads us to suggest that a positive view about one's own past is an important influence in how far back the individuals project their thinking about events that have already happened. Thereby it appears that the more the individuals think about their past in a positive way, the more this same process reinforces and improves itself, allowing the individual to travel progressively farther into their own past.

Reflecting upon these results, which we consider as inconclusive, and even though several authors indicate the Temporal Extension as a Time Perspective dimension (Husman & Lens, 1999; Lennings, 1994; Nuttin & Lens, 1985; Peetsma, 2000), we recommend that in future studies Time Perspective and the Temporal Extension should be treated (at least from an operational point of view) as two different and separated constructs. More evidence needs to be gathered in order to discover the real conceptual and empirical relations between these two temporal dimensions, mainly by designing longitudinal studies in which it will be possible to observe the chronological evolution of those concepts. Researchers could also use group analysis, considering individuals with high and low temporal extensions and how each of these groups correlates with the Time Perspective dimensions. Finally, experimental studies manipulating the participants' temporal extension might catch a glimpse of how Temporal Extension can affect Time Perspective.

## 2.3 The relation between Time Perspective and Hope

### 2.3.1 Results

In order to assess the type of relations which exist between Time Perspective and the concept of Hope, we developed a model which proposes relations between these psychological constructs. The measurement sub-model is composed, as far as the time perspective concept is concerned, by the previously proposed model (see section 2.1.1 from this Chapter), while regarding the concept of hope it includes all the Adult Hope Scales – AHS items, which are manifest in two latent components (Agency and Pathways). Only the items Nos. 3, 5, 7 and 11 were excluded from the analysis since they were created as distractors, not intended to be considered in Hope's score or its sub-dimension scores. The defined structural sub-model proposes Time Perspective as a predictor of Hope. The complete path diagram can be found in the Figure 19.

The global model did not present acceptable fit indices (CFI = .85, GFI = .79, NFI = .70). Still, the amount of explained variance in the two dependent variables (Agency and Pathways) was considerable ( $R^2 = .43$ ,  $R^2 = .27$ , respectively).



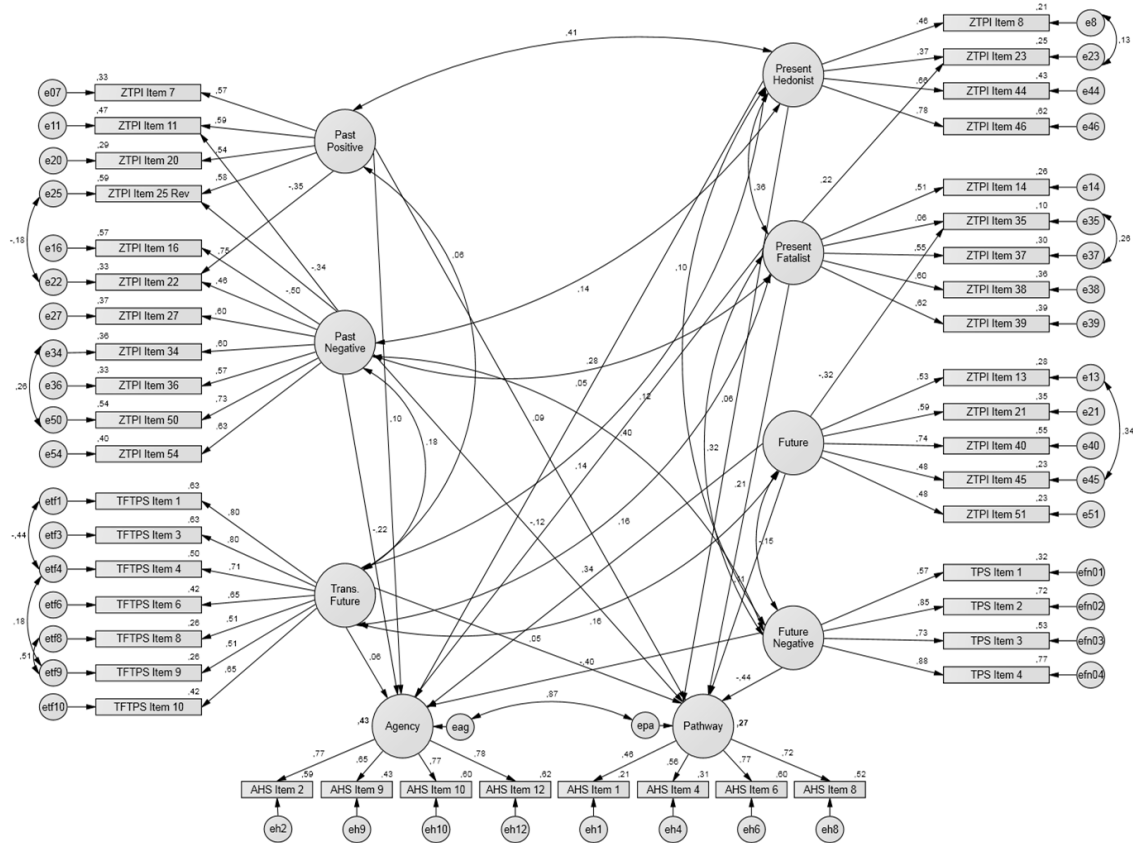


Figure 19. Path Diagram of the Proposed Model of the Regression Analysis of the Concept of Hope (Model 1)

Several endogenous variables (Past Positive, Present Hedonist and Transcendental Future) did not present a significant association ( $p > .05$ ) with the exogenous variables (Hope dimensions); as such they were eliminated and a new model was put into testing to ascertain its fit to the data. This new model (Model 2) presented slightly better results in the fit indices (CFI = .89, GFI = .85, NFI = .77); its complete path diagram can be found in Figure 20. The loss of explained variance following the elimination of three endogenous variables was not substantial regarding both Agency (Model 1  $R^2 = .43$  vs. Model 2  $R^2 = .38$ ) and Pathways (Model 1  $R^2 = .27$  vs. Model 2  $R^2 = .24$ ).

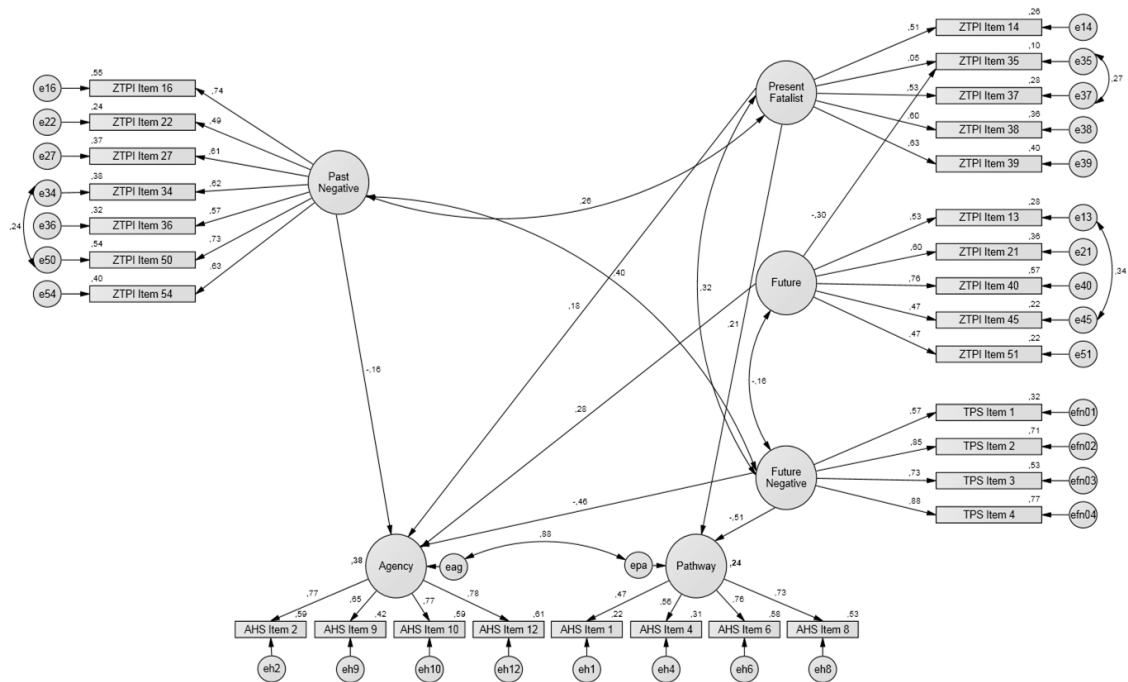


Figure 20. Path Diagram of the Corrected Model of the Regression Analysis of the Concept of Hope (Model 2)

### 2.3.2 Discussion

The aim of this study was to test the predictive power of a previously defined Time Perspective model on a time-related concept such as Hope or more specifically, its two dimensions Agency and Pathways according with Snyder et al.'s (1991) conceptual proposal. The Time Perspective model did not present clearly acceptable fit indices, which were near an acceptable point in some aspects (CFI and GFI) or acceptable in others ( $\chi^2/df$  and RMSEA).

Four temporal dimensions were significantly associated with Hope; in the case of Agency the significant predictors were Past Negative, Present Fatalist,

Future and Future Negative; only Past Negative and Future Negative presented a negative association with Hope, which seems logical, considering that an orientation towards Past Negative Time Perspective can be synonymous with a focus on past failures and frustrations and that Future Negative Time Perspective-oriented individuals can be focused on the fear or anxiety of future failures; both negative visions can easily undermine the perception of success that characterizes Agency thinking. The Future had a positive association with Agency, which is also expected due to the fact that using the future zone is highly related to plan-making and goal pursuit. These results are similar to those encountered by Ortuño, Gomes, Paixão & Janeiro (2013, June). Still, Present Fatalist presented a positive association with Agency thinking, which does not appear to be a logical association, since Present Fatalist usually is related to feelings of hopelessness and an external locus of control (Zimbardo & Boyd, 1999), characteristics that are opposed to the hopeful Agency thinking. Ortuño, et al. (2013, June) similar to our results, also did not find an association between Present Fatalist and Agency. Phan (2009), however, did find a positive association between Present thinking and Agency, although its measure of Present is more related to hedonistic thinking about the present than fatalistic thinking. As such, it appears that Present thinking has an influence on Agency; however, the nature of its impact has yet to be discovered.

Regarding Pathway predictors, only two of the original seven Time Perspectives presented a statistical significant association with it. Those were Present Fatalist and Future Negative; the former presented a positive and

moderate association with Pathways thinking, in the same way as Agency thinking. We believe that these results do not conform to the conceptual conception of Pathway thinking, which is deeply related with a sense of being able to generate the necessary plans or solutions in order to successfully overcome any difficulty and achieve valued goals (Snyder et al., 1991). Yet Future Negative did present a negative association with Pathways, which is concordant with the conceptual basis of both dimensions. In this specific case we believe that the fear of possible future failures can harm the individual's positive belief in his/her ability to overcome any future difficulties, since he/she is focusing on the aspect that can go wrong instead of focusing on the elaboration of strategies to deal with the obstacles; the sense of self-efficacy is probably also undermined due to this biased view of the future. Very similar results were also reported by Ortuño et al. (2013, June), while Phan (2009) did not study the negative component of the future in his study on Hope. Transcendental Future as a predictor of Agency and Pathways did not present any significant results, a tendency also reported by Ortuño et al. (2013, June). Even with the transcendental connotation that the concept of Hope has, empirically it seems to be more related to the "mundane" future.

Concerning the predictive power of Time Perspective in relation to the concept of Hope, the model reported a moderate amount of explained variance, 38% regarding Agency thinking and 24% regarding Pathway thinking. This result is similar to that reported by Ortuño et al. (2013, June), yet these authors reported a higher quantity of explained variance in both dimensions of Hope

and we believe that the tailor-made approach in that work allowed them to achieve a slightly better model to study the concept of Hope than the present model. Still, our intent with this study was to test the predictive power of the Time Perspective model as presented in Sub-chapter 2.1 A New Multidimensional Model of Time Perspective.

This study also allowed us to test the idea that hopeful thinking as a cognitive process is related not only to the psychological future dimensions, but also with the entire temporal horizon including dimensions related to the past and the present temporal frames. In other words, we believe that Agency thinking represents a sense of successful determination in meeting goals and Pathway thinking represents a sense of being able to generate successful plans to meet goals and that both are partially driven by the individual's previous notions about his/her own past, present and future, which seem to be interplaying through a specific role in the creation and development of hopeful thinking. In the last specific case, we believe that individual's beliefs regarding achieved goals and other successes can reinforce or even function as an example of how the individual had generated plans and met goals in previous situations. The present temporal frame would provide the emotional stability necessary to overcome obstacles. Regarding the future, we believe that it allocates the necessary cognitive resources to successfully develop and carry out plans.

Although we have approached the two main components of Hope, Snyder et al. (2002) also consider the individual's goals as an important component of

the concept of Hope. Future studies must also include this component, which could be strongly related with the individual's Temporal Density.

## **2.4 The relation between Time Perspective and Consideration of the Future Consequences**

### *2.4.1 Results*

In order to assess Time Perspective as a plausible predictor of the concept of Consideration of Future Consequences we developed a model which proposed the structural relation between those psychological constructs. The measurement sub-model concerning Time Perspective is composed of the model proposed in Sub-chapter 2.1 A New Multidimensional Model of Time Perspective, while in relation to Consideration of Future Consequences it includes all the items of the Consideration of Future Consequences Scale – CFCS; these items are manifest in two latent components (Future and Immediate). In the empirical study we carried out item No. 5 was excluded from the analysis due its low reliability and factor loading, following the recommendation of Vásquez et al. (in press). The defined structural sub-model proposes Time Perspective as a predictor of the Consideration of Future Consequences. The complete path diagram can be found in Figure 21.

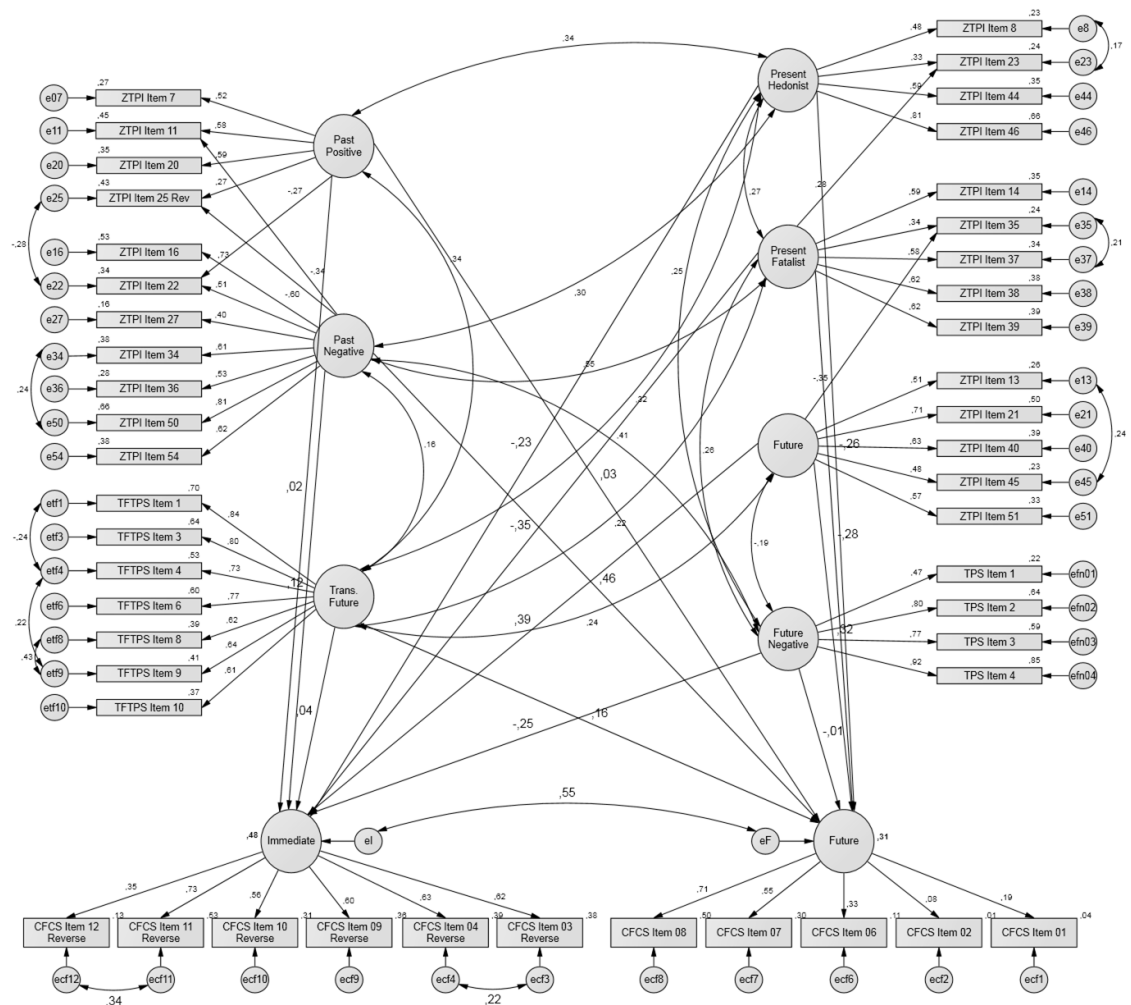


Figure 21. Path Diagram of the Proposed Model of the Regression Analysis of the Concept of Consideration of Future Consequences (Model 1)

Model 1 presented a good amount of variance explained for both Future ( $R^2 = .31$ ) and Immediate ( $R^2 = .48$ ) dimensions. The global fit of the model was near the acceptable values in various fit indices (CFI = .86) and acceptable in others (PCFI = .79, PGFI = .69, RMSEA = .05). Still, three of the endogenous variables (Past Positive, Past Negative and Transcendental Future) did not

present a statistical significant association with both the two exogenous variables and as such they were eliminated in order to test a new predictive model, which we expected would present better fit without losing much predictive power. In this new model also the regressional paths of Present Hedonist, Present Fatalist, Future and Future Negative as predictors of Future (CFCS) were removed due a lack of statistical significance ( $p > .05$ ); thus, all the effects of Time Perspective on the CFCS Future dimension would be indirect and mediated by the Immediate CFCS dimension.

The complete path diagram of the new model (Model 2) can be found in Figure 22. The model presented improvements regarding the global fit indices when compared with the previous model (CFI = .86, GFI = .84, RMSEA = .05) as almost all reach an acceptable level. All the trajectories regarding regression weights and covariances are statistically significant ( $p < .05$ ). The explained variance of the two CFCS dimensions remains considerable: Future ( $R^2 = .28$ ), Immediate ( $R^2 = .45$ ). The trajectories of Present Hedonist, Present Fatalist and Future Negative towards Immediate (CFCS) were all negative, while the Future trajectory toward the same dimension is positive. The Immediate dimension presented a highly significant direct effect on Future (.53,  $p < .01$ ), while all the four Time Perspective dimensions in the model presented significant indirect effects on Future ( $p < .05$ ). The direct and indirect effect significance was analysed through the resampling method of Bootstrapping; these effects are presented in Table 23 along with their lower and upper bounds and respective statistical significance.



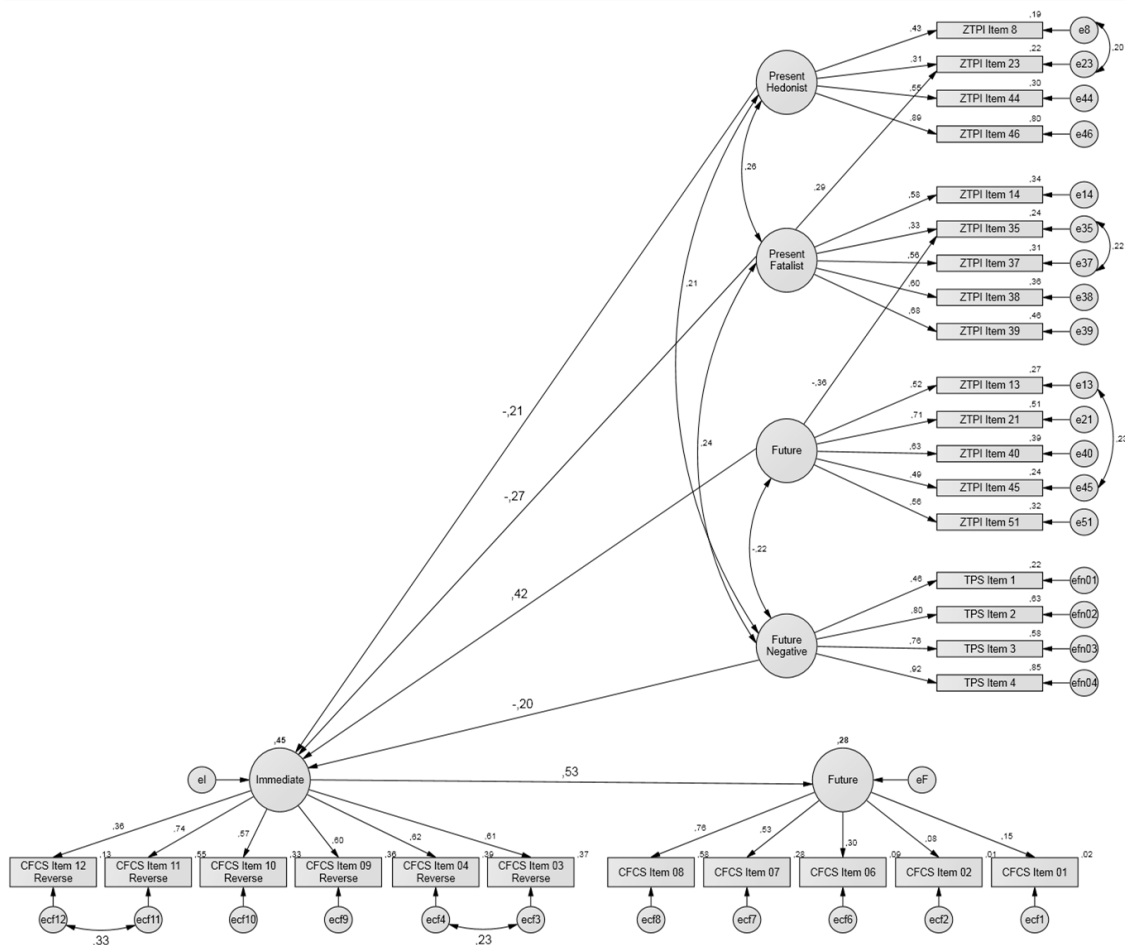


Figure 22. Path Diagram of the Model of the Regression Analysis of the Concept of Consideration of Future Consequences (Model 2)

**Table 22.**  
*Standardized Direct and Indirect Effects of the Consideration of Future Consequences Mediation Model*

Independent Variable	Dependent Variable	Direct Effect	Indirect Effect	Lower Bound	Upper Bound	<i>p</i>
Present Hedonist	Immediate	-.21		-.34	-.04	.05
	Future		-.11	-.20	-.02	.04
Present Fatalist	Immediate	-.27		-.47	-.10	.01
	Future		-.14	-.28	-.06	.01
Future	Immediate	.42		.23	.56	.02
	Future		.22	.10	.35	.02
Future Negative	Immediate	-.20		-.35	-.06	.01
	Future		-.11	-.18	-.03	.01
Immediate	Future	.53		.37	.70	.01

In Table 23 we can find more details about the global and comparative fit indices of the two tested models. Taking into account these results, we consider that of the tested models, Model 2 is the one that presents the best adjustment to the data. This model presented the lowest value in Akaike's Information Criterion (AIC = 726.19), as well as in the Modified Expected Cross-Validation Index (MECVI = 3.51). Also, the differences in the  $X^2$  estimate between Model 1 and Model 2 were statistically significant ( $\Delta X^2_{Model\ 2-Model\ 1} = 876.19, p < .001$ ).

**Table 23.***Mediational Models of Consideration of Future Consequences Fit Indices and Model Comparison*

	$\chi^2$	<i>df</i>	$\Delta\chi^2$	$\Delta df$	$\chi^2/df$	AIC	MECVI	CFI	PCFI	GFI	PGFI	NFI	RMSEA
Model 1	1454.38	991	-	-	1.5	1728.38	8.45	.86	.79	.79	.69	.67	.05
Model 2	578.19	361	876.19	630	1.60	726.19	3.51	.86	.77	.84	.70	.71	.05

*Note.* Neither RMSEA result presented statistical significance ( $p > .05$ )

### 2.4.2 Discussion

The goal of this study was to propose a structural model of the association of concept of Time Perspective (Zimbardo & Boyd, 1999), manifested through seven dimensions (Past Positive, Past Negative, Present Hedonist, Present Fatalist, Future, Future Negative and Transcendental Future), with the concept of Consideration of Future Consequences (Strathman et al., 1994), manifested through two dimensions (Future and Immediate). The nature of this proposed association is predictive, with Time Perspective functioning as a predictor of the Consideration of Future Consequences. The basis for this assumption was Aspinwall's (2011) considerations about the nature of both concepts. Thus, according to this author the concept of the Consideration of Future Consequences refers to a subjective evaluation that current behaviour has implications for possible future or present results or outcomes. Petrocelli (2003) also reflects on this same concept and defends it as a cognitive process by which individuals can evaluate situational demands and produce an adequate behaviour in order to achieve a desired outcome. Taking into account these conceptualizations we see the Consideration of Future Consequences as a

possible sub-dimension of Future or Present Time Perspectives, especially as a cognitive/affective process which aids individuals during decision making.

The first model to be tested included all seven temporal dimensions (or Time Perspectives in this specific case) proposed as the theoretical and operational model of Time Perspective in the scope of this study. It presented some dimensions that did not achieve an association with significant statistical results, those being the two dimensions related with the Past (Past Positive and Past Negative) and a dimension related with the Future (Transcendental Future). These results do not come as a surprise to us, since our understanding is that in the cognitive process that represents evaluating present demands, past-related thinking should have neither a direct nor an indirect influence; this assumption is based on past studies which have suggested that the subjective past dimensions are usually more related to affective states or cognitive phenomena such as subjective well-being, college adaptation (Ortuño et al., 2013c), or self-esteem (Ortuño & Vásquez, 2013) among others.

Concerning the Transcendental Future, this result was also expected since the nature of this particular temporal dimension, even though related with a future temporal frame, is transcendent, mystical or even urges towards supernatural phenomena, which are more related to issues away from the individual's life space; as a consequence it would require an overly wide Future Temporal Extension that permits individuals to think that far into the Future. Also it is important to consider that the cognitive process behind the concept of

the Consideration of Future Consequences is to determine which actions would result in what kind of near or far outcomes, and since the Transcendental Future is related with a temporal frame whose characteristics individuals are truly not capable of describing or knowing (due its supernatural features), it would be improbable to present an association between those two variables. Finally, the items assessing the Consideration of Future Consequences are more related to the so-called “mundane” future as referred by Zimbardo & Boyd (2008) which is related to activities encompassed in the individual’s objective or material life space.

Hence, the second model which was tested (Model 2) only included four Time Perspectives related with the Present and the Future (Present Hedonist, Present Fatalist, Future and Future Negative). These dimensions showed a clear direct influence on the Immediate dimension of the CFCS. Future Time Perspective was the only predictor with a positive association to it, and all the other three were negative; nevertheless, the four predictors presented statistically significant associations with the Immediate dimension. This same associative pattern was observed through a mediation analysis in which those four Time Perspectives failed to have a direct effect on the Future dimension of the CFCS, but presented a significant and indirect effect on the Future dimension of the CFCS.

At a chronological and even at a developmental level this model reflects the notion that individuals must first develop the evaluative notions of their

environment related to the present moment, or to a lesser extent, to the near future and can only then develop evaluative capabilities that cover a more extended temporal horizon. As a developmental process these considerations are in alignment with S. Freud's conceptions about the development of both the pleasure and the reality principles (Freud, 2004).

Regarding the dependent variables variance, the results are encouraging, as in both CFCS dimensions the amount of variance explained is moderate and the elimination of the past dimensions did not affect the predictive power of the proposed model in a significant way.

Overall, the obtained results point to the fact that the three negative temporal dimensions (Present Hedonist, Present Fatalist and Future Negative) can disrupt the consideration of consequences at an immediate or at a future level, while the Future dimension can reinforce it.

## **2.5 The relation between Time Perspective and Sensation Seeking**

### ***2.5.1 Results***

In order to assess a possible relation of Time Perspective as a predictor of the concept of Sensation Seeking, it was developed a structural model which

proposed the relation between those psychological dimensions. The measurement sub-model regarding Time Perspective is the model proposed in Sub-chapter 2.1 A New Multidimensional Model of Time Perspective and concerning Sensation Seeking the initial measurement sub-model is the same proposed in Sub-chapter 1.3.2 Study 2: AISS CFA, which is composed by a reduced version of 12 items of the Arnett Inventory of Sensation Seeking. The defined structural sub-model proposes Time Perspective as predictor of Sensation Seeking. The complete path diagram can be found in Figure 23.

This initial model presented varied results regarding its global adjustment to the data, some were unacceptable (CFI = .83, GFI = .77) while others were acceptable ( $\chi^2/df = 1.53$ , PCFI = .77, PGFI = .68, RMSEA = .05,  $p > .05$ ). The quantity of variance explained on the dependent variable (Sensation Seeking) was small ( $R^2 = .16$ ). The pattern of association between the predictors and the dependent variable is expected Past Positive ( $\beta = .10$ ,  $p > .05$ ), Past Negative ( $\beta = -.13$ ,  $p > .05$ ), Present Hedonist ( $\beta = .11$ ,  $p > .05$ ), Present Fatalist ( $\beta = -.04$ ,  $p > .05$ ), Future ( $\beta = -.23$ ,  $p < .05$ ), Future Negative ( $\beta = .22$ ,  $p > .05$ ) and Transcendental Future ( $\beta = .12$ ,  $p > .05$ ); still six on seven predictors failed to achieve a significant association with the Sensation Seeking dimension, only Future was significant at a  $p$ -value of 95%. Also the intensity of the associations was small, only Future and Future Negative exceeds the .20 mark in the standardized regression weights ( $\beta$ ).

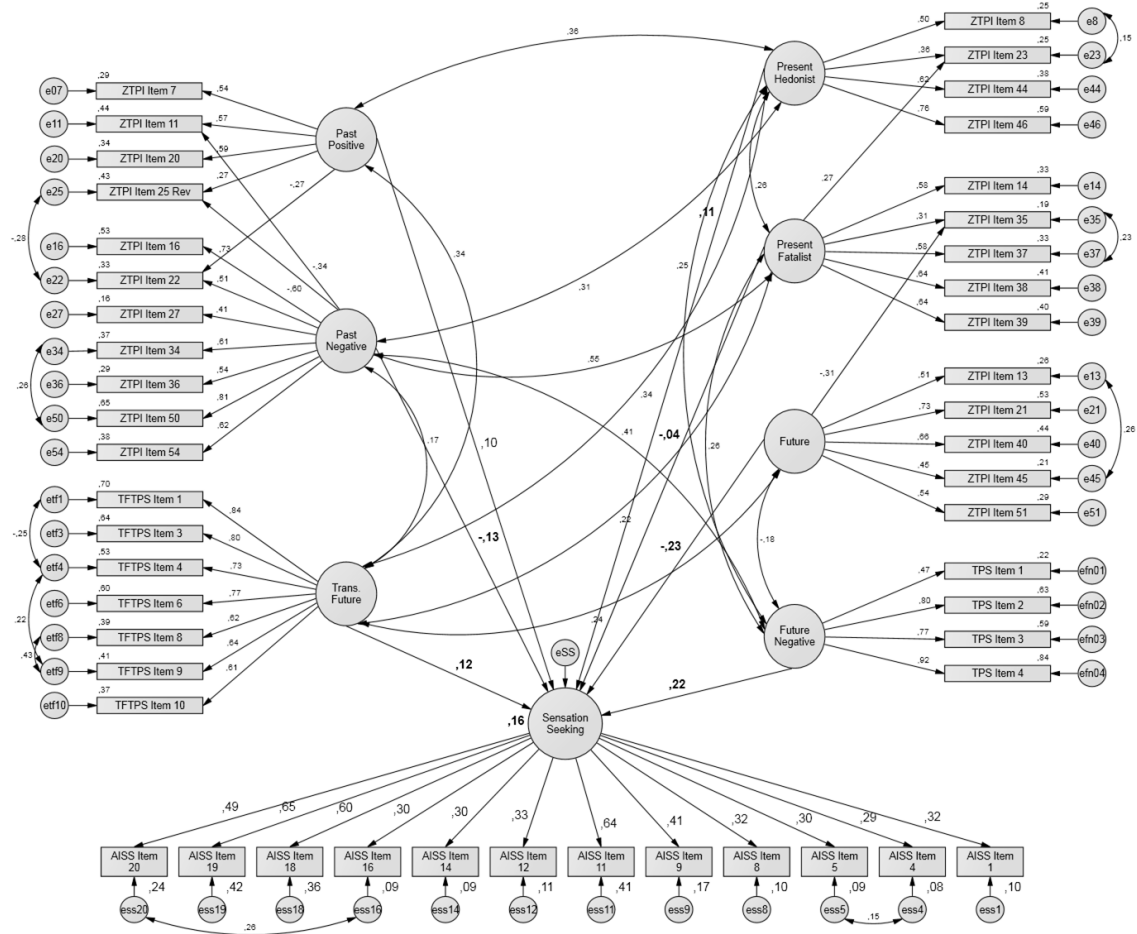


Figure 23. Path Diagram of the Proposed Model of the Regression Analysis of the Concept of Sensation Seeking (Model 1)

Considering the inadequate results obtained through Model 1, it was decided to remove all the predictors without a significant association ( $p < .05$ ) with the dependent variable. Resulting from this procedure, the following model to be tested is formed only by one temporal dimension (Future) as predictor of Sensation Seeking. This new model (Model 2) path diagram can be found in Figure 24, such model presented a bad adjustment in several of the assessed fit indices (CFI = .86, NFI = .72) and when compared with the previous Model 1 the



statistical improvements of the model are not clear (for a comparison between models, please consult Table 24). Also, the amount of variance explained by Model 2 regarding Sensation Seeking is low ( $R^2 = .05$ ). The effect of the Future dimension in the Sensation Seeking is negative, small to moderate and statistically significant ( $\beta = -.23, p < .05$ ).

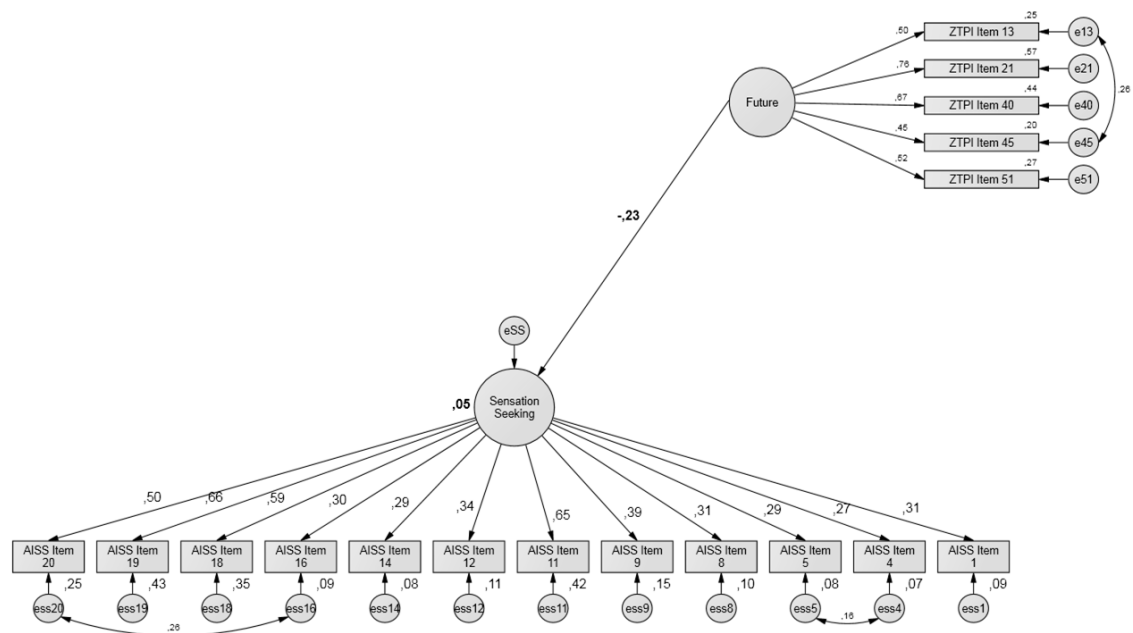


Figure 24. Path Diagram of the Corrected Model of the Regressional Analysis of the Concept of Sensation Seeking (Model 2)

**Table 24.**  
Fit indices and model comparison of the Regressional SS <- PT Models

	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	$\chi^2/df$	AIC	MECVI	CFI	PCFI	GFI	PGFI	NFI	RMSEA
Model 1	1597.67	1045	-	-	1.53	1859.67	9.05	.83	.77	.77	.68	.63	.05
Model 2	194.04	115	1403.63	930	1.69	270.04	1.29	.86	.73	.91	.68	.72	.06

Note. Both RMSEA results presented not statistical significance ( $p > .05$ )

### 2.5.2 Discussion

The objective of this study was to test a possible predictive relation of Time Perspective on the concept of Sensation Seeking. Theoretically, this concept appears as negatively correlated with the Future Time Perspective and positively with the Present Hedonist Time Perspective, while it presents residual correlations with the other Time Perspectives (Zimbardo & Boyd, 1999), also its definition deeply related with the pursue of intense (Arnett, 1994), varied, novel and complex stimuli and experiences (Zuckerman, 1979) lead us to think that Sensation Seeking, through a robust statistical analysis would be strongly related with Time Perspective, at least with its Present and Future dimensions and also, that Time Perspective as a pervasive cognitive influence that is deeply rooted in the decision making process would be a clear predictor of Sensation Seeking.

Yet, our interpretation of the results is that Time Perspective doesn't hold a predictive value of the Sensation Seeking concept. In the Model 1 using all the temporal dimensions of our theoretical model, the amount of variance explained is low ( $R^2 = .16$ ). In the second model tested (Model 2) the amount of variance explained was even lower ( $R^2 = .05$ ), as so we believe that Sensation Seeking cannot be meaningfully predicted by Time Perspective. Still, it's possible to obtain some useful information about how these two concepts related with each other.

Analyzing the associational pattern between the Time Perspective dimensions and Sensation Seeking in Model 1, we believe that the experience

looking for new and intense sensations is not related with the past successes or failures, is more a process related with the present in the form of the sensation to be experienced itself and the future in the form of the possible consequences of the behaviour that is to be commenced.

Also, due to the lack of association with the Present Fatalist, which is a dimension deeply related with an external locus of control and low self-esteem (Zimbardo & Boyd, 1999), we believe that high sensation seekers individuals could be characterized by a high self-esteem and an internal locus of control.

And last, this experience of sensation seeking appears to be related with quotidian activities, without a deep and transcendental meaning to the individual itself, since the Transcendental Future was one of the dimensions which lacked of a significative effect on Sensation Seeking.

Yet, it would be important to consider that the lack of a significant association between Time Perspective and Sensation Seeking may be due to sample characteristics, which is composed only by college students, a population that is frequently referred as being highly future-oriented (De Volder & Lens (1982; Krajcir & Sundberg, 1979) and with lower values in Sensation Seeking (Arnett, 1996). As so, in future studies a more diversified sample could help shred more light in the topic of how Time Perspective relates with Sensation Seeking. Another issue to be considered in future studies is related with the quality of the measures of Sensation Seeking; the two more obvious and well-known options are the Arnett Inventory of Sensation Seeking (Arnett, 1994) and

the Sensation Seeking Scale (Zuckerman et al., 1979), which in our opinion after consulting the specialized literature presents psychometric and structural problems (Carretero-Dios & Salinas, 2008; Desrichard et al., 2008; Haynes et al., 2000; Lourey & McLachlan, 2003; Roth & Herzberg, 2004 ; Zarevski et al., 1998).

## 2.6 The relation between Time Perspective and Self-Esteem<sup>14</sup>

### 2.6.1 Results

All the variables presented a normal univariate distribution ( $sk < 3$ ;  $ku < 10$ ). The multivariate normal distribution was not achieved ( $ku = 243.99$ ), yet it was not considered as a problem, due to the use of Maximum Likelihood method. No multicollinearity problems were found, since all the exogenous variables presented acceptable VIF values ( $VIF < 5$ ; Marôco, 2010).

In Table 25 descriptive statistics and Pearson correlations among the variables are presented. RSES scores are significant and negatively correlated to Past Negative, Future Negative and, to a lesser extent, to Present Fatalist. All the ZPTI variables are correlated in the expected way. Future Negative is moderately correlated with Past Negative and Present Fatalist ZPTI scales. Transcendental

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<sup>14</sup> Fragments of this section contents and data were previously published in Ortuño & Vasquez (2013).

Future shows mild positive correlations with all other TP variables except for Future Negative.

Table 25. Means, Standard Deviations and Correlations of RSES, ZTPI, TFTPST and TPS (n = 473)

	<i>M</i>	<i>S.D.</i>	1	2	3	4	5	6	7
1. Self-Esteem (RSES)	30.80	4.90	-						
2. Past Positive (ZTPI)	3.72	.56	.08	-					
3. Past Negative (ZTPI)	2.73	.65	-.55**	-.08	-				
4. Present Hedonist (ZTPI)	3.57	.45	.04	.25**	.13**	-			
5. Present Fatalist (ZTPI)	2.39	.54	-.18**	.14**	.38**	.30**	-		
6. Future (ZTPI)	3.60	.43	.08	.14**	-.06	-.27**	-.25**	-	
7. Transcendental-Future (TFTPST)	2.84	.80	-.02	.20**	.14**	.17**	.20**	.16**	-
8. Future Negative (TPS)	8.54	4.76	-.36**	-.09*	.39**	.10*	.23**	-.18**	-.10*

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

An exploratory predictive model (Model 1) using structural equation modeling with Maximum Likelihood estimation was employed to examine the relations between seven Time Perspective variables and Self-Esteem. The initial proposed Model 1 failed to achieve acceptable fit indices (CFI = .73, GFI = .73; more information in Table 26). As such, we decided to test a second model, theoretically more robust.

Table 26. Fit Indices and Model Comparison

Model	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	$\chi^2/df$	AIC	MECVI	CFI	PCFI	GFI	PGFI	NFI	RMSEA
Model 1	6336.81	3040	-	-	2.08	6736.81	14.42	.73	.70	.73	.69	.59	.05
Model 2	1985.94	797	4350.87	2243	2.49	2197.94	4.69	.82	.76	.82	.72	.73	.06
Model 3	510.16	242	5826.65	2798	2.11	626.16	1.34	.94	.83	.91	.74	.89	.05

Note.  $\Delta\chi^2$  compared with the initial seven dimensions model.

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

Therefore, the modified model (Model 2, see Figure 25) using four temporal dimensions (Past Positive, Past Negative, Present Fatalist, and Future Negative), predicts a considerable amount of Self-Esteem variance ( $R^2 = .39$ ,  $p < .001$ ). This model presented better fit indices when compared to the previous Model 1. Still, in absolute terms the fit indices of Model 2 were barely acceptable ( $\chi^2/df = 2.5$ , CFI = .82, PCFI = .76, GFI = .82, PGFI = .72, RMSEA = .06). Regarding the trajectories of the exogenous variables, two are statistically significant: 'PN $\rightarrow$ SE' ( $\beta_{\text{Self-Esteem.PastNegative}} = -.52$ ,  $p < .001$ ) and 'FN $\rightarrow$ SE' ( $\beta_{\text{Self-Esteem.FutureNegative}} = -.18$ ,  $p < .001$ ). The other two trajectories are not statistically significant, with neither presenting an expressive magnitude: 'PP $\rightarrow$ SE' ( $\beta_{\text{Self-Esteem.PastPositive}} = .06$ ;  $p = .36$ ) and 'PF $\rightarrow$ SE' ( $\beta_{\text{Self-Esteem.PresentFatalist}} = .09$ ,  $p = .13$ ).

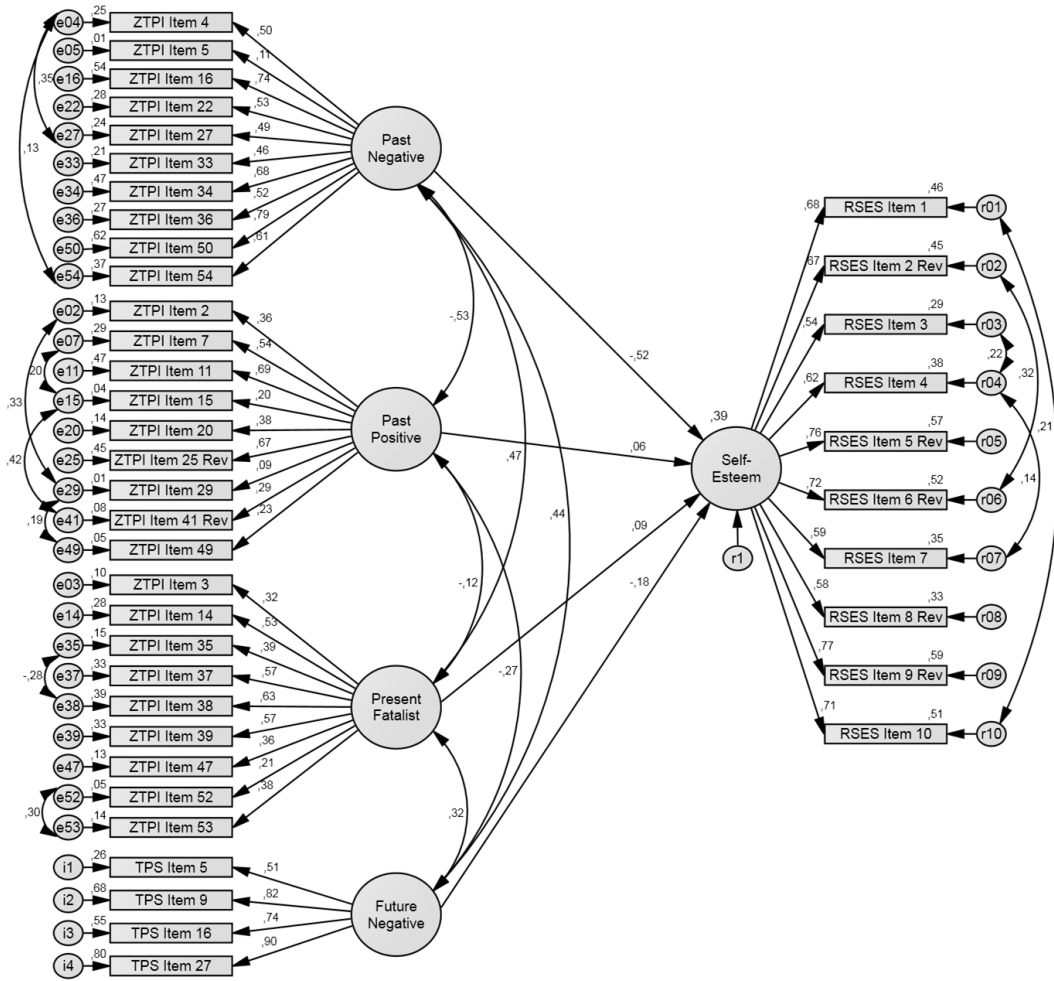


Figure 25. Model 2 Path Diagram (Standardized Estimates)

Considering these results, the exogenous variables without significant statistical predictive power ( $p < .05$ ) were removed (Past Positive and Present Fatalist) in order to test a new model, composed only of Past Negative and Future Negative as predictor variables.

This last model (Model 3, see Figure 26) still predicts a considerable amount of Self-Esteem variance ( $R^2 = .39, p < .001$ ) using only two temporal dimensions: Past Negative ( $\beta_{\text{Self-Esteem.PastNegative}} = -.52, p < .001$ ) and Future

Negative ( $\beta_{\text{Self-Esteem.FutureNegative}} = -.17, p < .001$ ). The fit indices of Model 3 are considerably better than previous models fit indices ( $\chi^2/df = 2.1$ , CFI = .94, PCFI = .83, GFI = .91, PGFI = .74, RMSEA = .05).

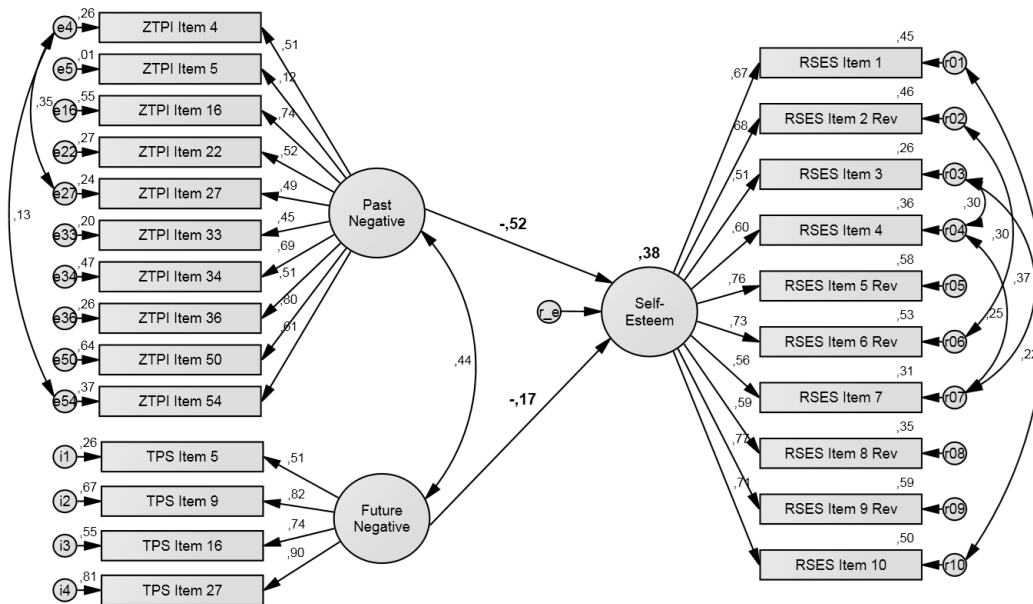


Figure 26. Model 3 Path Diagram (Standardized Estimates)

Via Akaike’s Information Criterion analysis – AIC and Modified Expected Cross-Validation Index – MECVI in all three models (see Table 26), Model 3 was considered as the most parsimonious, as well as the most stable in the studied population (Marôco, 2010), as it presented the lowest values in those estimates (AIC = 626.16, MECVI = 1.34). Also, considering the differences in the  $\chi^2$  estimate compared with the original Model 1 (Model 3  $\Delta\chi^2 = 5826.65 > \text{Model 2 } \Delta\chi^2 = 5136.77$ ), Model 3 appears as the best model.



### 2.6.2 Discussion

The goal of this study was to determine which temporal dimensions are related to Self-Esteem. In order to achieve that, three models were tested. The first one (Model 1), formed by seven temporal dimensions, showed good predictive power but failed to display good fit indices. Model 2, composed of four temporal dimensions, also presented a good predictive power and better fit indices, but it was still not acceptable. The last model tested (Model 3) not only showed good fit indices, but also presented practically the same predictive power of the previous models. Thus, it was considered as the most parsimonious of the three tested models.

On Model 3 the direction of the relation of the two exogenous variables regarding the endogenous variable was expected. Past Negative and Future Negative presented a negative relation with Self-Esteem, a similar result to the ones that have been reported regarding their relation with other adaptive psychological constructs, such as: Emotional Stability and Impulse Control (Zimbardo & Boyd, 1999), Altruistic Values (Milfont & Gouveia, 2006), Big Five Agreeableness (Dunkel & Weber, 2010), and Satisfaction with Life (Boniwell, 2005), in the case of Past Negative, and School Well-Being and Adaptation (Nobre & Janeiro, 2010), Satisfaction with Life, Psychological Well-Being and Emotional Balance (Ortuño et al., 2013c), in the case of Future Negative. Moreover, results obtained in Model 3 are quite similar to those presented by Ortuño et al. (2013a) in a regression study, since Past Negative and Future Negative were also strongly and significantly associated with Self-Esteem. The

only difference comparatively with Ortuño et al. (2013a) was regarding Present Hedonist Time Perspective, which was not significantly associated with Self-Esteem in the present study, result also verified by Zimbardo & Boyd's (1999). We suppose that striving for hedonism could be present both in individuals either with high and low Self-Esteem. Also, the lack of relevance of Present Hedonist could be related to the sample composition, since is formed only by college and female students, who are known to present lower values in this temporal dimension. Contrary to what could be expected by the terror management theory, belief in a transcendental life could function as an anxiety buffer promoting Self-Esteem, but our data does not match with this idea. No correlations or effects were found, thus giving some additional support to the sociometer theory<sup>15</sup>. Past Positive, Present Fatalistic, and Future ZPTI scales were also found to have no consistent effects on Self-Esteem. In general, our findings support the idea that depression, negative affect and Self-Esteem belongs to a common temperamental core (Neiss et al., 2009; Watson et al., 2002). Low levels of global Self-Esteem imply general negative affect and a more negative vision of the future, which is also a symptom of clinical depression. Negative evaluations

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<sup>15</sup> Two main accounts were postulated to explain the origin and function of Self-Esteem: one known as the anxiety buffer in the context of terror management theory, and sociometer theory. In the first theory, Self-Esteem is a buffer which people have against existential fear at the prospect of their own death, serving as a distal defense mechanism. That defense is activated when the person is convinced that he or she acts in a culturally relevant way and are psychologically protected from own death-concerns (Pyszczynski, Greenberg & Solomon, 1999). On the other side, the sociometer theory postulates that Self-Esteem is a psychological meter to measure the quality of the social life of people and of their relationships with others. This psychological mechanism is conceived in order that people can self-control how they are being rejected or accepted by other members of their community (Leary, 1999).

about one's own past are also considered to produce a self-depletion state that reduces the evaluation of one's own worthiness.

We would like to highlight some limitations of this study. Even though the sample size was large enough to successfully develop the proposed statistical analyses, the composition of the sample was very homogeneous: mainly female university students. It is important to replicate this study with more heterogeneous samples in order to know if the reported associations between Time Perspective and Self-Esteem present a similar pattern in participants of different age groups and occupations. Likewise, the next group of studies about Time Perspective and Self-Esteem should include other constructs that are proven predictors of Self-Esteem, in order to determine if Time Perspective could mediate or moderate their relations. For example, a future study could include analyses with variables such as depression symptoms, personality variables and negative emotionality to explore how the time dimensions could be included in the description of the temperamental core (Neiss et al., 2009). We should note that there are other facets of TP not in the scope of this study, such as temporal extension or temporal density that could be also related to Self-Esteem.

Considering the obtained results regarding Self-Esteem, which is an important variable of the individual's psychological functioning, Time Perspective should be pondered as a keystone in the creation of a new generation of therapeutic programs in which the subjective notions of time have a central role in the modification of cognitions and behaviors – as for example the Time

Perspective Therapy (Sword, Sword, Brunskill, & Zimbardo, 2013). Finally, we consider that more research studies should be carried out in order to more fully understand which other constructs can be affected by the Time Perspective.

## Chapter 3

### *Time Perspective Stability*

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In this chapter we intend to explore the stability of Time Perspective. The first section (see 3.1 Temporal Changes in Time Perspective) will present results related to the temporal stability of Time Perspective, while the second sub-chapter (see 3.2 Context Influence on Time Perspective) will serve to analyse the contextual stability of Time Perspective through two contexts (college and home). Each sub-chapter will be comprised of a results section and a discussion section.

### **3.1 Temporal Changes in Time Perspective**

Generally, contemporary authors consider most of the temporal variables as stable constructs. In the case of Time Perspective, Zimbardo & Boyd (1999) and also Husman & Shell (2008) are amongst authors who defend that Time Perspective is a relatively stable construct (especially in the short term). Yet, no study has explored empirically to what extent Time Perspective is stable across time. A few efforts have been made in the past but using always a transversal

design (Ortuño, Janeiro & Paixão, 2011, July), a fact which prevents researchers from being able to claim or not the temporal stability of Time Perspective as a cognitive process.

Following this logic we intend with this study to test the temporal stability of Time Perspective and Temporal Extension across a temporal interval of one year.

### *3.1.1 Results*

The first point we would like to mention is regarding the statistical analysis carried out. The chosen technique was a repeated measures analysis; in this type of statistical technique it is common to verify first the sphericity of the variables through Mauchly's test of sphericity. However, information regarding the variables's sphericity cannot be presented since Mauchly's test of sphericity was not calculated by the statistical software. The reasons behind this are related with the number of levels used in the statistical analysis that was developed, since just two levels were defined (first and second moment of assessment) for each one of the temporal dimensions; as such this test has no use because it tests the difference between all the combination of levels and this study, using only two levels, has only one possible combination of variance to explore (first moment variance x second moment variance).

The results presented in Table 27 show the differences in the seven Time Perspectives between the first and the second assessment waves. The  $p$ -values in all the seven Time Perspectives indicate that no statistically significant differences were detected in the participants between the first and the second moment ( $p > .05$ ). Nevertheless, some of the dimensions presented an increase in the second moment of assessment (Past Positive, Future and Future Negative) while others decreased (Past Negative, Present Hedonist, Present Fatalist and Transcendental Future). These results can be respectively seen in Figure 27 (Past Positive), Figure 28 (Past Negative), Figure 29 (Present Hedonist), Figure 30 (Present Fatalist), Figure 31 (Future), Figure 32 (Future Negative) and Figure 33 (Transcendental Future).

The Present Fatalist and the Future Negative are the temporal dimensions with a highest difference between the two moments; the mean difference between moments was .34 in the Present Fatalist and -.20 in the Future Negative.

**Table 27.**  
*Repeated Measures Descriptive Statistics, Within-Subjects Contrasts and Estimates*

Variable	Moment	<i>M</i>	<i>SD</i>	Lower Bound	Upper Bound	<i>df</i>	<i>F</i>	<i>p</i>	Mean Difference (Moments 1-2)
Past Positive	1	3.67	.49	3.55	3.79	1	.375	.542	-.03
	2	3.70	.51	3.57	3.82				
Past Negative	1	2.82	.62	2.66	2.97	1	1.05	.309	.08
	2	2.74	.69	2.57	2.91				
Present Hedonist	1	3.49	.48	3.37	3.61	1	.026	.872	.01
	2	3.48	.48	3.37	3.60				
Present Fatalist	1	2.47	.56	2.34	2.61	1	.259	.612	0.34
	2	2.44	.53	2.31	2.57				
Future	1	3.57	.42	3.46	3.67	1	.569	.453	-.04
	2	3.61	.49	3.49	3.73				
Future Negative	1	8.54	4.76	7.36	9.72	1	.130	.719	-.20
	2	8.74	4.27	7.68	9.80				
Transcendental Future	1	3.01	.65	2.85	3.18	1	2.100	.152	.09
	2	2.93	.68	2.76	3.09				



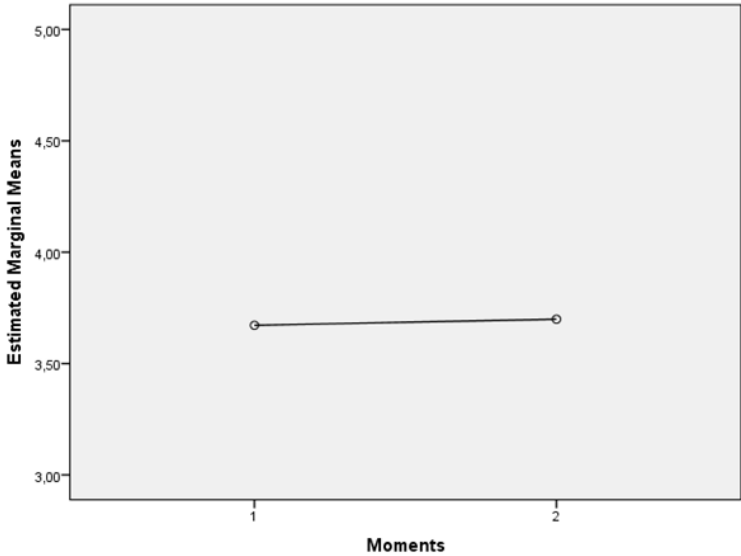


Figure 27. Past Positive Mean in First and Second Assessment Moment

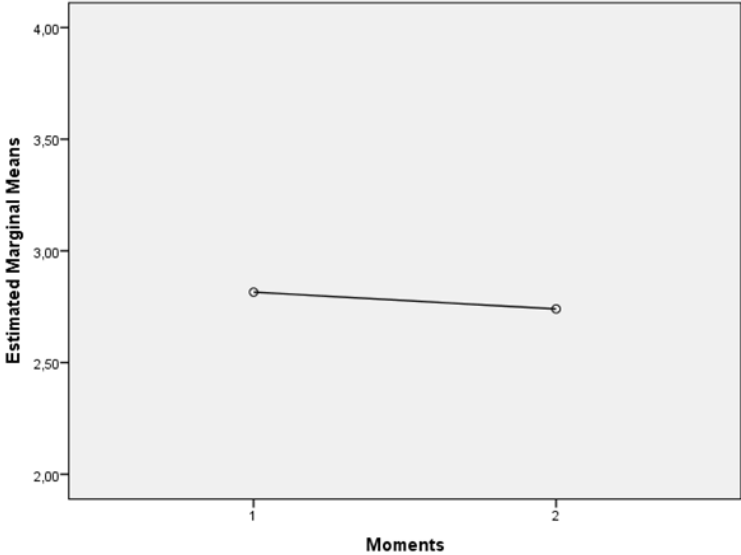


Figure 28. Past Negative Mean in First and Second Assessment Moment

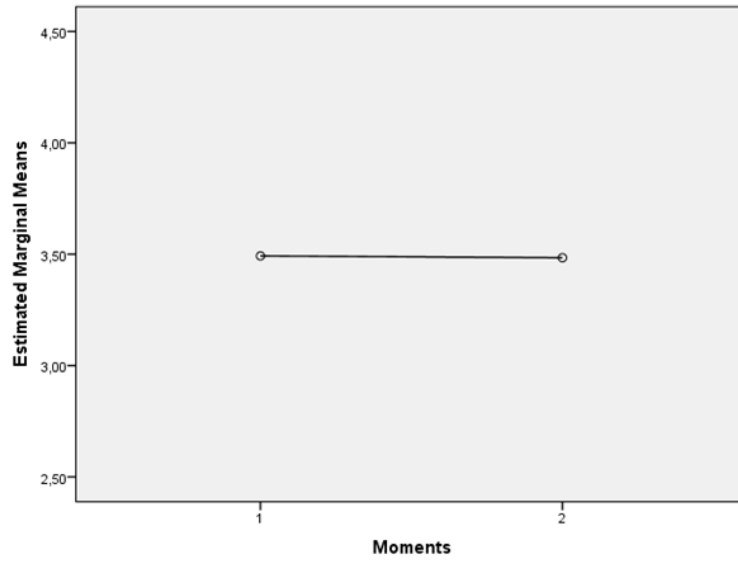


Figure 29. Present Hedonist Mean in First and Second Assessment Moment

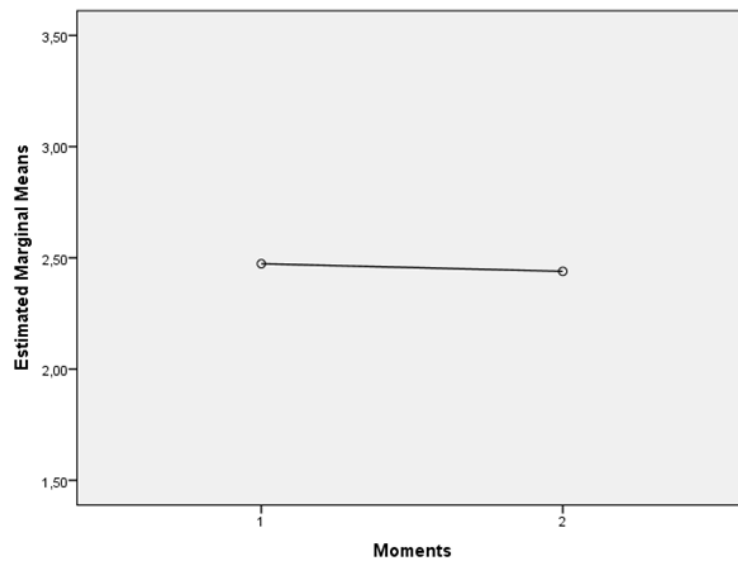


Figure 30. Present Fatalist Mean in First and Second Assessment Moment

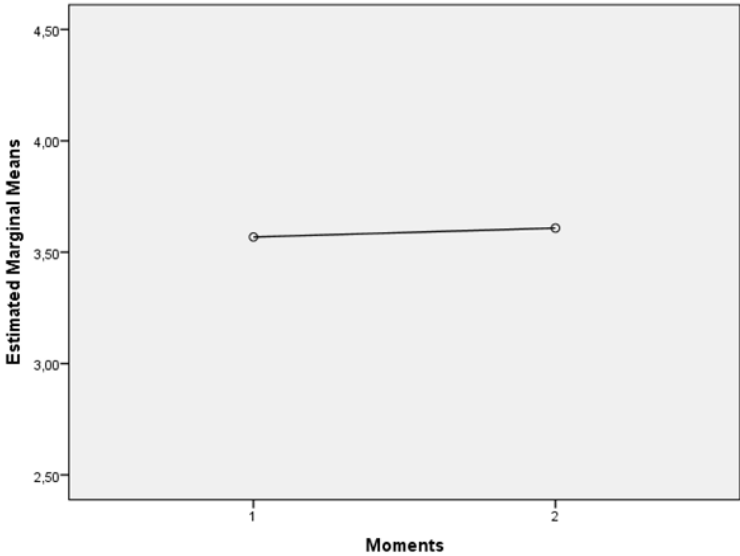


Figure 31. Future Mean in First and Second Assessment Moment

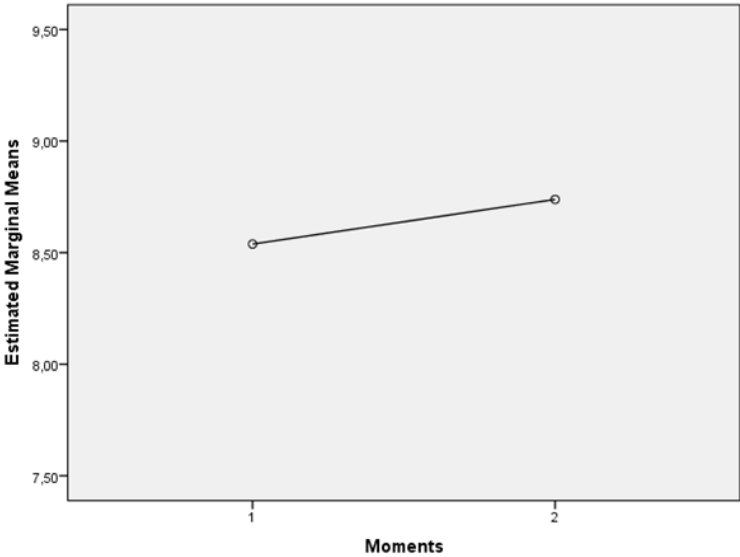


Figure 32. Future Negative Mean in First and Second Assessment Moment

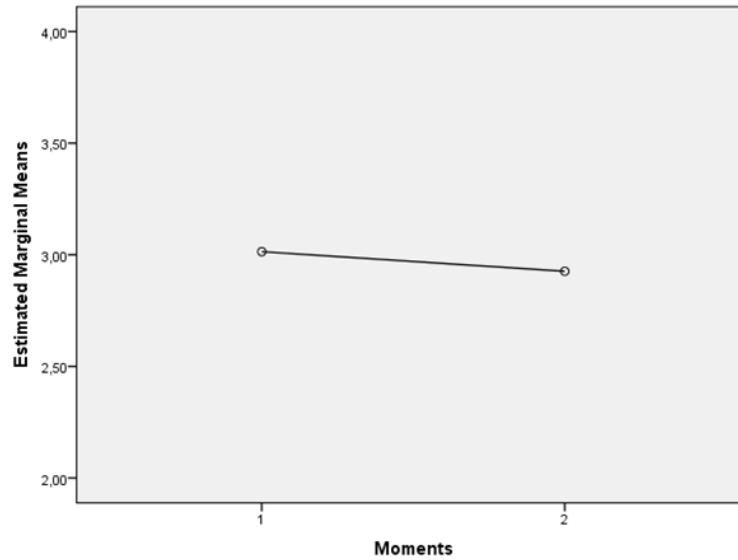


Figure 33. Transcendental Future Mean in First and Second Assessment Moment

In order to test the degree of balance in the participants' Time Perspective, we calculated the Deviation of the Balanced Time Perspective – DBTP following the equation developed by Stolarski et al. (2011); the descriptive statistics regarding this new variable can be found in Table 28. After this a paired-samples t-test was conducted in order to compare the Deviation of the Balanced Time Perspective – DBTP in both waves of assessment. The participants in the second moment of evaluation ( $M = 1.95$ ,  $SD = .55$ ) presented a slightly lower value of DBTP when compared to the first moment of evaluation ( $M = 1.98$ ,  $SD = .56$ ). Nevertheless, these differences in the DBTP were not statistically significant ( $t(64) = .46$ ,  $p = .646$ ).

**Table 28.**  
*DBTP Descriptive Statistics and Paired T-Test (n = 65)*

	<i>M</i>	<i>SD</i>	<i>r</i>	Paired Differences				
				<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
DBTP 1 <sup>st</sup> Moment	1.98	.56	.52***	.03	.54	.46	64	.646
DBTP 2 <sup>nd</sup> Moment	1.95	.55						

\*\*\*  $p < .001$

### 3.1.2 Discussion

The objective of this study was to explore the possible differences in Time Perspective over a one-year period and so the participants' Time Perspective was assessed in two moments with a chronological mean difference of eleven months.

The reported  $p$ -value in the seven Time Perspectives was not statistically significant; yet, it's important to underline that the changes presented by the participants regarding their own Time Perspectives presented an interesting evolution towards a more positive individual Temporal Profile or a more Balanced Time Perspective. Approximately a year after the first evaluation, participants presented slightly higher scores in Past Positive and Future Time Perspectives, while showing slightly lower scores in Past Negative, Present Hedonist, Present Fatalist and Transcendental Future. Only the Future Negative Time Perspective presented a contrary tendency to an adaptive and more functional temporal profile, since it increased from moment one to moment two.

The increase in Past Positive is considered as a positive result in the individuals' temporal profile due to its generally positive associations with positive outcomes such as higher GPA scores (Zimbardo & Boyd, 1999), larger and more supportive social networks (Holman & Zimbardo, 2009), a healthy and responsible lifestyle (Hamilton et al., 2003), mindfulness and subjective happiness (Drake et al., 2008), well-being (Seema et al., 2010, July) and satisfaction with life (Ortuño et al., 2013c), while it also generally presents a negative association with problematic or abnormal functioning variables like the number of failed courses (Zimbardo & Boyd, 1999), binge eating and drinking (Laghi et al., 2012), and depression (Beck et al., 1996).

Following the same pattern, the Future Time Perspective increase can also be considered as a positive result towards a more Balanced Time Perspective since it is generally positively associated with a wide array of adaptive variables such as career planning (Janeiro, 2010), school adaptation and academic well-being (Nobre & Janeiro, 2010), academic performance (Simons et al., 2004), intrinsic work motivation (Van Der Maarel, 2011), and a higher and more effective sense of entrepreneurship (Przepiórka, 2010, July); it usually presents a negative association with damaging or problematic constructs like career indecision (Ferrari et al., 2010), both avoidance and arousal procrastination types (Ferrari & Diaz-Morales, 2007), investment in leisure time (Peetsma, 2000) and student dropout (Zimbardo & Boyd, 1999), among others.

This “evolution” in individuals' temporal profile can be considered as an approximation to the ideal, considered by several authors, as the Balanced Time Perspective – DBTP (Boniwell et al., 2010; Stolarski et al., 2011; Zhang et al., 2013). In order to test this assumption, the DBTP value (Stolarski et al., 2011) was calculated, and the participants presented a slightly better temporal profile (or a more Balanced Time Perspective) in the second moment of evaluation than in the first moment of evaluation, since their DBTP mean value was nearer 0. Nevertheless, the differences between these two moments were not statistically significant, which may be due to the small sample as well the sample characteristics, as it is only composed by college students.

These results allow us to accept the assumption that the individuals' temporal profile is not a static trait. Yet, the factors influencing TP's evolution remain unproven. The published literature points out two possible explanations for these changes. The first is related to the chronological age of the participants: in fact, Thoms & Blasko (2004) defend that the change in individuals' TP over time presents somewhat a curvilinear relation with age, where children show a strong present orientation, while late adolescents and young adults show a decrease in the present orientation and an increase in future orientation. This evolutionary pattern is somehow reflected in our results, yet with a small magnitude due to the temporal interval of just one year in participants' lives.

The second possible explanation is related to the individuals' education level; Lens & Tsuzuki (2007) state that schooling has a pivotal role in the

development of Future Time Perspective, since it is an essentially future-oriented activity. Ortuño et al. (2011a) also defend that education may influence the individuals' Time Perspective toward a more adaptive and functional influence on behaviour. Therefore, individuals in the second year of their degree present a more adaptive temporal profile than in their first year. We believe that these same participants would be even more future-oriented and less present-oriented in the last year of their college training.

Yet, without statistical significance in our results these interpretations are merely speculative, and the reported magnitude of the change in the temporal dimensions between the two moments of assessment was also small. This is the reason why the ultimate reading of these results should support the stability of Time Perspective in a temporal interval of one year in college students. We recommend considering these conclusions with caution, since there are limitations in the sample but also in the experimental design that prevented us from drawing really conclusive statements regarding the – lack of – temporal stability of Time Perspective.

The Future Negative and the Transcendental Future were not considered in the calculation of the DBTP since we did not intend to stray far from the equation for DBTP proposed by Stolarski et al. (2011). Concerning Future Negative, our result does not coincide with the results of Ortuño et al. (2011a) which reported a decrease in Future Negative over time. Regarding the Transcendental Future, the encountered result is comparable with Hartley's



(2004) analysis, in which a decrease was reported in the individuals' religious beliefs and practices over their college training. This type of change, as referred to by Ortuño et al. (2011a) could be related to the scientific nature of the university training, which emphasizes an objective, empiric and analytic view of reality, rather than metaphysical beliefs with little or no scientific validation.

Future studies need to collect data in larger and more heterogeneous samples, and during a more extended temporal period, in order to fully capture the nature of the changes in the individuals' temporal profile.

### **3.2 Context Influence on Time Perspective**

The impact of the contextual environment variables have on the individual's temporal profile represents a research topic with little investment, yet it holds great importance regarding the concept of Time Perspective and its usefulness as a cognitive process with strong effects on individuals' cognitions and behaviours. Thus, in this study we intend to shed some light regarding the impact of two contexts on the participant's temporal profile; in other words we intend to examine the contextual stability of Time Perspective, using a different sample than the last study.

### 3.2.1 Results

As previously mentioned in sub-topic 3.1.1, information regarding the variables' sphericity cannot be presented since Mauchly's test of sphericity was not calculated by the statistical software. The repeated measures analysis was developed with two levels (representing the first and the second moment of assessment) which make the calculation of this test impossible.

The results presented in Table 29 show the differences in the seven Time Perspectives between the first and the second moment of assessment. The  $p$ -values indicate statistically significant differences only in two temporal dimensions, Past Negative and Future, with Past Positive presenting a  $p$ -value near the .05 value ( $p = .08$ ). The remaining temporal dimensions, Present Hedonist, Present Fatalist, Future Negative and Transcendental Future didn't present any statistically significant ( $p > .05$ ) difference between the two moments of assessment.

Regarding the change in the mean values between moments, Past Positive, Present Hedonist and Present Fatalist underwent a decrease, while Past Negative, Future, Future Negative and Transcendental Future increased their mean values. These results can be also confirmed in Figure 34 (Past Positive), Figure 35 (Past Negative), Figure 36 (Present Hedonist), Figure 37 (Present Fatalist), Figure 38 (Future), Figure 39 (Future Negative) and Figure 40 (Transcendental Future). The magnitude of the mean difference between the two moments was generally small, Past Negative being (-.27), Future (-.23) and

Future Negative (-.95) amongst the temporal dimensions with a higher variation between moments.

**Table 29.**  
*Differences in Time Perspective between Places (Repeated Measures Descriptive Statistics, Within-Subjects Contrasts and Estimates) (n= 38)*

Variable	Moment <sup>1</sup>	<i>M</i>	<i>SD</i>	Lower Bound	Upper Bound	<i>df</i>	<i>F</i>	<i>p</i>	Mean Difference (Moments 1-2)
Past Positive	1	3.85	.40	3.71	3.98	1	3.14	.08	.09
	2	3.75	.39	3.63	3.88				
Past Negative	1	2.57	.65	2.35	2.78	1	15.98	.001	-.27
	2	2.84	.70	2.61	3.07				
Present Hedonist	1	3.47	.48	3.31	3.63	1	1.25	.27	.05
	2	3.42	.42	3.28	3.56				
Present Fatalist	1	2.30	.56	2.11	2.48	1	1.38	.25	.09
	2	2.21	.66	1.99	2.42				
Future	1	3.73	.39	3.60	3.86	1	5.76	.02	-.13
	2	3.86	.46	3.71	4.01				
Future Negative	1	7.21	2.62	6.35	8.07	1	1.36	.25	-.95
	2	8.16	4.48	6.69	9.63				
Transcendental Future	1	2.83	.71	2.60	3.06	1	.16	.69	-.03
	2	2.86	.70	2.63	3.09				

<sup>1</sup>Moment 1 refers to the college participation and Moment 2 refers to the home participation.

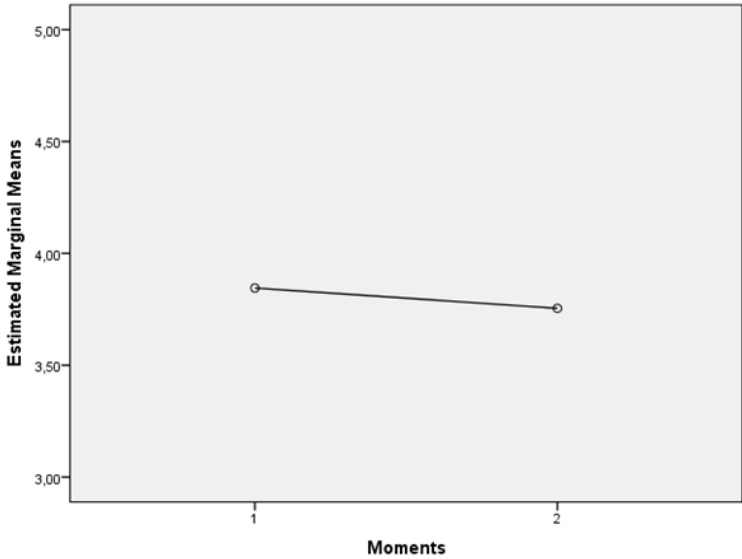


Figure 34. Past Positive Mean in First (College) and Second (Home) Assessment Moment

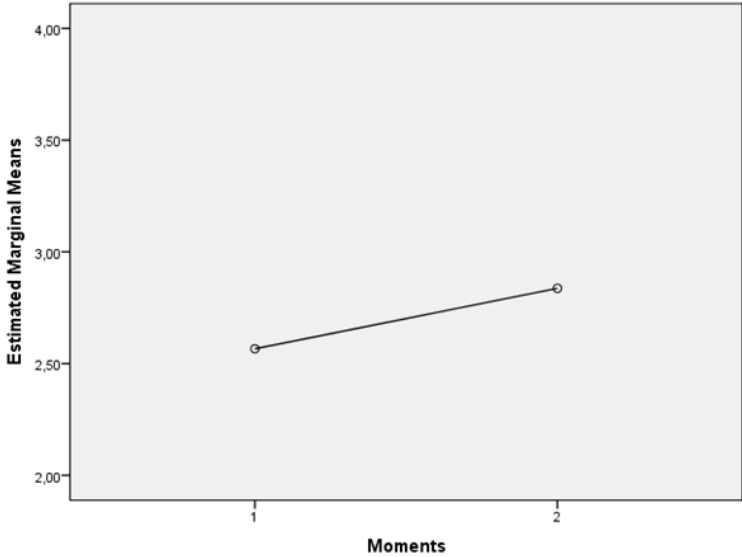


Figure 35. Past Negative Mean in First (College) and Second (Home) Assessment Moment

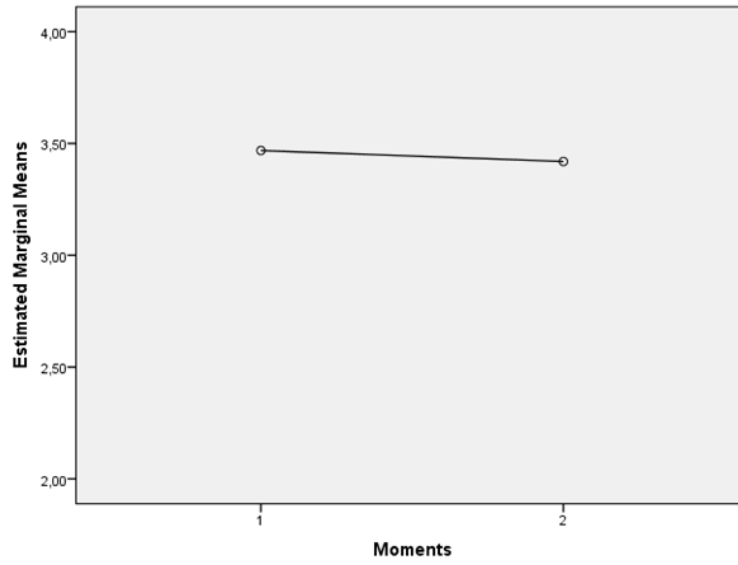


Figure 36. Present Hedonist Mean in First (College) and Second (Home) Assessment Moment

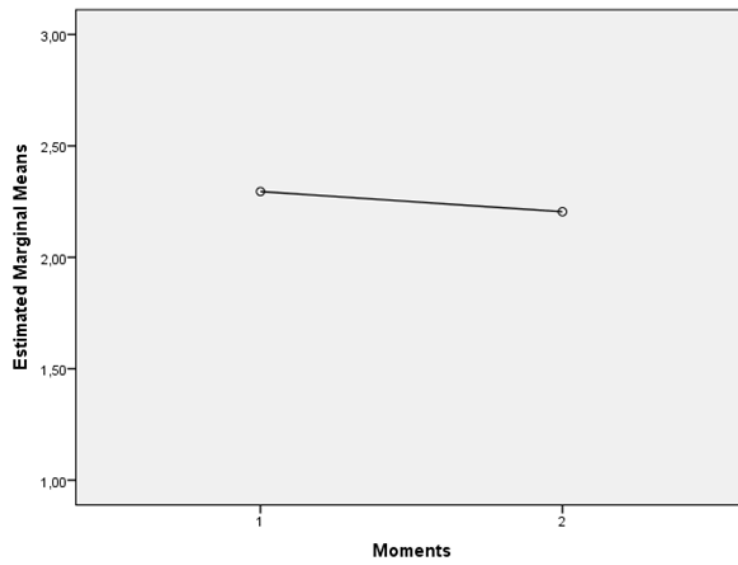


Figure 37. Present Fatalist Mean in First (College) and Second (Home) Assessment Moment

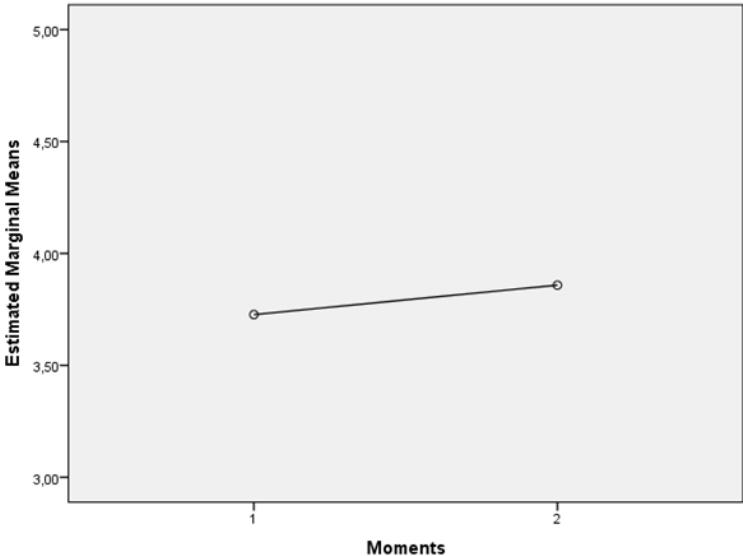


Figure 38. Future Mean in First (College) and Second (Home) Assessment Moment

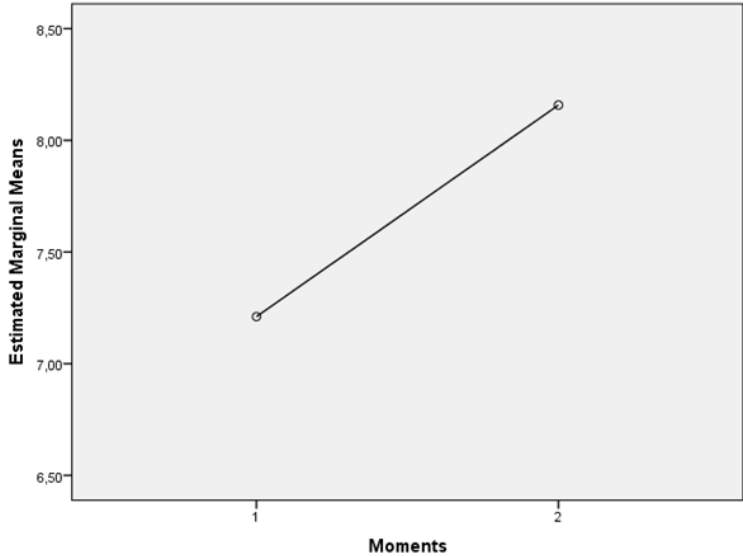


Figure 39. Future Negative Mean in First (College) and Second (Home) Assessment Moment

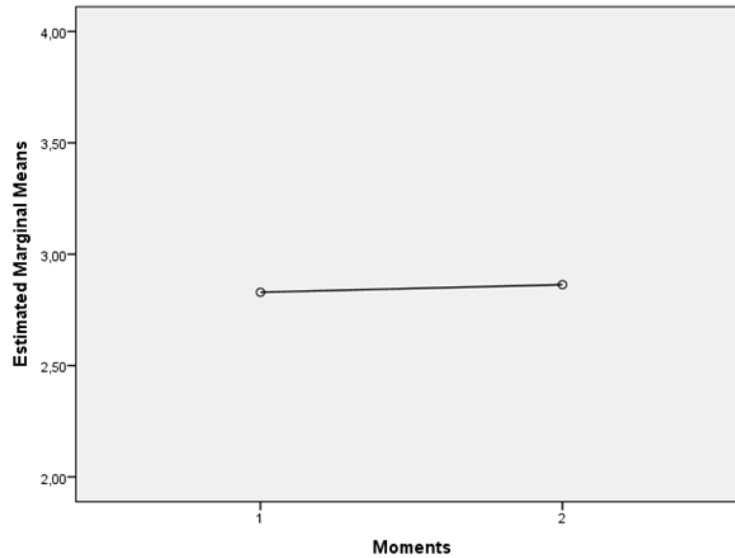


Figure 40. Transcendental Future Mean in First (College) and Second (Home) Assessment Moment

Regarding the differences in Temporal Extension between contexts, we found that the Future Temporal Extension presented an increase ( $M_{\text{College}} = 78.44$ ;  $SD_{\text{College}} = 47.56$ ;  $M_{\text{Home}} = 79.89$ ;  $SD_{\text{Home}} = 59.62$ ) while the Past Temporal Extension experienced a decrease ( $M_{\text{College}} = 36.63$ ;  $SD_{\text{College}} = 30.87$ ;  $M_{\text{Home}} = 31.66$ ;  $SD_{\text{Home}} = 30.88$ ) in their mean values in the home context compared with the college context. Still, these differences did not present statistical significance in both Future Temporal Extension  $F(1, 37) = .03$ ,  $p = .87$  and Past Temporal Extension  $F(1, 37) = 2.93$ ,  $p = .09$ . Concerning the sphericity of the variance of the variables, in the same way as the previous analysis, no results were calculated by the statistical software due the number of levels introduced in the analysis (two levels).



The differences in Future Temporal Extension are graphically reproduced in Figure 41 and the differences in Past Temporal Extension are presented in Figure 42.

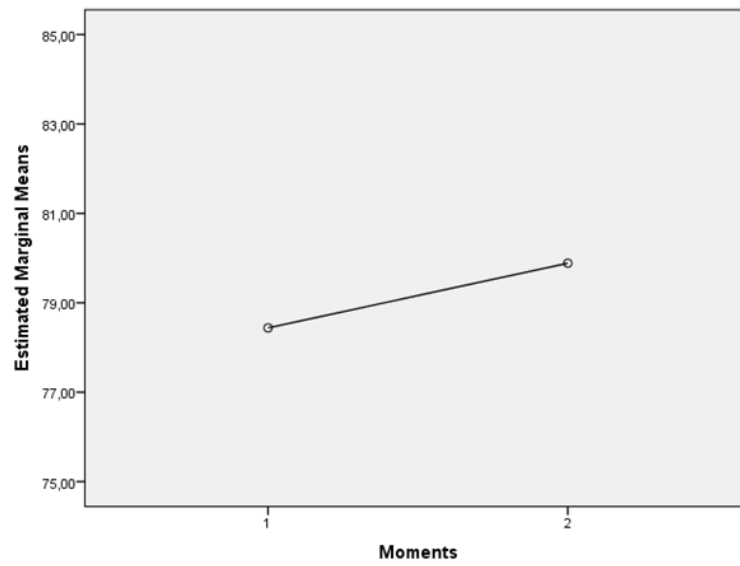


Figure 41. Future Temporal Extension mean in First (College) and Second (Home) Assessment Moment

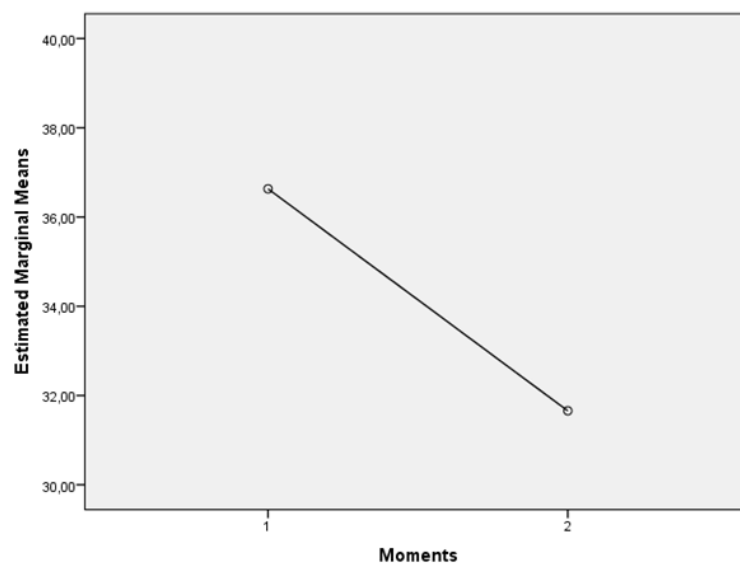


Figure 42. Past Temporal Extension Mean in First (College) and Second (Home) Assessment Moment

### 3.2.2 Discussion

The objective of this study was to explore the possible differences in Time Perspective when the assessment of temporal dimensions is made in different contexts. In this study, participants responded to the questionnaires in two different contexts: the first was in an educational context, a college classroom to be more specific; the second moment was at the participants' home, this second assessment occurred in mean four months after participant's first assessment.

Regarding the effect of context on Time Perspective, we found a small and significant change in two temporal dimensions: Past Negative which is higher in the home context when compared with the college context; and Future, which is also higher in the home context, when compared with the college context. The increase in the Past Negative Time Perspective in the home context can be explained with Zimbardo & Boyd's (1999) thesis of Past Time Perspective being associated with family, roots and traditions; the home is the context in which the family gathers, has its own traditions, reunions and memories and as such it makes sense that being present at home triggers or activates the temporal frames related to the past. We need to consider that a temporal profile with certain characteristics can be adaptive in a determined context but not in others (Ortuño et al., 2013a; Ortuño et al., 2013c; Zimbardo & Boyd, 1999). Taking this into account, we should consider in which context if not the home the individuals would need to activate their Past Time Perspective. Yet, it remains unanswered

why this activation is more directed to the negative dimension of the past, since the Past Positive presented a decrease in the home context when compared with the college context; still it is also true that this difference is small.

On the other hand, concerning the differences in the Future Time Perspective between responses in the college and the home contexts, in the latter participants presented higher values of Future Time Perspective, and this result contradicts several authors' notions about academic contexts as being the most future-oriented (Lens & Tsuzuki, 2007; Peetsma, 2000; Zimbardo & Boyd, 1999).

The remaining temporal dimensions did not present statistically significant differences between the two possible participant's contexts at the moment of answering the questionnaires. Still these results are also contrary to the general theoretical trend, since Past Positive, Present Hedonist and Present Fatalist experienced a decrease in the home context. Future Negative and Transcendental Future experienced an increase in the home context in the same way as Future, and this result appears as a pattern regarding the Future dimensions in the home context, since all three increased. The only plausible explanation we can offer is regarding the Transcendental Future, which is a temporal dimension with strong ties with religions (Boyd & Zimbardo, 1997; Ortuño et al., 2013b), and so this increase in Transcendental Future the home context can be seen as a manifestation of the family traditions and values

regarding religion. This could be confirmed by the fact that most of the sample referred to itself as being catholic.

Considering the obtained results, we see it as difficult to either confirm or reject the idea of Time Perspective stability presented by Zimbardo & Boyd (1999); these authors state that Time Perspective is a relatively stable cognitive process that can however be affected by cultural, educational, religious, social and familiar influences. In this specific case we found that some dimensions are more affected than others by the context, yet the reported change lacks a strong magnitude to consider it as a relevant change. Yet, the small magnitude of these changes can also be related to the reduced temporal interval between assessments; a two-moment assessment in a more extended temporal interval could help to better understand possible changes in individuals' temporal profile.

Regarding the stability of the Temporal Extension, we found no significant differences, so it appears that specific contexts have no effects on the individuals' Temporal Extension. Nevertheless, the mean differences indicate that individuals presented a more extended Future Time Perspective in the home context when compared with the college context, which in our opinion complements the previous results regarding the Future Time Perspective differences in those two same contexts, since participants also presented a stronger Future Time Perspective in the home context.

Concerning the Past Temporal Extension we also observed that the individuals presented a more extended Past Time Perspective in the college

context when compared with the home context; this is probably the result of a complex interaction between three components: i) the individuals' affective valence regarding their past, since, as previously reported, the Past Negative Time Perspective was associated with the home context, ii) the individual's Temporal Extension and iii) the characteristics of the context in which the individual is actually present. We propose two arguments: first, Lennings & Burns' (1998) discussion about how negative feelings, such as frustration, are negatively related to past temporal dimensions (e.g.: extension); second, and as aforementioned in the previous results, the home context appears to be related to the Past Negative. Summarizing, the context would activate the individuals' negative view regarding their own past, which in consequence would undermine the individuals' Temporal Extension.

In the view of Husman & Shell (2008) and Zimbardo & Boyd's (1999) conceptions regarding the high stability of Time Perspective in the short term but also that the assessment of Time Perspective between the first (college context) and the second moment (home context) occurred in a relatively short temporal interval, we believe that any reported change is due to the modification of the context in which the assessment is made.

Yet, in the same way as the previous study, we recommend that these conclusions be considered with caution, since there are limitations in the sample but also in the experimental design that prevent us from drawing really

conclusive statements regarding the – lack of – contextual stability of Time Perspective.

# Conclusions

Research on Time Perspective has evolved considerably in recent years; the number of scientific publications and events dedicated to this unique dimension of the subjective experience of time has experienced a fair increase lately. A substantial progress has also occurred regarding the quality and complexity of the research being produced on this topic, since in contemporary psychology science advanced statistical techniques are being used to answer new and more intricate questions about Time Perspective.

However, the debate is still open about some important aspects of Time Perspective concept, namely: i) Time Perspective structure, since different authors focus on distinct dimensions of Time Perspective or stress the importance of specific temporal frames to the detriment of others; ii) the stability of the Time Perspective concept, although the knowledge to be acquired around the conditions that promote or hinder contextual and/or temporal changes in TP dimensions will inform the way we interpret the influence of this concept on other affective, cognitive and behavioural concepts; and at last, iii) Time Perspective's relation with other variables, once in the TP literature it is still common to find quite contradictory results, which in most cases are due to the lack of a scientific policy regarding the use of comparable techniques and comprehensive conceptual frameworks.



When we launched this research project, it was our intention to address these issues, once throughout our studies we propose a theoretical and statistical model which we believe can be used in different contexts. It provides a comprehensive and useful approach to Time Perspective and its dimensions and we put it to the test together with other constructs in order to assess its predictive power. Additionally, the issue of Time Perspective stability is addressed in this research project through two studies that test the temporal and contextual stability of this concept.

In fact, as already stated, one of the objectives of this study was to explore the stability of Time Perspective regarding two psychosocial dimensions: i) time, in which Time Perspective was assessed in two moments separated by a temporal gap of one year; and ii) the physical present context, which was tested measuring participants' Time Perspective in two different contexts, college and home, and using a small time gap in order to avoid any possible developmental effects in Time Perspective.

Nevertheless, before being able to properly test Time Perspective stability, some necessary preliminary studies were carried out. The first ones successively focused on analyzing the factor structure of the Zimbardo Time Perspective Inventory, using a Confirmatory Factor Analysis, performing the linguistic and cultural adaptation of several instruments (such as: the Transcendental-Future Time Perspective Scale and the Arnett Inventory of Sensation Seeking), and

embarking on the construction of a Temporal Extension measure (the Temporal Extension Inventory of Coimbra).

Next, we tested a proposal for a new multidimensional model of Time Perspective, which includes the five temporal dimensions originally studied by Zimbardo & Boyd (1999), the Transcendental Future (Boyd & Zimbardo, 1997) and a dimension related to the Future Negative (Janeiro, 2012). After obtaining a satisfactory model at a construal and a statistical level, we proceeded to explore its relation with others constructs such as Temporal Extension, Hope, Consideration of Future Consequences, Sensation Seeking and Self-Esteem.

At this point, we would like to make several considerations and draw some conclusions about the main research studies that we carried out.

Regarding the Confirmatory Factor Analysis of the ZTPI, the 56-item version did not achieve good fit indices, yet a brief version of the same instrument composed by 25 items presented good values in several of the tested fit indices.

Concerning the main results obtained using the Transcendental Future Time Perspective Scale, we believe that the TFTPS is a good instrument to be used in Portuguese research studies; in fact, all the statistical indicators we obtained express its overall good quality, allowing it to be used in several contexts, either normative or clinical. Nevertheless, more research studies are needed in order to establish its predictive utility concerning a varied set of cognitive and behavioural constructs.

We believe that with the refinements performed in the structure of TFTPS, its value as an instrument to assess group differences related to the transcendental future (as in an empirical study previously carried out by Ortuño, Paixão & Janeiro, 2011a; 2011b) will improve. Still, we believe that the most relevant Transcendental Future value as a predictive or explanatory variable will be disclosed in studies carried out with older populations, or with groups with deeply grounded beliefs in religiosity and spirituality, mainly due the proximity of the end of the physical life (in the former) and the strong relation that those religious beliefs present with the events which are anticipated for the afterlife (in the latter).

Concerning the results obtained with The Arnett Inventory of Sensation Seeking, especially with the new proposal for a brief version of it, and when comparing it with other international adaptations of the AISS (Carretero-Dios & Salinas, 2008; Desrichard et al., 2008; Haynes et al., 2000; Roth & Herzberg, 2004), as well as with the original AISS (Arnett, 1994), we argue that this cultural and linguistic adaptation is more suitable or appropriate for research purposes; at present, clinical or other field applications should be used with extreme caution, and restraint should be exerted regarding any conclusion to be drawn from the results obtained with it. Nevertheless, the concept of sensation seeking is corroborated as a valid one, as it can be easily seen when analysing the set of associations it bears with other psychological constructs, a pattern of results which helps establish its construct validity in the same way that the AISS was presented by Arnett (1994).

Yet, even when presenting important and coherent correlations with other psychological concepts, the AISS fails to achieve a strong factor structure and internal consistency. In our opinion this could be caused by the items' content; as mentioned by Arnett (1994, p. 290) "*Many of the items in the scale were constructed in relation to a specific sense – sight, hearing, touch, taste/smell, or the kinesthetic sense – although others concern an overall experience involving intensity or novelty.*". While this can constitute an useful and interesting approach to better assess sensation seeking, it could also point to the impossibility of achieving a cohesive factor structure with an inventory of 20 items. In other words, the high heterogeneity found in the items' content (confirmed by the low values in the Item-Total Correlations) results in a low internal consistency. This multi-theme structure is clearly manifest due to the several extracted components in the rotated component matrix of the first EFA (consult Table 12). We suggest two possible solutions to overcome this low consistency problem: i) adding more items to each of the identified content areas or, alternatively ii) introducing substantial changes in the current item contents allowing them to converge around a unique theme (e.g.: Sensation Seeking).

For now, we recommend the utilization of this inventory as a one-dimension instrument, mainly due to its weak psychometric properties. Nevertheless, this does not mean that we disagree with Arnett's (1994) conception of sensation seeking as a personality trait composed by two sub dimensions (intensity and novelty) highly related to it. In fact, our point of view is

opposite to the thesis defended by Mallet & Vignoli (2007) who consider that both intensity and novelty “...are two distinct dimensions that do not belong to a single higher order trait...” (p. 2019).

In the future it will be important to carry out other studies with the AISS12, using it in association with more psychological instruments tapping relevant behavioural phenomena, in order to fully disclose which constructs the Sensation Seeking is consistently associated with. Also, the test-retest validity was not used in the studies which are included in this dissertation.

The evidence collected with the new inventory we constructed in order to measure Temporal Extension (the Temporal Extension Inventory of Coimbra) allows us to suggest the TEIC as a valid measure for investigators interested in studying the Temporal Extension concept and its overall impact on motivation and behaviour. When designing this instrument, one of our main goals was to develop a measure of Temporal Extension which is easy to use, score and interpret.

We recommend that, in the future, more items are created in each individual domain where extension is assessed, in both temporal frames (past and future). Even if it can be seen as arbitrary, based on our experience we believe that four items per dimension seems to be a good number of items to start with. The option for this number of items comes from the analysis of other successfully created subscales, like the Future Negative from the Time Perspective Scales (Janeiro, 2012), which presents a totally coherent set of correlations with other temporal dimensions, as well as a high internal

consistency. Additionally, it seems important to avoid the temptation to create a huge set of items in order to achieve a higher internal consistency and a greater amount of explained variance, since excessive long inventories bring several shortcomings which might threaten their validity, such as: participant fatigue, an excessive amount of time required to respond to all items and the extra effort which is often necessary for data collection in specific contexts.

Regarding the two control items (Items 4 and 11), we consider that the ones we included in this inventory did not fulfil their purpose, since several participants did not answer Item 4 *"I often think about my retirement which will take place in..."*, arguing that they never had thought about the retirement issue. It seems that the temporal extension required to think about retirement is out the temporal scope of the participants' forethoughts. Of course, this situation probably would not be a problem with older samples, in whom the temporal gap between their current situation and the retirement moment is shorter. But we must not forget that the intent of creating TEIC also requires the validity of all its components in a wide array of ages. Regarding Item 11 *"I remember my first day of primary school which took place in..."*, we believe that the answers given to this item are more dependent on the fact of being able to successfully recover past information (good memory skills) than on the exercise of a true attention control during the required task.

In relation to the results of the study presented in sub-chapter 1.4.3, we would like to underline two ideas: i) the Temporal Extension shows a moderate association with the Considerations of Future and Immediate Consequences,

concepts that have been quite successfully used in the explanation of several behaviours and cognitions, both on the functional and the dysfunctional side of a wide array of psychological phenomena. Following this line of studies, it would be of the utmost importance to test and use the TEIC in research studies carried out at various levels (e.g.: attitudinal, neuropsychological, vocational and personality); and ii) the negative signal regarding the correlation between Future Temporal Extension and Present Fatalist is expected, given the negative association between temporal dimensions respectively pertaining to the Future and the Present as previously reported by other researchers in the international context (Milfont & Gouveia, 2006; Zimbardo & Boyd, 1999).

Concerning our proposal for a new multidimensional model of Time Perspective, we believe that it does indeed represent a step forward regarding the structure of Time Perspective. Statistically the model presented good results, both at the exploratory and the confirmatory levels. Concerning its predictive value, the evidence obtained was inconclusive regarding some dimensions (as was the case with Temporal Extension), but in other dimensions such as Hope and Consideration of Future Consequences the results were fairly positive. However, some of the results obtained with the Consideration of Future Consequences were unexpected, since the temporal dimensions presented an important direct effect only on the immediate consequences, while the future dimension exerted only an indirect yet significant effect. Regarding Self-Esteem, this study brings an important contribution to the scientific literature about the association of Time Perspective with an important psychological phenomenon

such as Self-Esteem, but also sheds light on the predictive power of the former over the latter, using a robust statistical technique. From the several temporal dimensions tested, the ones expressing a negative valence were those presenting a greater role in the prediction of Self-Esteem. Taking into account the results that were obtained, we encourage researchers to consider Time Perspective as a relevant variable in the understanding of Self-Esteem.

The only dimension for which Time Perspective did not reveal any predictive power was Sensation Seeking. In a sense this result was somehow expected since this was the less “temporal” of the assessed dimensions, and the efforts undertaken are encouraging as they allow us to enquire a little further about the nature of the Sensation Seeking construct.

Regarding the stability of Time Perspective, the gathered evidence allows us to cautiously draw some preliminary conclusions. In fact, concerning both stability dimensions (the temporal and contextual stability) the results obtained point to the existence of small differences in all the temporal dimensions in the second wave of data collection, although the overall panorama agrees with the idea of global stability.

Yet, it is important to mention that, as far as contextual stability is concerned, future studies should consider using a more complete empirical design; for example, instead of a single direction assessment (such as the one that was used in this study), using the same group for both waves of data collection, although in different settings in time 1 and time 2, future studies



should collect the data using several groups/contexts both at time 1 and time 2. Future studies might also include group comparisons within a design allowing a multi-direction assessment, in other words, one group may be assessed first at home and then in college, while another group is assessed at both times in the opposite direction. These different combinations would allow researchers to obtain true comparative information among groups and situations, which will consequently improve our knowledge about Time Perspective stability.

We would like also to remark on the concept of Balanced Time Perspective, which although not yet fully and consensually operationalized, has an enormous potential in the promotion and maintenance of optimal functioning an individual and a societal level.

In sum, the present study allowed a better understanding of the nature, structure and correlates of Time Perspective. Nevertheless, from the evidence obtained, we consider that the scientific community should work in the development of measures focusing on other temporal dimensions which were not considered in this research project (e.g.: density, valence), and these efforts should be cumulative with previous findings in order to avoid one of the major pitfalls regarding the study of time, lack of coherence. Additionally, future projects should gather researchers from several nations in all the continents, in order to guarantee a multi-cultural approach to the study of temporal variables, and should also take into account the existence of domain-related temporal dimensions.

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# Appendices

## Appendix A

### Sociodemographic Questionnaire

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FPCEUC FACULDADE DE PSICOLOGIA  
E DE CIÊNCIAS DA EDUCAÇÃO  
UNIVERSIDADE DE COIMBRA



O presente questionário faz parte duma investigação científica integrada num doutoramento, sob a orientação da Prof.<sup>ª</sup> Maria Paula Paixão (FPCE-UP) e da Prof.<sup>ª</sup> Isabel Nunes Janeiro (FP-UL). O principal objectivo é avaliar a Perspectiva Temporal e a sua relação com outras características pessoais em diversas áreas de vida das pessoas.

Todos os dados recolhidos são completamente confidenciais e serão utilizados unicamente para fins de investigação. Tenha ainda em conta que a sua participação é de carácter voluntário, pelo que poderá recusar participar em qualquer momento.

Por favor leia com atenção todas as instruções e as perguntas e responda com a maior sinceridade possível. Na resposta aos diversos questionários tenha em mente que não existem respostas certas ou erradas.

Caso tenha alguma dúvida não hesite em perguntar à pessoa responsável.

O sucesso desta investigação depende da sua participação, a qual agradecemos desde já.

Caso deseje algum esclarecimento acerca desta investigação, poderá obtê-lo através da seguinte direcção de correio electrónico: **victortuno@gmail.com**

O investigador

Victor E. C. Ortuño  
Aluno de Doutoramento (FPCE-UC)

**1) Data**

\_\_\_\_\_ de \_\_\_\_\_ de \_\_\_\_\_

**2) Onde se encontra neste momento**Casa Trabalho Instituição de Ensino 

Outro: \_\_\_\_\_

**3) Género**Masculino Feminino **4) Idade e data de nascimento**

Anos

\_\_\_\_\_ de \_\_\_\_\_ de \_\_\_\_\_

**5) Freguesia de Nascimento**

\_\_\_\_\_

**6) Tem irmãos**Sim Não **6.1) Se sim, indique as idades e género de cada um**

Idade	Género		Idade	Género	
	Masculino	Feminino		Masculino	Feminino

**7) Estado civil**Solteiro(a) Casado(a) Divorciado(a)/Separado(a) Viúvo(a) União de Facto **8) Nível de habilitações**Ensino superior Formação pós-graduada 7.º, 8.º, ou 9.º ano de escolaridade 10.º, 11.º ou 12.º ano de escolaridade 4.º ano de escolaridade 5.º ou 6.º ano de escolaridade Não concluiu o 4.º ano de escolaridade **9) Situação profissional actual**A procura do 1.º emprego Empregado/Estudante Desempregado Reformado **10) Profissão** (se desempregado ou reformado colocar a última)

\_\_\_\_\_

**11) Curso e ano** (no caso de ser estudante)

\_\_\_\_\_

Ano

**11.1) Média do curso**

\_\_\_\_\_

**11.2) N.º de aluno** (no caso de ainda ser estudante)

\_\_\_\_\_

**12) Participa em alguma actividade de tempos livres** (ex.: desporto, associativismo ou outras)Sim Não



12.1) Se sim, qual

12.2) E com que frequência participa nela

- Todos os dias  2 ou 3 vezes por semana   
 1 vez por semana  1 vez por mês

13) Qual é a sua nacionalidade (se possui dupla nacionalidade, coloque as duas)

Portuguesa  Outra:

13.1) Se é estrangeiro, há quanto tempo reside em Portugal

ano(s) e  mês(es)

14) Qual é a sua doutrina religiosa

15) Indique 3 acontecimentos que tenham sido POSITIVOS para si no último ano

1)   
 2)   
 3)

15.1) Avalie qual o impacto destes 3 acontecimentos na sua vida

	Nenhum Impacto	Pouco Impacto	Algum Impacto	Bastante Impacto	Muito Impacto
Acontecimento Nº 1					
Acontecimento Nº 2					
Acontecimento Nº 3					

16) Indique 3 acontecimentos que tenham sido NEGATIVOS para si no último ano

1)   
 2)   
 3)

16.1) Avalie qual o impacto destes 3 acontecimentos na sua vida

	Nenhum Impacto	Pouco Impacto	Algum Impacto	Bastante Impacto	Muito Impacto
Acontecimento Nº 1					
Acontecimento Nº 2					
Acontecimento Nº 3					

Com o intuito de conseguir informações mais detalhadas e precisas, é necessário que responda a algumas partes deste questionário novamente. **Só assim esta investigação poderá atingir os seus objectivos.** Assim, caso esteja disponível para participar mais uma vez neste estudo, escreva nos espaços seguintes um ou mais dos seus contactos de correio electrónico.


Muito obrigado pela sua participação!

## Appendix B

### Portuguese Zimbardo Time Perspective Inventory – ZTPI

Teste Nº: \_\_\_\_\_

Zimbardo Time Perspective Inventory Revisto – ZTPI-R  
Zimbardo P. & Boyd J. (1999), tradução de Ortuño, V. & Gamboa, V. (2009)

Leia cada afirmação e responda o mais sinceramente possível à pergunta:  
Em que medida esta afirmação é verdadeira para si.  
Para cada item assinale de acordo com a escala. Por favor responda a **TODAS** as questões.

1 = Nada; 2 = Pouco; 3 = Nem muito nem pouco; 4 = Muito; 5 = Totalmente		1	2	3	4	5
1.	Acredito que ir sair com os amigos é um dos prazeres da vida de uma pessoa.					
2.	As imagens, os sons e os cheiros da minha infância trazem-me lembranças maravilhosas.					
3.	O destino determina muito da minha vida.					
4.	Muitas vezes penso naquilo que deveria ter feito de forma diferente na minha vida.					
5.	As minhas decisões são na sua maioria influenciadas pelas pessoas e coisas à minha volta.					
6.	Acredito que o dia de cada pessoa deve ser planeado com antecedência todas as manhãs.					
7.	Dá-me prazer pensar sobre o meu passado.					
8.	Faço coisas impulsivamente.					
9.	Se as coisas não ficam feitas a tempo, não me preocupo com isso.					
10.	Quando quero alguma coisa, estabeleço objectivos e penso em meios específicos para atingir esses objectivos					
11.	Fazendo um balanço, há mais memórias boas do que más para recordar no meu passado.					
12.	Quando estou a ouvir a minha música favorita, perco frequentemente qualquer noção do tempo.					
13.	Cumprir os prazos para amanhã e fazer qualquer outro trabalho necessário vem primeiro do que a diversão de hoje à noite.					
14.	Não importa realmente aquilo que eu faça, uma vez que o que tiver de ser, será.					
15.	Gosto de histórias sobre como as coisas costumavam ser nos «bons velhos tempos».					
16.	Continuo a reviver no meu pensamento as experiências dolorosas do passado.					
17.	Tento viver a minha vida o melhor possível, um dia de cada vez.					
18.	Aborreço-me chegar atrasado a compromissos.					
19.	Para mim o ideal seria viver cada dia como se fosse o último.					
20.	Penso frequentemente em memórias felizes de bons tempos.					
21.	Cumpro a tempo as minhas obrigações relativamente a amigos e instituições.					
22.	No passado, tive a minha dose de maus-tratos e rejeição.					
23.	Tomo as minhas decisões de acordo com a inspiração do momento.					
24.	Prefiro aceitar cada dia como ele é, em vez de tentar planeá-lo.					
25.	O passado traz-me demasiadas más memórias, nas quais eu prefiro não pensar.					
26.	É importante conseguir emoção na minha vida.					
27.	Cometi erros no passado que desejava poder desfazer.					
28.	Sinto que é mais importante gostar daquilo que se está a fazer do que ter o trabalho concluído a tempo.					
29.	Fico nostálgico acerca da minha infância.					

1 = Nada; 2 = Pouco; 3 = Nem muito nem pouco; 4 = Muito; 5 = Totalmente		1	2	3	4	5
30.	Antes de tomar uma decisão, peso os custos e os benefícios.					
31.	Correr riscos evita que minha vida se torne aborrecida.					
32.	É mais importante para mim tirar prazer no decorrer da vida do que focar-me apenas na meta final.					
33.	As coisas raramente correm como eu esperava.					
34.	É difícil para mim esquecer imagens desagradáveis da minha juventude.					
35.	Se tenho que pensar nos objectivos, resultados e produtos das minhas actividades, isso tira-me o prazer e estraga o decorrer do processo.					
36.	Mesmo quando estou a gostar do presente, sinto-me impellido a fazer comparações com experiências passadas semelhantes.					
37.	Não se consegue fazer planos para o futuro porque as coisas mudam demasiado.					
38.	O meu percurso de vida é controlado por forças sobre as quais eu não tenho influência.					
39.	Não faz sentido preocupar-me com o futuro, uma vez que não há nada que eu possa fazer acerca dele.					
40.	Completo projectos dentro do prazo concretizando etapa a etapa.					
41.	Quando familiares começam a falar de como as coisas eram antigamente eu desinteresse-me da conversa.					
42.	Corro riscos para sentir emoção na minha vida.					
43.	Faço listas daquilo que tenho para fazer.					
44.	Frequentemente sigo mais o meu coração do que a minha cabeça.					
45.	Consigo resistir a tentações quando sei que há trabalho que precisa ser feito.					
46.	Deixo-me levar pela emoção do momento.					
47.	A vida de hoje em dia é demasiado complicada; preferia a vida simples de antigamente.					
48.	Prefiro que os amigos sejam espontâneos em vez de previsíveis.					
49.	Gosto dos rituais e tradições familiares que são repetidos com regularidade.					
50.	Penso acerca das coisas más que me aconteceram no passado.					
51.	Continuo a trabalhar nas tarefas difíceis e desinteressantes se estas me ajudarem a progredir.					
52.	Gastar aquilo que ganhei, nos prazeres de hoje, é melhor do que poupar para a segurança de amanhã.					
53.	Frequentemente, a sorte resulta melhor do que o trabalho árduo.					
54.	Penso acerca das coisas boas que eu perdi ao longo da minha vida.					
55.	Gosto que os meus relacionamentos próximos sejam intensos.					
56.	Haverá sempre tempo para recuperar o trabalho em atraso.					

## Appendix C

### *Portuguese Transcendental Future Time Perspective Scale – TFTPS*

#### Transcendental-Future Time Perspective Scale – TFTPS

Boyd, J. & Zimbardo, P. (1997). Tradução de Ortuño, V., Paixão, M., & Janeiro, I. (em publicação)

Leia cada afirmação e responda o mais sinceramente possível à pergunta: Em que medida esta afirmação é verdadeira para si. Por favor responda a **TODAS** as questões utilizando a seguinte escala:

**1** = Nada

**2** = Pouco

**3** = Nem muito nem pouco

**4** = Muito

**5** = Totalmente

		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1.	Só o meu corpo físico irá alguma vez morrer.					
2.	O meu corpo é apenas uma habitação temporária para o meu verdadeiro eu.					
3.	A morte não é mais do que um novo começo.					
4.	Acredito em milagres.					
5.	A teoria da evolução explica adequadamente como é que a espécie humana apareceu.					
6.	Os seres humanos possuem uma alma.					
7.	As leis científicas não conseguem explicar tudo.					
8.	Serei responsabilizado pelas minhas acções na terra quando morrer.					
9.	Há leis divinas pelas quais os seres humanos deveriam guiar a sua vida.					
10.	Acredito em espíritos.					

## Appendix D

### Portuguese Arnett Inventory of Sensation Seeking – AISS

#### Arnett Inventory of Sensation Seeking – AISS

Arnett, 1994. Tradução de Ortuño, Paixão & Janeiro (sem publicar)

Indique com um X para cada item, qual a resposta que melhor se aplica a si:

- 1 = Não me descreve de todo  
 2 = Não me descreve muito bem  
 3 = Descreve-me mais ou menos  
 4 = Descreve-me muito bem

		1	2	3	4
1.	Consigno ver que poderia ser interessante casar com alguém de um país estrangeiro.				
2.	Quando a água está muito fria, prefiro não nadar mesmo que o dia esteja quente.				
3.	Se tiver de esperar numa fila comprida normalmente sou paciente.				
4.	Quando oiço música gosto que esteja alta.				
5.	Quando viajo acho que é melhor planear o menos possível e deixo as coisas correr por si.				
6.	Não vejo filmes quando as pessoas dizem que são assustadores ou têm muito suspense.				
7.	Acho divertido e emocionante actuar ou falar perante um grupo.				
8.	Se fosse a um parque de diversões, preferiria andar na montanha russa ou noutras atracções com velocidade.				
9.	Gostaria de viajar para lugares desconhecidos e longínquos.				
10.	Não gostaria de jogar a dinheiro mesmo que tivesse possibilidades financeiras para o fazer.				
11.	Gostaria de ter sido um dos primeiros exploradores de uma terra desconhecida.				
12.	Gosto de filmes com muitas explosões e perseguições com carros.				
13.	Não gosto de comidas extremamente picantes e com muitas especiarias.				
14.	Normalmente trabalho melhor sob pressão.				
15.	Costumo ter a rádio ou a televisão ligada enquanto faço outra coisa, tal como ler ou fazer limpezas.				
16.	Seria interessante assistir a um acidente de carro.				
17.	Acho que é melhor pedir qualquer coisa que já conheça quando vou comer a um restaurante.				
18.	Gosto da sensação de estar perto da berma de um sítio alto enquanto olho para baixo.				
19.	Se fosse possível visitar de graça outro planeta ou a lua eu estaria entre os primeiros interessados.				
20.	Compreendo como pode ser emocionante estar numa batalha durante uma guerra.				
		1	2	3	4

## Appendix E

### Temporal Extension Inventory of Coimbra – TEIC

#### Inventário de Extensão Temporal de Coimbra – IETC

Ortuño, V., Paixão, M. P. & Janeiro, I. (sem publicar)

Em seguida são apresentadas 14 afirmações relativas ao seu futuro e ao seu passado. Por favor em cada afirmação marque um **X** na opção que o descreva melhor. Tenha em conta que não existem opções certas ou erradas, agradecemos que seja o mais sincero possível.

		2 Meses ou menos	6 Meses	1 Ano	3 Anos	5 Anos	10 Anos	20 Anos ou mais
1.	Tenho por habito pensar como será a minha vida daqui a							
2.	No que respeita à minha profissão, sei onde quero estar daqui a							
3.	Costumo pensar em que tipo de relação e com que tipo de pessoa estarei nos próximos							
4.	Penso frequentemente na minha reforma que será daqui a							
5.	É normal pensar em qual será o meu trabalho daqui a							
6.	É habitual da minha parte fazer planos ou delinear projectos para os próximos							
7.	Usualmente imagino como serão as minhas relações nos próximos							
8.	Penso regularmente em assuntos ou acontecimentos dos últimos							
9.	É com alguma frequência que relembro os trabalhos que tive nos últimos							
10.	Tenho presente no meu pensamento pessoas com as quais convivi nos últimos							
11.	O meu primeiro dia de escola primária foi há							
12.	Recordo com frequência as decisões que tomei nos últimos							
13.	Relembro com frequência assuntos que ocorreram no meu trabalho nos últimos							
14.	Consigo lembrar-me facilmente de ocasiões que vivi com outras pessoas nos últimos							

