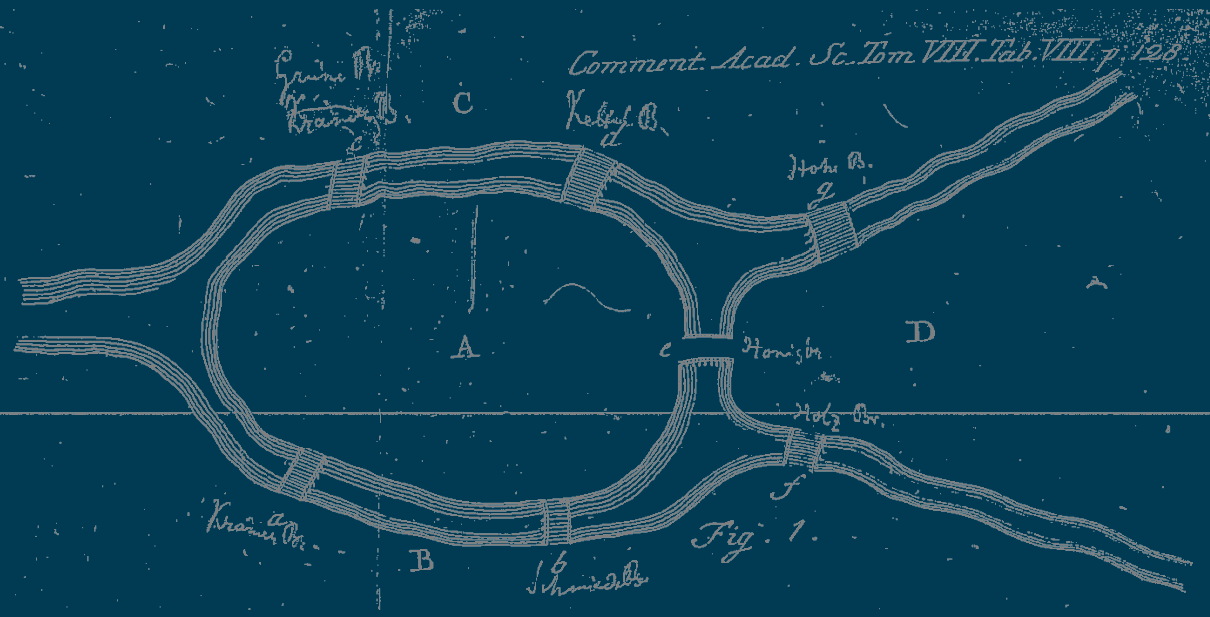
INTERNATIONAL STUDIES IN TIME PERSPECTIVE

MARIA PAULA PAIXÃO
JOSÉ TOMÁS DA SILVA
(COORD.)
VICTOR ORTUÑO
PEDRO CORDEIRO
(EDITORS)



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Preface

This book integrates several papers which were presented on the "*Ist International Conference on Time Perspective – Converging Paths in Psychology Time Theory and Research*", that took place 5-8 September 2012, at the University of Coimbra. Being the first, we hope it to be a milestone in highlighting the effort spent by different psychological approaches to understand the role played by time concepts in individual, group, and organizational development.

The Conference was jointly organized by the "Instituto de Psicologia Cognitiva, Desenvolvimento Vocacional e Social" (Institute for Cognitive Psychology, Vocational and Social Development), a R & D unit based at the University of Coimbra, and the "Groupe de Recherche en Psycologie Sociale – GrePS", a R&D unit based at the University of Lyon, France. It was hosted by the Faculty of Psychology and Education of the University of Coimbra (Portugal), the oldest University in Portugal (its foundation goes back to 1290), and an institution for which the notions of a rich past history and future strategic planning constitute the cornerstones of today's concerns. In a moment in time where the past, the present and the future are intensively invested with meaning and intention, researchers coming from all over the world reflected on how time perspectives impact on our lives, from our more proximal to our most distal socio-ecological contexts. It reunited more than 300 participants coming from 42 countries spread all over the 5 continents.

During three intense but exciting days, senior and junior researchers exchanged and questioned emerging and well established concepts, reflecting upon diverse and joint projects, and prepared the path for future developments.We can undoubtedly say that the organization of this conference was a timely one, once there has lately been a renewed interest, as well as a series of academic initiatives, dedicated to the understanding of specific aspects of individual, group, and social behavior through the study of its core temporal dimensions.

The study of subjective temporality or Time Perspective (TP) has been going on since K. Lewin defined it as "the totality of the individual's view of his psychological future and psychological past existing at a given time" (1951, p. 75), and it has encompassed several topics in various psychological domains. The chapters that are included in this book are a good illustration of the multifaceted focus on the research of subjective time in the psychological science. Taking this diversity into account, the editors opted to organize the contributions into six parts, corresponding to the following broad scientific domains:

Part 1 – Time Perspective and human development: adaptive functioning and risk behaviors across the life-span. This part includes 8 chapters presenting the role played by TP, both in the normative developmental path from birth to death and in more deviant patterns of behavioral functioning in childhood, adolescence and adulthood.

Part 2 – The relationships of personality and affective processes with Time Perspective, includes 4 chapters that address the relations among psychological personality traits and more dynamic affective processes with several subjective temporality dimensions.

Part 3 – Time Perspective, health and well-being, includes 5 chapters where researchers try to uncover the impact of TP in the promotion of healthy life styles and in the prevention of disease and ill-being.

Part 4 – The role played by Time Perspective in career and vocational development, also comprising 4 chapters, addresses the role of important subjective time dimensions in career and vocational developmental paths throughout life.

Part 5 – Time Perspective in education and learning, includes 3 chapters that focus primarily on future orientation issues which try to grasp the role played by cognitive motivation constructs in learning and academic achievement, in children and adolescence.

Finally, Part 6 – Measurement and emerging topics in Time Perspective, with 6 chapters, sheds a light on important aspects concerning the development of reliable and valid measures of time psychological latent variables, starting also to address innovative possibilities for future research.

As editors, we would like to express our gratitude to our key speakers, Professors Philip Zimbardo (Stanford University, USA), Willy Lens (University of Leuven, Belgium), Mark Savickas (Northeastern Ohio Medical University, USA) and Jenefer Husman (Arizona State University, USA) for having believed in this initiative and having supported it from the very beginning. They are outstanding researchers who have opened converging paths in the study of psychological time theory and research and who stay committed to its continuous improvement. We would also like to underline the enormous generosity of a young group of researchers (doctoral students and research assistants) affiliated with the IPCVDS, who dedicated a lot of their time and "endless" effort and energy to the preparation of this conference, taking care of all the details necessary for the scientific and the organizing committees to come up with a final program. We finally address our special thanks to an incredible group of volunteers, totally constituted by students of the integrated master in psychology in both the Universities of Coimbra and Lisbon, whose enthusiasm for learning and sharing led them to begin their academic year two weeks earlier than their colleagues.

We hope that this book is able to nourish the next wave of researchers on psychological time concepts, encouraging them to pursue and renovate the theory, the research efforts and the practical applications in this exciting field of psychological enquiry.

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The Editors

Maria Paula Paixão (Coord.)
José Tomás da Silva (Coord.)
Victor Cabrita Ortuño
Pedro Miguel Cordeiro

PART 1

TIME PERSPECTIVE AND HUMAN DEVELOPMENT: ADAPTIVE FUNCTIONING AND RISK BEHAVIORS ACROSS THE LIFE-SPAN

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Chapter 1

"Start thinking what are you going to be when adult!" The relationship between parental time orientation and the emergence of episodic foresight in preschool aged children

Alejandro Vásquez
Faculty of Psychology and Educational Sciences, University of Porto, Portugal
Faculty of Psychology, University of the Republic, Uruguay
avasquez@psico.edu.uy

Orlanda Cruz
Faculty of Psychology and Educational Sciences, University of Porto, Portugal

Abstract: In this paper we explore the role of parental time orientation in the development of episodic foresight (EF), defined as the ability to project the self to the future. It is known that some personality traits of parents are transmitted to children and also that linguistic and stimulation background could be related to cognitive outcomes in the child. Traditionally, intergenerational transmission of cognitive skills has shown stronger effects than non-cognitive skills. Despite this, little is known about how this process works in the case of temporal cognition, and specifically, how parents' temporal orientation can be related to the emergence of EF in early childhood. Across two studies, we experimentally assessed 3- and 4- years-old children on measures of EF and their mothers´ time orientation. In study 1, we used the Spanish version of the Considerations of Future Consequences Scale (CFC) and in Study 2, the Portuguese version of the Zimbardo Time Perspective Inventory (ZTPI). Results showed significant, medium-range and negative first order correlations (controlling for age in months) between present orientation scales and the score of EF across the 2 studies. In Study 1, higher levels of Immediate CFC correlate negatively to EF as in Study 2 Present Fatalism and Present Hedonism does. These results suggest that parental present orientation is associated to inter-individual differences on EF between preschoolers, but not –counter intuitively- with future orientation scales.

Keywords: episodic foresight, time perspective, consideration of future consequences, intergenerational transmission.

Introduction

In this presentation we explore the role of parental time perspective in the development of episodic foresight (EF). EF has been defined as the ability to project the self in time to pre-experience an event and anticipate future needs, desires and mental states (Atance & Meltzoff, 2005, Atance & O'Neill, 2001). In this sense, it was proposed to be the counterpart of episodic memory in a more general capacity of thinking about personally relevant events, i. e., autonoetic consciousness (Suddendorf & Moore, 2011). Research

on the development of episodic foresight despite recent, is soaring in the cognitive-developmental literature (Atance, 2008).

Intergenerational transmission

It is known that cognitive (e.g. general and fluid intelligence) and non-cognitive skills (e.g. personality traits, Locus of Control, aggressive behavior) are subject of transmission from one generation to other. Traditionally, intergenerational transmission (IT) of cognitive skills has shown stronger effects than non-cognitive skills. For instance, cognitive skills show a range in the correlations from one generation to other that goes from moderate to high coefficients with *r* values ranging from .42 to .72 in the case of the IQ (see for example Anger & Heineck, 2010). With some non-cognitive skills the range is weak to moderate, though positive and significant in several cases with ranges from .10 to .30 for personality traits, for example (Anger, 2012). Research results consistently show the IT of socio-economic status, educational achievement, health-risk behaviors, problem/externalizing behavior, aggression and parenting styles (see for example Serbin & Karp, 2004), so IT can be considered a common process in psychological and psycho-social research.

Despite this, little effort was been done to explore how the IT process works in the case of temporal cognition, and specifically, if there is any influence of the parental time orientation on the early emergency of temporal skills of the child.

This study

Our objective is to explore existence and extent of a process of IT of temporal processes between mothers and their preschool aged children. We want to answer these questions: Parents' temporal orientation can be related to the emergence of EFT in early childhood? Is it possible the intergenerational transmission from a cognitive-motivational (time orientation) skill to a cognitive one (emergence of the ability to foresee the personal future)? We reason that the time orientation and importance each parent gives to time frames will influence modeling education, actions and conversations about time, and in turn, that will be stimulating or nor the temporal thinking of the child about his/her personal future. In this line of thought, we hypothesize that children with more present-oriented parents will have lower scores of EF. At the same time, children with more future oriented parents will show higher scores of EF.

STUDY 1

Method

Participants

Sixty-four mothers and their 4-years-old children participating in a wider study took part in the experiments. Participants came from Montevideo (Uruguay) city or metropolitan area and were from different socio-economic backgrounds.

Instruments

Mother temporal orientation.

To assess Mother's consideration of future consequences. We used the Consideration of Future Consequences Scale. The CFC scale has good psychometric properties in its English version (Strathman, Gleicher, Böninger, & Edwards, 1994) and its concurrent validity has been demonstrated consistently in various domains of behavior. This scale is composed of 12 items, which are evaluated using a 7-point Likert scale. In the global CFC Scale higher numbers indicate a greater consideration of future consequences. Two sub-scales have been identified, Immediate (CFC-I), which reflect the importance of immediate consequences of actions, and Future (CFC-F) which reflect the important given to distant outcomes of behavior. The CFC- Immediate sub-scale items are reverse-scored for a general CFC score. We used the Spanish version developed by Vasquez et al. (submitted.).

To assess Children's Episodic Foresight. To assess EF in children two tasks were used (a) the pictured trip task (Atance & Meltzoff, 2005), (b) the draw task (Atance & O´Neill, 2005). We used the weighted mean for creating the composite score used in the analyses.

Procedure

Mothers were recruited from educative centers that accepted to participate in the study. All ethical procedures were considered. After the work with the child in a quiet room of the pre-school center, the CFC questionnaire was sent to the mothers that returned it between one day and one week after.

Results & Discussion

Pearson partial correlations (controlling for age in months) between the CFC total score and EF composite score were .32, $p < .05$. Considering the sub-scales, the correlation of the EF-composite score with the CFC-F was .11, n. s., and with the CFC-I was -.33, $p < .01$. This suggests that the effect of the CFC global score is due by the sole contribution of the CFC-I (the positive correlation is because to compute the sub-scale score no reversion is needed). The more weight given by the mother to the immediate consequences of action, lower scores in EF will present the child.

STUDY 2

Method

Participants

Ninety mothers and their pre-school aged children (3 and 4 years old) participating in a wider study completed the experiments and measures. Mothers came from Porto and Northern Portugal area and were from different socio-economic backgrounds.

Instruments

To assess Mother's time perspective. We used the *Zimbardo Time Perspective* In*ventory – ZTPI* (Zimbardo & Boyd, 1999), specifically the Portuguese adaptation of Ortuño & Gamboa (2009). This inventory is composed of 56 items (5-point Likert scale) which represents 5 temporal dimensions: 1) Past Positive, related to pleasant and warm attitudes towards the past (α = .68, 9 items), 2) Past Negative, represents an aversive and distressful attitude towards the past (α = .80, 10 items), 3) Present Hedonist, represents a tendency to seek immediate pleasure, through exciting and risky experiences (α = .79, 15 items), 4) Present Fatalist, shows a defeatist attitude towards life (α = .66, 9 items) and 5) Future, indicates a strong tendency to create and pursue long term objectives (α = .74, 13 items).

To assess Children's Episodic Foresight. We used three measures of EF; two of them were identical to those used in Study 1 (pictured trip task and the draw task) and we included the blow football task in this battery for more consistency of the measure (Russell, Alexis, Clayton, 2010). Factor score of the three measures was used as the score of the child EF.

Results & Discussion

In Table 1 we present the main correlational analyses. We again controlled for age in month due to the variability in ages that can affect maturation. Results shows a pattern were Present sub-scales (Hedonistic and Fatalistic) show stronger association, while Fatalistic it is more strong and significant. This should be interpreted as more present oriented (more fatalistic of hedonistic the parents) lower score had the child in the EF measures. The other sub-scales did not showed statistically significant values.

Table 1 – *Partial correlations (controlling for age in months) between EF and the ZTPI sub-scales*

ZTPI Sub-scales	**Child EF**
Past-Negative	-.16
Past-Positive	-.09
Present-Hedonistic	-.23*
Present-Fatalistic	-.30**
Future	.15

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

General Discussion

The overarching objective of this paper was to explore the possible contribution of the parental time perspective in the development of episodic foresight. To achieve that objective we presented two studies that explored two different constructs related to time orientation, namely the consideration of future consequences and the time perspective in mothers, and the episodic foresight in their pre-school children.

Interestingly, in both studies parental present orientation scores, represented by the scores in the sub-scales CFC-I in Study 1 and ZTPI present fatalistic and present hedonism sub-scales explains part of the inter-individual differences on the acquisition of the EF between preschool aged children. In both cases, correlation coefficients between parental time perspective and the development of episodic foresight are somewhat higher than those of non-cognitive skills, presented in literature. Notably, none of the other sub-scales scores explained variance on the EF development. This suggests that impulsiveness/present orientation of parents delay the emergence of the cognitive capacity for thinking in the personal future.

How to explain this pattern of results? While the genetic account cannot be disregarded until we have more research about this issue, we reason that parental modeling is the main cause. More present-oriented parents act in a more impulse way, talk more about the present and weight more the immediate consequences of behavior, not inducing the child to engage in distancing behaviors of the present. Intriguingly, no significant effect was shown by future oriented scales (CFC-F and ZTPI – Future), so further research is needed to explain this results.

Finally we think that our results open an interesting avenue of research for future studies exploring the intergenerational transmission of time perspective, consideration of future consequences and other temporal processes.

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Chapter 2

Developmental change of orientations to self-change during adolescence

Chishima Yuta
Graduate school of comprehensive human sciences, University of Tsukuba, Japan
chishima@human.tsukuba.ac.jp

Abstract: The purpose of this study was to examine developmental changes in orientations to self-change in adolescence, focusing on early, middle, and late adolescents. Although it is well known that many adolescents want to change themselves, few studies have examined how orientations to self-change evolve during adolescence. A total of 1,128 Japanese adolescents aged 13 to 25 (353 junior high school students, 375 high school students, and 400 university students) responded to an orientations to self-change scale consisting of 40 items. Results of a factor analysis indicated that the orientations to self-change consisted of 10 factors. A principal component analysis of the 10 factors resulted in a distribution along two axes: Future Selves--Past Selves and Positive Others--Negative Selves. Results of ANOVA comparing 10 scores with 3 school stages indicated that the orientations to self-change could evolve through three stages in adolescence. At first, adolescents want to change all of themselves, then they tend to refer to their past selves and current others in changing themselves as they grow, and finally they reach the stage of referring to future selves, so that they want to improve specific aspects of themselves.

Keywords: developmental change, orientations to self-change, self, adolescence.

Introduction

Many people are eager to rebuild themselves, especially in adolescence (Hatase, 2000; Mizuma, 2003). Heretofore, concepts relating to intentional self-change that have been examined, for example, "self-improvement motivation" (Taylor, Neter, & Wayment, 1995) and "possible selves" (Markus & Nurius, 1986). Chishima (2012) suggested the concept of Orientations to Self-Change (OSC) to organize concepts related to intentional self-change. Then, how do OSC develop during adolescence? Boyatzis (2006) proposed Intentional Change Theory, which describes the process from finding the ideal self to the achievement of self-change. Kiecolt (1994) also developed a model in which the impetus for intentional self-change could be provided by a stressor-chronic role strain, a life event, or both. However most of these studies have focused on addictive behaviors and haven't taken into account adolescent development.

Method

Participants

Participants were 1,128 adolescents aged from 13 to 25 years, including 353 junior high school students as early adolescents, 375 high school students as middle adolescents, and 400 university students as late adolescents (Table 1).

Table 1 – *Characteristics of participants*

	Early Adolescents	Middle Adolescents	Late Adolescents	Total
Men	178	185	156	519
Women	174	187	242	603
Gender non-respondents	1	3	2	6
Total	353	375	400	1128
Mean age	13.47	15.92	20.35	16.72
(SD)	(1.19)	(1.35)	(2.12)	(3.29)

Measures

The orientations to self-change scale by Chishima (2012) was used. Participants were asked "To what extent do the following items apply to you?" Each item used a five point Likert-type scale ranging from "does not apply at all" (1) to "applies exactly" (5), with higher scores reflecting stronger orientations toward self-change.

Procedures

The research was conducted from September to October in 2011. The questionnaires were distributed to the participants and picked up during classroom time.

Results

Results of a factor analysis with only the university students' data indicated that the orientations to self-change items contained 10 factors. These factors were named based on the items with high factor loadings. The mean of the scores on the OSC were calculated for items with over .40 factor loadings. Then, using the same items as for the university students, the scores for the junior high and high school students were calculated. Table 2 shows the statistics and example items of the OSC.

Next, a principal component plot of the OSC scores was made to understand the characteristics of the 10 scores in detail. In Figure 1, on the horizontal axis, the F1 Nostalgia score was highest, and the F10 Improvement score was lowest, whereas on the vertical axis, the F3 Adoration was highest, and the F7 Renewal was lowest. Therefore the horizontal axis was interpreted as the Future Selves – Past Selves axis. The vertical axis was interpreted as the Positive Others – Negative Selves axis.

Table 2 – *Statistics and example items in 10 orientations to self-change*

Factor names	Mean (1 to 5)	(SD)	α	Example items
F1 Nostalgia orientation	2.24	(0.91)	.89	I want to get back my former self.
F2 Foresight orientation	3.76	(0.88)	.84	When I think of my future, I don't want to continue being what I am today.
F3 Adoration orientation	3.47	(0.94)	.83	I want to change myself to be like others whom I adore.
F4 Change-seeking orientation	2.90	(0.91)	.83	I constantly want to change.
F5 Personableness orientation	3.64	(0.95)	.87	I want to change to get applause from others.
F6 Rebirth orientation	2.65	(1.07)	.88	I want to make over all of me.
F7 Renewal orientation	3.30	(0.95)	.83	I want to renew myself because I am not making any progress.
F8 Imitation orientation	2.34	(0.83)	.77	I want to change myself by imitating people I'm familiar with.
F9 Discovery orientation	3.15	(1.00)	.81	I want to change myself to find my true self.
F10 Improvement orientation	4.28	(0.69)	.72	I want change my bad points.

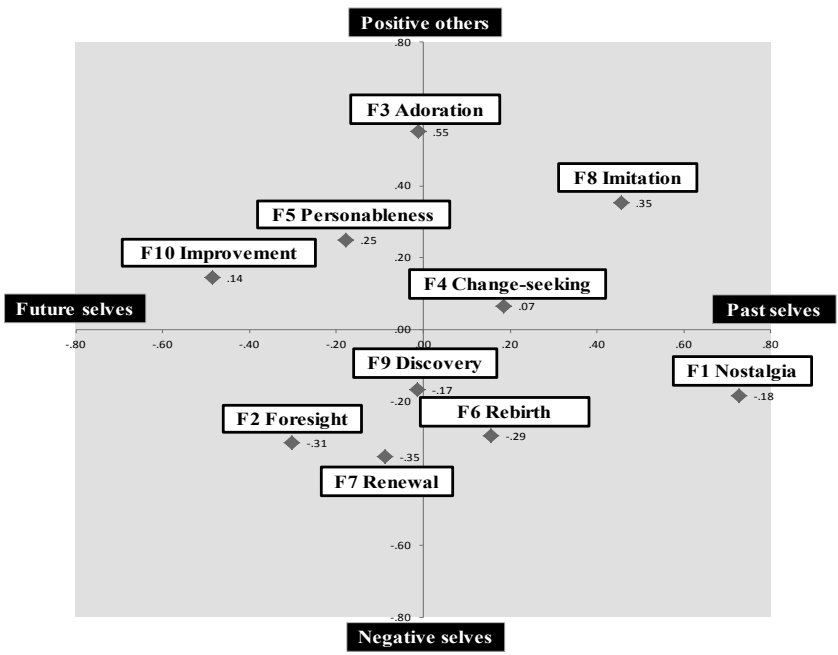

Figure 1. *Principal component plot of scores in 10 orientations to self change.*

Note. Second component loadings were plotted on the horizontal axis and third component loadings were plotted on the vertical axis.

An analysis of variance was conducted to compare the 10 OSC scores with each school stage (Table 3). The results of multiple comparisons using Tukey's HSD test ($p < .05$) indicated that the F6 Rebirth scores for the junior high and high school students were higher than for the university students. The F1 Nostalgia scores and the F5 Personableness scores for high school students were higher than for junior high school and university students. The F7 Renewal scores for high school students were higher than for junior high school students. The F2 Foresight scores and the F10 Improvement scores for high school students and university students were higher than for junior high school students. The F4 Change-seeking scores increased as students got older.

Table 3 – *ANOVA results of OSC scores of between three school stages*

	Early Adolescents	Middle Adolescents	Late Adolescents	*F* Value	Multiple comparison
	n =353	*n* =375	*n* =400		
F6 Rebirth	2.67 (1.08)	2.81 (1.08)	2.48 (1.02)	9.32 ***	L<E,M
F1 Nostalgia	2.19 (0.83)	2.41 (0.99)	2.13 (0.89)	10.13 ***	E,L<M
F5 Personableness	3.57 (0.96)	3.76 (0.92)	3.59 (0.94)	4.50 *	E,L<M
F7 Renewal	3.18 (0.92)	3.41 (0.91)	3.31 (0.99)	5.69 **	E<M
F2 Foresight	3.59 (0.94)	3.77 (0.88)	3.89 (0.81)	10.97 ***	E<M,L
F10 Improvement	4.08 (0.77)	4.36 (0.64)	4.38 (0.62)	21.58 ***	E<M,L
F4 Change-seeking	2.62 (0.86)	2.93 (0.89)	3.11	28.94 ***	E<M<L

Note 1. The significantly higher scores were shaded.
Note 2. The scores of OSC were reordered based on results of multiple comparison.
Note 3. E:Early Adolescents; M:Middle Adolescents; L: Late Adolescents.
Note 4. *p<.05,**p<.01,***p<.001

Discussion

The results of a comparison of OSC scores among three school stages suggest that orientations to self-change evolve through the three stages.

First, for early adolescents, is the stage of self-change orientation referring to the whole selves. This stage shows higher the F6 Rebirth scores in junior high and high school students. Early adolescents haven't yet developed cognitive skills for objectivizing themselves or imaging the future. Therefore they want to change all of themselves. The second stage, regarding middle adolescence, is the stage referring to past selves/positive others. This stage shows the F1 Nostalgia scores, the F7 Renewal scores, and the F5 Personableness scores higher in junior high school students. Middle adolescents tend to show a past orientation, and be nervous about gaining esteem from others. Therefore they tend to want to change themselves to be the former selves and to get the approval of current others. Third is the stage referring to future selves. This stage shows the F2 Foresight scores, the F4 Change-seeking scores, and the F10 Improvement scores higher in high school and university students. Late adolescents are motivated to improve their bad points for the future.

In the light of the above findings, developmental change in the orientations to self-change during adolescence could be summarized as follows. At first, adolescents want to change all of themselves, then they tend to refer to their past selves and current others in changing themselves as they grow, and finally they reach the stage of referring to future selves, so that they want to improve specific aspects of themselves.

For future research, the extent to which they actualize self-change (cf. Polivy & Herman, 2002) needs to be examined.

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Chapter 3

Self as future: vocational life-narratives and identity exploration in adolescence

Paulo R. Jesus
University of Lisbon, Portugal
paulorenatus@gmail.com

Abstract: In this paper, we analyze the structuring role played by the subjective construction of future life-scenarios and storied self-images in the process of identity formation and vocational definition during adolescence. Our empirical data consist mainly of autobiographical narratives and oral discussion of moral and religious dilemmas collected through an adapted version of Dan P. McAdams Life Story Interview from a cross-sectional sample of 31 Portuguese adolescents. In addition to the narrative interview, the participants were invited to imagine and further elaborate on their desired future lives, thus describing and illustrating their conception of "good life" (or optimal psychosocial functioning). The results show that vocational and identity achievement motivation relies strongly on the dialectic and dialogical tension between contrasting grammars of prospective stories that enact the most likely possible selves and the most desirable selves or "imagined best selves". The mindscape of perceived or constructed future selfhood gives structure and dynamism to the subjects' self-exploration initiatives and supports the hypothesis that the meaningful activity of self-futuring is the master cognitive and emotional process in the generation of psychological time, existential direction and personal unity.

Keywords: possible selves, narrative identity, vocational exploration, at-risk youth, time perspective.

Introduction

Narrative and Dialogical Identity

Drawing from the concept of future "possible selves" (Markus & Nurius, 1986), our research proposes that the generation of possible selves tends to occur predominantly in narrative mode and that idiosyncratic compounds of narrative possible selves embody imaginative self-simulations in which the meaningful content, attentional focus and emotional valence of one's own constructed futures translate into engagement in concrete courses of action. Furthermore, we assume in keeping with K. Gergen (1992, 1994, 2009) that self-narratives are webs of relationships and relational symbolic co-constructions crafting and expounding one's multi-being. From a temporal perspective (Nuttin & Lens, 1985; Paixão, Abreu & Lens, 2012; Zimbardo & Boyd, 1999), life-scenarios on future possible selves offer an evaluative and interpretive key to read both past and present experience; to such an extent that we consider future possible selves, with their underlying feed-forward self-concern, to be the psychological origin of subjective time. Given the

importance of abstract and hypothetical reasoning combined with an intensive focus on self-identity (McLean, 2005; McLean & Pasupathi, 2010; Oyserman & Fryberg, 2006), the self-futuring process gains momentum in the course of adolescence, and overlaps, at least partly, what Savickas et al. (2009) call "life designing", in the realm of vocational psychology.

We maintain as a general theoretical hypothesis that adolescent "identity crisis" (Erikson, 1968) and "ego-identity statuses" (Marcia, 1966) may be interpreted in narrative terms. The "identity crisis" might then be construed as a developmental task that consists in exploring the psychosocial meaning of future possible life stories, prior to making a stable commitment to a specific ideological and socio-behavioral self-narrative system. The stage of moratorium is expected to display an unstable relationship of tentative identification between the narrators and the protagonists of future possible selves, corresponding to varied modes of self-experimentation and oscillating degrees of self-uncertainty that produce abundant episodic narrative fragments gradually unified in an overall net of storylines whose connections eventually give rise to a relatively crystallized narrative gestalt. Depending on the context that nurtures an adolescent's moratorium, a context more or less saturated with diverse symbols and relationships, the future-oriented self-storying process will encompass a greater or lesser range of narrative refraction, resulting in multiple narrators, characters and plots increasingly organized by an integrative and cohesive overarching metanarrative position. Using M. Bakhtin's (1981) metaphors to describe novels as ideologically "polyphonic" and sign-mediated selfhood as "dialogic consciousness", we hold that a proactive identity crisis, qua exploratory meaning-construction, entails a relational organization of selfhood, creating a symbolic community of selves (Hermans & Hermans-Konopka, 2010; Hermans & Kempen, 1993). Identity foreclosure dodges crisis by yielding to a heteronomous, monological, self-system, pre-arranged by the internalized authority of an institution or significant other, thereby shielding the individual temporarily against any disturbing anxiety and uncertainty. As for identity diffusion, understood as the passive embodiment of identity crisis, very typical of at-risk youth, it may be represented as a specific type of narrative stasis marked by the lack of metanarrative capability to assess and balance the storied voices or ideological strands that compose one's polyphonic life-space. Therefore, self-diffusion is linked to a rather negative complex of future selves, and tends to fuel a broad indifference, if not hostility, towards mainstream institutions, values and norms. In such diffusedly un-engaged and relatively static identity texts, the experience of parallel relational encapsulation into closed and opposing spheres favors the formation of fragmented narrative voices that exclude and contradict each other, while their cohabitation in one's ecology remains unanalyzed and uncriticized, leading to implicit dissociation, alienation, conflict and muteness. The difference between moratorium and diffusion lies essentially in the presence or absence of a relational dynamism catalyzing the emergence of a critically self-analytic and self-writing stance that works through multiplicity and contradiction. Indeed, in order for the narrative crisis to be a relational self-developmental process attaining identity achievement, the morphogenesis of novel narrative structures must be accompanied by a high degree of metanarrative or metasemiotic consciousness that questions the symbolic materials and interactions in which the sense of self and the criteria of self-intelligibility are formed and transformed. Now, moratorium-disorganized, identity-diffused and at-risk youth with low exploratory profiles are certainly deprived of metanarrative competence, and hence taken

hostage by unbalanced interpretive mythbiographies and in-group rituals that celebrate a culture of tragic hedonism depicting life under the guise of an ephemeral play which permanently and nonchalantly puts the player at stake. In addition, the collapse of the future time perspective is intensified by "loss" taken as a self-interpretive framework. In fact, it appears that most life stories of diffused and at-risk youth comprise narratives of loss in which some experiences of suffering resist to full articulacy, carrying a hard core of haunting non-narratability, thus compressing time into a punctual here and now, place of refuge against the fear of repetition and paradoxical place of evasion without horizon. But it is the connection between interpersonal loss, dialogical poverty and present-centered media youth culture that produces sheer diffusion and vulnerability. For if, on the one hand, the traumatizing force of episodes of loss may leave the narrators temporarily speechless, unable to establish a creative alliance between others, agency and meaning; it must be acknowledged, on the other hand, that the loss is not absolutely unspeakable and disorganizing per se. Instead, narrative disorganization and paralysis proceed from a learned and shared style of self-interpretation that proliferates within certain peer groups and/or cross-generational family circles in which the narrative grammar of tragic decline, fatalistic chains of events, passive narrators and helpless characters informs the micro and macro-narratives in daily discursive interactions.

The narrative crisis that expresses an adolescent identity crisis responds to a disquieting cacophony of narrators and characters, often utterly irreconcilable (though it may be unrecognizable as in need of unification), and thus unable to be integrated into a common re-authoring process to articulate their qualitative discontinuities. The creation of a new life-story cycle involves a reorganization of episodic autobiographical memory by a learned narrative grammar that provides the form or gestalt for what can be recognized and valued as a good meaningful story by one's interlocutionary audience, namely family and peers, that is to say, one's dialogical community of live co-writing and co-reading.

Method

Research paradigm and objectives

The present research belongs to an intervention-oriented narrative research project to foster vocational definition in adolescents, embracing a qualitative, descriptive, idiographic and critical inquiry stance. In this context, we deem the analysis of narrative development to be crucial to understand not only the patterns and themes that pervade meaning-construction strategies (McAdams, 1996, 2006a, 2006b) but also the sociocultural ecology that provides particular semiotic means and belief systems (Valsiner, 2007). The main practical goal aims at the promotion of narrative innovation (White, 2007; White & Epston, 1990) through the cognitive-emotional exploration of positive future possible selves. For the lack of exploration is expected to translate into a narrow and negative range of future narrative possible selves that block motivation for change and reinforce the repetition of constraining life scenarios.

In line with recent research on adolescent narrative development (Matsuba et al., 2010; Pasupathi & Hoyt, 2009), we compare and assess different self-narrative styles with regard to vocational and identity development, in order to conceive new effective

ways for stimulating and empowering adolescents. More specifically, this requires: a) relating narrative styles to personal ideological systems; b) placing narrative development in interpersonal and social context, with its practices and discourses; c) describing the conditions for the emergence and optimization of narrative innovation and re-authoring processes; d) micro-analyzing self-narrative change within and between subjects.

Participants

The subjects of this study (N = 31; Male = 16, Female = 15) were students enrolled in two full-time vocational schools in Oporto, Portugal. Their ages range between 14 and 21 years, with an average age of 17 years, and they come from impoverished urban neighborhoods. An invitation to participate in a psychological study on "Youth and future life projects" was addressed to three different classes (i.e. Computer science, Civil construction, and Business). Students who volunteered took part in two sessions, one consisting of an individual interview and another of group discussion, lasting each of them about one and a half hours. The first session followed a narrative interview script, whereas the second session unfolded a lively group discussion on two topics: 1. the relationship between past and present in one's life story, and 2. the possibility or desire of future change. Both sessions were fully audiotaped and partly videotaped with the subjects' informed consent, then transcribed and submitted to qualitative data analysis.

Instruments

The interview was conducted in accordance with an adapted version of the Life Story Interview, originally developed by D. P. McAdams (1996), and performed with flexible constructivist sensitivity (Grant & Johnston, 2006). The interview was designed to be able to identify themes and patterns that organize the life story, linking the interpretive selection of past experience (e.g. overall life-narrative, peak experiences, nadir experiences, turning-points, good and bad moral decisions, positive and negative memories of childhood) with the imagination of future possible selves (rating the likelihood of an array of hoped and feared futures, and further elaborating on their conception of possible futures and "ideal future self"). Besides, another set of questions explored the semantic structure of the personal ideology of the subject (i.e. the system of religious, moral, social and political values), which included a series of open brief questions (e.g. "Are you a religious person? If so, how do you define God?") as well as two dilemmas to be discussed and solved, a version of Heinz moral dilemma (Kohlberg, 1981) and a version of Paul religious dilemma (Oser & Gmünder, 1988). The classical technique of counter-suggestion was used to probe the stability of cognitive structures.

Results

The qualitative data analysis attempts to show how the representation of future possible selves is related to the semantic structure of their life stories and ideological systems. In

so doing, we may chart a dynamic field of possible self-narrations in which subjective singularities are embedded, though producing a virtually infinite spectrum of sui generis narrative forms. The subjects move between narratives of loss and narratives of growth which express an ideological essential tension, whose extreme opposite poles are the denial and affirmation of values, linked to doubt and hope regarding future possibilities.

Narratives of loss: a futureless grammar and a skeptical ideology

Life-stories seem futureless when they represent the past under the form of tragedy and steady decline: the negativity of the nadir experience obliterates the significance of the peak experience, and the turning-point indicates a qualitative and lasting change for the worse. Tragic self-narratives do imagine a future line but this imagination revolves around the conviction of the high likelihood of script repetition, punctuated by tragic chains of events to be continued, and represented with inflexible cognitive passivity. The subjects who insisted on script repetition as their most likely possible future interpreted episodes of interpersonal loss as utterly destructive, central and irreversible, evoking namely the premature death of or separation from a parent, or episodes of neglect and abuse by family members. The belief in agency is superseded by the perception of external control exerted by an anonymous force driven by destructive randomness. Loss is then both a self-interpretive narrative category and an ideological metanarrative that implies self-loss, as well as the belief in circular time and in powerless volition. Paradoxically, the adoption and cultivation of a victimized identity become also a form of power in interpersonal relationships, justifying the claim for exceptional treatment, although moderated by the idea that a tragic life exposes a self engulfed by pure nonsense and helplessness. Therefore, the tragic victim demands understanding and refuses the very possibility of being fully understood by any interlocutor, regardless of their ability for empathy or insight. Events, not actions, are the efficient force of these stories of loss, which are essentially mutilated stories in that they lack narrators and characters who are capable of being the centers of narrative gravity. In other words, there is no perception of narrative self-efficacy. Instead, the meaning-making process is dominated by the belief of dispossession and heteronomy, intensified by an ego-offensive attributional style (the tragedy being told as commanded by external, unstable and uncontrollable forces).

The passivity of these tragic selves confirms their living tragedy by converting the openness of the possible futures into mere cyclical variations of their narrative reconstructions of the past. The negativity of the past is articulated with the closure of the future, and, is reinforced by a skeptical ideology that endorses a nihilistic axiological outlook (as their typical statements aptly put it: "I do not believe in anything. God, Fate, Luck, Love… childish stuff… nothing is true, nothing is worth believing." [M18] "All living things are going to die. That's the bright future of everything. In a sense, we were already dead before birth. Before birth and after death are the same thing. This interval called life is a nonsense that one must enjoy as much as possible. [*laughs*]" [F17]). This nihilism is affirmed with full confidence as the wisest last word on the meaning of life; it becomes then a dogmatic belief, impervious to criticism, and its cognitive rigidity forsakes all effortful goal-setting processes, in favor of present-centered hedonism.

Narratives of growth: a future-centered grammar and an ideology of hope

As long as the meaning of the past is negatively determined, the future cannot bring a positive discontinuity. So the imaginative invention of the future entails the fluid indeterminacy or plasticity of the past, that is, a possible redescription of the past in which the idiom of growth and learning jeopardizes the constraining texture of the idiom of loss. Further, true narrative innovation and strong agency do not emerge without a critical deconstruction of script repetition and a motivational investment towards novelty and spontaneity. However, this does not imply any denial of past suffering or disconnection with lost significant others and replacement of attachment figures (as suggested by the psychoanalytic notion of mourning as "decatexis"). Instead, the commitment to self-innovation, which opens the possibility of future, proposes a reinterpretation of the subject's place in the nadir experiences, adopting the perspective of a romantic *Bildungsroman*, a story where past and present ordeals are the necessary condition for self-knowledge, self-improvement and, eventually, self-actualization. In the narratives of growth, the nadir experiences are located in the self-generative and self-transformative process of peak experiences. "Loss" is here nullified as such, for it means an incremental gain, a dynamic resource for narrative progression.

The invention of a self-transcending future relies on the unification of subjective temporal experience under a globally positive self-appraisal, reconciling "death" with "life" and interweaving a creative thread of meaning that gives an ascending existential direction to all enterprises and ordeals. True, the ideology of hope that accompanies the narratives of growth acknowledges the temptation of skepticism and nihilism when coping with frustrating outcomes ("I do not know if God exists, especially when I feel on the brink of collapse, but I think I must believe and act as if God or Something existed, otherwise… what for?" [M16]) but refuses all dogmatism to embrace a higher level of transcendental ignorance and humility ("God may exist or not. It's a possibility, an Unknown. My mantra is *Life is a spell nobody can tell*. Instead of believing, one may hope. That's all. Peace." [F16]). The hope of narrative self-efficacy that stimulates vocational and ego-identity exploration is generated within the large ethical framework affirming the possibility of future.

Discussion and Conclusions

Multiple metanarrative principles: unconscious spectrum of opposite fidelities

Life-narratives are organized by ideological, axiological, structures and processes that we term metanarrative (though it may also qualify an individual's awareness on the conditions of their self-narrative productions). "Loss and skepticism" and "growth and hope" are the values that shape the two main metanarrative types in competition among our subjects. They provide the cultural internalized normative expectations concerning the intelligibility of specific lived experience as a recognizable "story", and therefore they guide the selective and interpretive process of sequencing life-events and connecting them meaningfully. However, although subjects demonstrate clear metanarrative preferences that proceed from their ecologies of development, those preferences are permanently challenged by contrastive metanarrative schemata because the ecologies are ideologically polyphonic

spaces that do not allow one to engage in absolute fidelities. Hence, selfhood becomes a dialogical and dialectical field organized by dominant ideal types of self-interpretation and self-narration. If such multivocality may destabilize the cognitive comfort of self-congruence, it constitutes an enriching resource that prevents cognitive rigidity and invites one to take diverse cross-paradigmatic perspectives, thereby increasing the complexity and flexibility of meaning-construction. That is why, to our mind, the analysis of metanarrative conflicts deserves to occupy a central focus in narrative research.

Vocational development acquires full psychological and psychosocial significance when considered as embedded in the developmental process of identity formation, in which the charting of the future life-space constitutes the hardcore of the motivational self-concern that is conveyed by the very metaphor of "vocation" (a unique inner voice calling for being). Our main conclusion states that the relational construction of one's possible futures comprises a selective rewriting of rational-emotional self-interpretations and socio-moral self-assessments of remembered and imagined life stories. Therefore, the future is not merely another temporal dimension: it is the imaginative virtuality that institutes the teleological unity of all subjective time and in which all other temporal dimensions originate. In other words, the self-futuring activity or the self-projective imagination is essentially polychronic and panchronic in the sense that all subjective times and their subjective wholeness are co-present, though possibly with sharp inner dissonances or even formal contradictions. As a conscious and agential temporal process, selfhood emerges from that self-futuring imagination, undergoing permanent qualitative change and opening up the idiosyncratic spectrum of one's "multi-being" that reveals the capability of their relational resources to respond to significant situational demands. Moreover, the shape of one's identity trajectories with the creation of possible, real and ideal selves reflects the appropriation of semiotic resources in certain socio-cultural ecologies. It hence follows that the dialectic tensions between the perception of likelihood and desirability of future selves proceed from internalized dialogical conflicts whose voices represent contrary life-story grammars or axiological metanarratives or *Weltanschauungen*. To sum up, once a process of subjective meaning-construction is at work, it is necessarily anchored on the semiotic saturation of experience, and, by the same token, it proves that developmental constructivism implies social constructionism.

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Chapter 4

Temporal Orientation and Future Time Perspective of Adolescents in Institutional Care

Luiza Nobre Lima
Faculty of Psychology and Educational Science, University of Coimbra, Portugal
luizabelima@fpce.uc.pt

Abstract: Based on the paradigm of Dan McAdams, according to which identity is constructed in narrative, an exploratory research of qualitative nature was conducted on the life stories and the projects for the future of adolescents placed in Childhood and Youth Homes, under the protection measure of extended placement in an institution. This study sought to answer, among others, the following research questions: Are the institutionalized adolescents more oriented towards the past than towards the future? What projects do the adolescents make for their future lives? Following the methodology of Grounded Analysis, 17 adolescents, between the ages of 15 and 18, with a minimum of 5 years of institutionalization, were interviewed. The results showed that: 1) there are no significant statistical differences between the orientation towards the past, present and future of these institutionalized adolescents; 2) their future time perspective is sparse, poorly structured, more imagined than motivational, and is mainly composed of the objects which can ensure them the basic conditions for subsistence, such as having a job and a home. From the findings obtained during this research some practical implications were taken, which concern some aspects of the care provided to the institutionalized children and adolescents.

Keywords: adolescents, institutionalization, temporal orientation, future time perspective.

Introduction

One of the main inspirers behind the concept of future time perspective, understood as the image that an individual has of his future, was Nuttin (1963 in Abreu, 1999). Particularly interested in the motivational force that the time perspective plays in behaviour, Nuttin focused on the component of future time perspective, which he widely studied. After Nuttin, future time perspective was developed by other authors like Gisela Trommsdorff and Rachel Seginer that boosted research in this field. In examining the concept of future time perspective, Trommsdorff (Trommsdorff & Lamm, 1975; Lamm, Schmidt & Trommsdorff, 1976) ended up replacing it by the concept of future orientation, and this replacement came to be accepted and used by the researchers that followed her, in particular by Seginer or Nurmi. However, this substitution of concepts seems to conflict with other dimensions of psychological time, which may result in some kind of conceptual confusion.

When Nuttin and Lens (1985) presented the definition of future time perspective, they carefully clarified the ambiguity that the more general concept of time perspective contained. "*A clear distinction has to be made between three different aspects of psychological time which often are referred to by the same term «time perspective». The first is* ***time perspective*** *proper, which is essentially characterized by its extension, density, degree of structuration, and level of realism (...). The second is* ***time attitude*** *and refers to a subject's more or less positive or negative attitude towards the past, the present, and the future. (...)* ***Time orientation****, finally, refers to the preferential direction in a subject's behaviour and thought insofar as it is predominantly oriented towards objects and events in the past, the present, and the future*" (p. 11).

When making this distinction, especially between temporal perspective and temporal orientation, Nuttin and Lens (1985) sought to make clear that they understood by time perspective all the objects located in a time more or less extended and that are virtually present to the subject in connection with his behaviour. The virtual object becomes actually present when it is aroused by a circumstance or an important motivation, making it part of the behavioural world of the subject in the sense that it is a kind of a goal to be achieved. "*In general, the objects of time perspective are among the determinants that regulate behaviour*" (p. 22).

Despite the distinction made by these authors and their investment in the study of the future dimension of time perspective, an indiscriminate use of the concepts of future time perspective and future orientation has been made, both used in some literature to mean the same. An example of this conceptual confusion arises with some authors (Zimbardo & Boyd, 1999) using the concept of time perspective to assess what they consider to be a cognitive orientation of personal and social experiences for a given temporal zone (past, present or future).

Assuming the distinction of Nuttin and Lens (1985) between temporal orientation and time perspective, a few remarks should follow to clarify temporal orientation concept.

Temporal orientation

Temporal orientation is mostly related to the degree of involvement of an individual, at a given moment of his life, with the different temporal zones. That is, the individual will be more oriented to the past, to the present or to the future, depending on the objects and events he is more focused and their placement on one of these temporal zones. This involvement can be both at the level of thought or at the level of action, although for practical reasons research on temporal orientation takes into account the level of thought. Implicitly, it is considered that there is a simple connection between thought and action (De Volder, 1979).

For people oriented to the past, the self-concept and self-assessment are based on what has happened in the past. In turn, people oriented to the present tend not to consider the past in their present life, nor to bother themselves with the future consequences of their behaviour. As for people who are more oriented to the future, they are defined by what they expect and wish for their future (Lens, 2006).

Studies on temporal orientation reveal that a predominant attention in the past (and sometimes in the future) may have negative consequences for identity formation (Rappaport, Enrich & Wilson, 1985) and to satisfaction with the self (Braley & Freed,

1971). Orientation to the past also seems to be associated with the experience of traumatic events (Lomranz et al, 1985; Holman & Silver, 1998). The life narratives of depressed individuals show that they are more immersed in the past (Habermas et al, 2007), as well as life narratives of child abuse survivors are more focused in the past and devalue the central role of the self (Klein & Janoff-Bulman, 1996).

Several studies have found that children and teenagers raised in risk environments but who have positive expectations regarding their future and make plans for it, are less likely to experience psychological and social problems later in life. For example, Wyman and colleagues (1992) have found positive expectations regarding the future to differentiate resilient children from non-resilient children exposed to high levels of stress. Quinton, Pickles, Maughan and Rutter (1993), in a sample of institutionalized children, found that during adolescence future planning was predictor of less behavioural problems and also of the choice of partners with fewer conduct problems in adulthood.

Future Time Perspective

According to Nuttin and Lens (1985), future time perspective is a concept operationalized in the following components: 1) its extension, or length or depth, 2) the density with which the objects are distributed on the future, 3) the degree of structure between those scattered objects, i.e., the presence or absence of links between objects or groups of objects, and 4) the degree of realism with which objects are perceived by the subject as a function of their distance in time. Thus, the future time perspective is a variable with a motivational value in behaviour, able to mediate the action of the individual to achieve the objects placed on the future.

Trommsdorff (1986) replaced the concept of future time perspective by future orientation which, although close to the concept used by Nuttin, is a little wider because it also includes a motivational and emotional component. This author actually justifies this conceptual change by integrating this component, making future orientation a multidimensional construct that, in addition to the dimensions of density (number of events which occurrence one expects or fears in several life domains) and extension (operationalized as the event that the subject places further in the future), has an affective dimension (optimism/pessimism). A final dimension is the internal-external control, which defines the belief that the individual has about who controls the events, that is, himself or external forces.

Seginer (1988) and Nurmi (1991) developed and further extended the concept of future orientation (that should be understood as if it were future time perspective of Nuttin [1963, in Abreu, 1999]). Nurmi (1991) considered that the way adolescents see their future should be described in terms of three key processes: motivation, planning and evaluation. In his view, first the teenager sets goals based on the comparison between his motives and values and his expectations for the future. Then, he seeks to plan strategies that will allow him to achieve the goals and, finally, evaluates the possibility of achieving these goals and update the plans he draw. In this evaluation, causal attributions and the affect towards the future play an important role.

Future orientation thus reflects the subjective representation that the individual has of his own future. Because of the developmental characteristics of adolescence many studies

have been conducted on the future orientation of adolescents. When asked about their desires and fears, many adolescents show concern about their future (Nurmi, 1991). In many cultures the goals that adolescents most anticipate respect to their future education, their profession, family life and leisure activities (Poole & Cooney, 1987; Nurmi, Poole & Seginer, 1995). To a lesser extent, still appear in the future goals of adolescents references to other domains such as migration, housing or military service, the latter more reported by boys (Malmberg & Norrgard, 1999). Crisis situations are considered as part of the normative life course, but poorly integrated in the future of the adolescents themselves. "*Crises are more likely to happen to most other people than to themselves*" (Malmberg & Norrgard, 1999, 43). Regarding worries and fears concerning their future, adolescents tend to mention the threat of war, pollution and social development (Malmberg & Norrgard, 1999), although these concerns are distal and do not interfere with their future personal pathways (Poole & Cooney, 1987).

Longitudinal studies support the idea that adolescents establish their personal goals for the future by comparison with the developmental tasks they must realize at a certain age and with the transitions in the roles they play over time. To achieve these goals, adolescents then have to build their plans given the institutional opportunities they are faced with in different life domains (e.g., school), in the relationships with peers and in society in general. It is expected that developmental patterns and beliefs about the appropriate behaviours for certain age provide a basis for evaluating the success along different developmental pathways, which in turn is expected to influence self-concept (Nurmi, 1993). A study conducted by Nurmi, Poole and Kalakoski (1994) confirms that this is the case, revealing that the goals teenagers set for the future are related with future occupation, with education and family.

The content analysis of the future orientation of adolescents living in environments that contain high levels of risk, such as young people living on the street, show that these young people, when asked about their wishes and fears for the future, give different answers than those given by the population of adolescents that were used in most studies conducted in different countries (Raffaelli & Koller, 2005). Although issues of education, work and family also emerge among adolescents living on the street, they are not, however, predominant themes. Many people express vague desires that relate to personal success and the possession of material stuff. Raffaelli and Koller (2005) hypothesize that the confusion of wishes for the future of these young people may result from the perception they have that their goals will be hardly achieved. "*Indeed, when young youth were asked to predict what they would be doing at age 18, few generated predictions that matched their hopes, suggesting a mismatch between hopes and expectations*" (p. 258).

Wishing to understand the relationships between future orientation and behaviour, Trommsdorff and Lamm (1980) conducted an investigation which examined the relationship between delinquency, institutionalization and future orientation. The results showed that delinquents, especially those institutionalized in prisons, structure their future in a less differentiated, less extensive and more internal way than non-delinquents. However, delinquents structure their fears concerning their personal development with a greater extent than non-delinquents. Future orientation varies according to length of institutionalization, in different life domains. Institutionalized delinquents anticipate future negative events they consider it will occur shortly after the moment of their release.

Despite some authors have taken a conceptual evolution of future time perspective to future orientation, in this paper those two concepts were not understood as synonymous.

In accordance with the distinction made by Nuttin and Lens (1985) between temporal orientation and time perspective, in the empirical study presented here is made an analysis of temporal orientation of institutionalized adolescents and also of their future time perspective.

Adolescents in institutional care

One of the protection measures of children and young people at risk with wider expression in Portugal is institutional care. In Children and Youth Residential Homes, official designation for the institutions that take care of underage in need of protection for extended time periods, there are many children and adolescents who are waiting for a possible return to the family. Existing or not the possibility of this return, the waiting time is usually so long that leaving the institution often happens only with the autonomy of the youngster, who once reached the institution as a child, lived there, and grew till the age limit for staying in the Institution. Given this reality, a reasonably high number of children cross their entire adolescence and prepare for adulthood in institutional care.

Although in an institutional context, young people living there need to realize a set of tasks typical of this developmental phase. The construction of their identity is one of them, which demands the adolescents to orient themselves to the future and explore possible ways to integrate society in a productive way. Adolescence is a period of self-discovery, during which people independently begin to try different roles, rehearse them, transport them to a future that they begin to imagine and for which they begin to make plans and choices. During this moratorium period, adolescents gain a new insight into their life and the experiences they have been living, and they should integrate in this path the future they are beginning to sketch. Thus, by the time of late adolescence or early adulthood, they start to build their life story, personal and subjective interpretation of their history, which will give them a sense of unity to their life and their self. Therefore, their identity will be a result of the internalization of their life story (McAdams, 2001).

An inevitable future event for institutionalized adolescents is their departure from the protection system, which becomes effective with their autonomy. The moment when these youths definitely leave the foster care condition, whether it is familial (Geenen & Powers, 2007; McCoy, McMillen & Spitznagel, 2008; Avery & Freundlich, 2009) or institutional (Dixon & Stein, 2003; Nickerson et al, 2007; Freundlich, Avery & Padgett, 2007; Raymond & Heseltine, 2008), has raised the particular attention of researchers.

Studies that analysed the transition of youths from institutions to the community show that they often change house, they have conflicts with whomever they live with, they experience great work instability, and they have low income (Jones, 2008). Also, they show high levels of school disruption and abandonment, they are victims of exclusion, and they experience vagrancy, victimization from their peers and the loss of friendship and contact with former caregivers (Dixon & Stein, 2003). Youths who are just about to leave the institution have emphasized the need to be trained in many domains so they can have some success once on the exterior. Although there are some who show a will to leave, many don't feel prepared to live on their own, with autonomy (Freundlich, Avery & Padgett, 2007).

Every Child and Youth Residential Home that has a teenager under care is inevitably involved in his moratorium; and the longer the time of institutionalization, the bigger

this involvement is. When, in fact, the care measure is indefinitely prolonged, the life project of these teens is, almost with no other choice, the autonomy. So, the institution needs to help them make real this project, trying to include on them, the personal life projects of the adolescents. At a national level and within child protection, efforts have been made to provide the institutions, in quantity and knowledge, with teams able to find valid alternatives to institutionalization and, when this is not possible, help teens to make a good transition from institution to the exterior on the condition of being independent and autonomous.

The concept of life project encloses an evident time dimension, the future. Defining life projects for the children or adolescents therefore implies planning their future, making a constant mental exercise of anticipation regarding the preparation of those children or adolescents so they can assume on their own the management of their future lives and the establishment of conditions that promote in them a proactive attitude and behaviour towards that time. In adolescence, it is also expected that the adolescents do this type of exercise, through the discovery of their new characteristics, the development of new competences, and the exploration of alternatives that help them make their choices for the future (Nurmi, 2001).

It was within this theoretical framework that this research was thought and the following research questions were formulated: 1) *Are the institutionalized adolescents more oriented towards the past than towards the future?* 2) *What projects do the adolescents make for their future lives?*

Method

Participants

Following the logic of theoretical sampling, the sample of this research is composed by 17 adolescents (9 girls and 8 boys) living in Infant and Juvenile Residential Homes, to whom was applied the measure of residential care under the Law of Protection of Children and Adolescents at Risk. Their age ranged from 15 to 18 years old (M=16,7; SD=0,920) and their nationality was mostly Portuguese (only three were from African countries with Portuguese official language). Of the total sample, eight were enrolled in regular education, other eight were attending technical-professionalizing education and one had only finished the first full cycle of basic education. The length of the institutionalization ranged between 5 (minimum required) and 16 years (M= 9; SD=3,56).

Instruments

The adolescents were interviewed according to a semi-structured guide specifically built to the interview. On the second part of the guide the questions were oriented to explore the future dimension of the adolescents' time perspective. These questions were designed taking into account the literature review on future time perspective and seek to assess various dimensions of this construct, such as content, extent, degree of realism and density. It also sought to explore how the adolescent perceives the involvement and support of the institution in achieving their life projects.

Temporal Orientation Scale (Holman, 1996; Portuguese version: Nobre Lima, 2008). The original scale consists of 28 items organized into 3 sub-scales representing the orientation to the past, to the present and to the future, that should be classified according to a 5-point Likert scale ranging from "Not at all true" (1) and "Very true" (5). In order to evaluate the temporal orientation of adolescents who are institutionalized, the original version was duly translated and adapted into Portuguese to be used in this study. The factorial structure of the original scale was empirically confirmed, being applied to 245 adolescents, 50.6% of whom were female, aged 12 to 18 years old. The mean age was 15.21 years (SD= 1.66). This sample has revealed a median value (Kaiser, 1974) of 0.68 of adequacy in the Kaiser-Meyer-Olkin measure and a statistically significant result in the Bartlett test of sphericity (χ^2 (378) = 1196.40, p <0.0005). The result of the ACP (rotation by Varimax method with Kaiser normalization) revealed the existence of three factors, which proved to be interpretable and which items are mostly grouped as in the original scale. Regarding the internal consistency of each of these factors, the values of Cronbach's alpha coefficients obtained are 0.67, 0.72 and 0.66, respectively for the factors present, past and future.

Procedures

Once composed the sample, data collection from each adolescent occurred in the Institution they lived. An interview was held, which begun by filling out the Temporal Orientation Scale.

Results

Temporal orientation

To study the temporal orientation of the subjects from the sample it was established as hypotheses that institutionalized adolescents are more oriented towards the past than the present or the future time. For the whole sample, the analysis of the statistical means obtained by the group of adolescents in the three factors Present (M=3.01; SD=0.77), Past (M=3.40; SD=0.62) and Future (M=3.24; SD=0.74), does not confirm the established hypothesis. A qualitative analysis of these statistical means shows a greater orientation of the adolescents towards the past and the future than to the present. However, these statistical means are around the same value, causing little significant differences between them that cannot quickly deploy a time to which adolescents are more oriented. The statistical comparison of these statistical means shows that between the present and the past the difference is not statistically significant (Z = 1.667, p = 0.096), the same happening between the present and future (Z = 0.504, p = 0.614), and the past and future (Z= 0.262, p = 0.794). Despite the individual differences that can be found in the temporal orientation of the adolescents which suggest a more obvious orientation to one of the temporal zones, the statistical analysis of the results representing the entire sample did not corroborate the qualitative analysis carried out, showing that adolescents valuate with equal intensity the past, the present and the future.

Future time perspective

When asked about their projects for the future, some adolescents were reluctant to speak of times to come. Their answers were evasive and made up of contradictions, as if refusing to think about the future ("*I – Do you usually think about your future, or do you ever think about your future? L – Not much. I – No? Why? (…) L – I don't like to think.*").

The reluctance of thinking about the future, which translated into some resistance to elaborate on the subject in the interview, was accompanied by some reservations about making plans for the future. Thinking little about the future, not making plans before, living at the rhythm imposed by daily life, seems to involve less insecurity and a smaller possibility of being surprised by something unpleasant. Despite all this, the interviewer's insistence on the subject undid this initial resistance and led the adolescents to elaborate about their projects for the future. Together with the projects, the adolescents also spoke about their fears, their involvement in fulfilling their projects and the involvement of the Institution.

Next, we present the results obtained in the scope of the future time perspective, considering all the projects exhibited by the adolescents. The value that appears in parenthesis concerns the number of adolescents, among the 17 of the sample, which referred that specific project for the future. The same procedure will be used for the remaining projects referred in this section.

Projects

Having a job (10). This project represents the assurance of the livelihood of the adolescents after the stay at the Institution, from which they must mandatorily emancipate, becoming autonomous. Therefore, it is important that this job could be "*decent*", "*stable*", and "*well established*".

Having a house (8). Like having a job, "*having a house*" where to live is a very realistic and concrete project that the adolescents expect to achieve, because it is also synonymous for capability of survival and protection.

Leaving the Institution (5). Although this is a sure event in the future of the adolescents, which will happen at their 18th birthday, or 21st if they request it, some adolescents stated their will to live outside the Institution's context, clearly establishing their exit as a goal to achieve ("*In the future I'd like to not be in the Institution, but at the same I'd like to be well, right*?")

Carrying on with studies (11). Globally, the most immediate projects of the adolescents are connected with carrying on their studies. Five of the adolescents wish to stay in school until the 12th grade, completing the training courses they are already attending which will give them equivalence for this school grade ("*But now I'm taking one of table waiter and then, if everything goes well with this course, maybe I'll stay in this one. If not, if I'm not very motivated with this course, I might take the one for pastrycook*"), or, when choosing this path, after completing the minimum mandatory education. The remaining six adolescents wish to attain higher levels of education ("*To study nursing*."). This is the type of project that adolescents thought they would begin between eighteen and twenty years of age, and accomplish around twenty-five.

Occupation (10). From the ten adolescents who referred the occupation they wish they'd have, half of them had already mentioned that they intended to carry on studying. Except for two of them, curiously, the occupations stated were not a logical consequence of the courses they wanted to take ("*be and actress*" and "*professional football player"*). Of the remaining five adolescents, some would like to have two careers, such as "*being a firewoman*" and "*working in health care*", or being a "*flight attendant*" and a "*model"*, or being simply a "*software engineer*", "*footballer*", and "*doctor*" or, as an alternative, a "*nurse*". The adolescents wished to start performing some of these professions, such as footballer, model or firewoman, at an earlier age, around 20. As for the other occupations, which implied a bigger investment in training, the starting age was later, beginning around 24.

Hobbies (3). Ideally, these would be hobbies that, however, would also have the potential of being an alternative to the idealized profession, should that not come true ("*Music and writing also, because I think that maybe, certainly, I will keep writing, I will keep having my ideas on paper but, I don't know, maybe carry on with music and writing*"). This reinvestment would be made at around 30 years of age, a time when the adolescent imagined having a more stable life in professional terms.

Family (13). Most adolescents formulated plans for the future that involved a family, whether it was a new family they wished to start, or doing something that involved their original family. Some of these adolescents even showed both desires. While some of them expressed the will to share their lives with someone ("*That I have someone who likes me, a girl"*), whether marrying or not, others projected "*having a family*" that also included children for whom they try to assure a life at the side of their parents, as opposed to the life the adolescents had themselves. Regarding the original family, six adolescents expressed the desire to be more close to their kin, in particular parents and siblings ("*I imagine a good life, with my brothers, my mother*").

Providing social support (3). Some adolescents showed having concerns of a social nature and included in their projects the development of activities of support to underprivileged social groups ("*help children who lived in the street, deprived children and the elderly who need it the most*").

Having their own business (3). Some adolescents also showed the desire to establish themselves professionally on their own, developing their own business, for instance, "*creating a company*" or "*having a restaurant*". They projected the accomplishment of this dream for when they would be in their 30's.

Living in another country (3). For two of them, leaving the country meant a greater proximity with their families ("*My uncle wants that, when I finish school, I go live with him in France, that he would be there and he would help me with what I need")*, whilst for the other adolescent leaving abroad was a project with a more exploratory motivation. This would be a project to accomplish before they became 30 years old.

Traveling (2). Traveling seemed to be synonymous for discovery and knowing new places or a way to accumulate a certain type of knowledge to implement in a particular business ("*cooking*").

Other projects (6). One important wish was the happiness they aimed at in their future lives – "*I want to be happy*!" or "*to be healthy*".

Fears

In what regards themselves, one of the fears expressed more often by the adolescents, concerns life outside the Institution and the capability of living on their own. For six adolescents, leaving the Institution, knowing that they would take on the responsibility for their livelihood, many times not having someone who could be a source of support, was frightening, mainly when they realized other youths who, like themselves also had lived in Childhood and Youth Homes, faced many difficulties and had a life well below what they had imagined ("*Not being able to, not being able to do this transition well, from the Institution to the outside.*"). The prospect of not finding a job that assures them some support and the minimum conditions to live properly, was synonymous for a destroyed future ("*Because I think about not knowing if one day... not having a job one day and living in the street.*").

The need for livelihood was a vital concern for the adolescents, which could, in some cases, prevent them from attaining certain goals, such as to carry on studying ("*I'm afraid that... maybe the biggest one of them is not getting (...) the profession I want to have*").

Other adolescents feared for themselves, for their fragility, they were afraid of making the mistake of "*not taking the opportunities that people give me*" and, because of that, "*not having a life*" or doing something that would prevent them from reaching their goals and accomplishing their projects. Some adolescents were also afraid of "*being alone*", "*not having a good marriage*", "*having some serious disease*" or "*dying*".

They also feared "*that something happens to my family*". They were afraid they would stop seeing, or even losing, their bonding figures "*losing my mother and my grandmother and also my father*") and they were afraid of not being able to assure the care or their siblings, in the absence of the parents.

Actions leading to the accomplishment of projects

"*Studying*" was the action that six of the adolescents most did to assure that they would reach their goals. Studying with commitment, always trying to give the best ("*I study every day, like (...) always perfecting, like, I don't know, giving my best*"), although some do it with sacrifice. For other five adolescents, reaching their goals arose from actions they considered to depend upon their commitment ("*I – Look, what do you try to do for your projects to come true? L – I work for it. I – And how do you work for it? L – [silence]*"), their determination ("*And having determination, I think so too"*), and their effort ("*I have to work hard at school*"). They also considered that it would be important to "*be someone*", "*have the head in place*", not involving themselves in risky behaviours that could turn them away from their goals ("*I – What do you try to do for these wishes to come true? L – Not taking the wrong road, studying. I think that's all*") and believing in themselves and in what they wished for themselves ("*First of all, when we want something, I think that I don't know if I'll achieve it, but I think that we have to have faith in ourselves, I have to have faith in ourselves and in what we are going to do*").

Although they identify these attitudes as potential ways of accomplishing their projects, they did not refer any actions they performed that could translate those attitudes, showing difficulties in instrumentalizing their ideas. In fact, all these five adolescents seem to display a behaviour that does not agree with their ideas about how they can accomplish their goals. Some don't plan actions, simply because they avoid thinking about their future or because they recognize their inertia and their low investment in studying ("I – *You say you want to*

take the course to become a pastrycook, want to have an occupation, you want children, want to live with someone. What do you try to do in your daily life to make sure that these things will happen? N – I don't know... I hardly think.").

Only one adolescent was able to operationalize her commitment and her effort, presenting concrete actions directly related with some of her projects for the future.

Support from the Home to accomplish projects

The adolescents seem to recognize in the Institutions a very concrete concern with their transition and adaptation to the outside world. They identified, in this way, several actions taken with the common goal of developing self-competences that would allow them to manage their daily lives with autonomy: "*they teach how to cook*", "*doing laundry and those things. Cleaning the house*"; "*they teach us to set the table, to eat, doing the dishes too, doing the cleaning and all that*". There was also a concern of teaching them to look for certain services, such as health care ("*they took us to the doctor and they would go with us and now they stopped doing that so much. Sometimes we go alone, I don't know, which helps us a lot*"), or search for financial support from social security that could be a reinforcement to the adolescent's livelihood ("*Right now, [the Technician] is, as she knows that I want to leave, she is worried and trying to find a way for me to have some support from social security for when I leave. Some help. She is thinking of my future*").

Another line of action that the adolescents recognized in the Technician's work was related with the definition of their school paths and the choice of a profession. Five adolescents referred that the technicians and teachers often questioned them about their preferences and personal choices, thus trying to help them plan their future based on their wishes and finding possible alternatives ("*The people who deal more with the transition, they are constantly worrying and asking what I..., if I already decided what I want to do in the future, what I want to do.*").

Five adolescents in the sample did not recognize any help from the Institution, or they considered that this help was scarce. They did not identify any actions taken by the technicians aimed at the benefit of their future. Within this group of adolescents, two considered that the help they had from the technicians was scarce or none due to the little time they spent together at the Institution ("*I – And they help you to think about the future? P – Sometimes. When you get here you hardly have any time to talk to the Doctors. You get here, there's almost no one here. And when, when you catch the Doctors here, after five minutes they're already leaving! You hardly have any time to talk.*").

Feelings regarding the future

The feeling that was mostly expressed to describe what the future awakened in the adolescents in the sample was "*fear*". Fear mainly of "*not being able*" to achieve what they wished for their future and that this failure would lead to difficulties in their livelihoods, which would translate to a life of poverty, unprotected and adverse. The impossibility of predicting the future was a reason for "*anguish*" and "*concern*" for one adolescent, while another one felt "*sadness*" when he thought that in the future he would not have the company of friends he had made in the Institution. However, three adolescents expressed

opposite feelings: "*anxiety*" for the closeness of the future, "*happiness*" because future represented the possibility of doing the things that gave her most pleasure in her own way and finally a driving force that gave her a proactive attitude.

Discussion

The risk characteristics borne by the lives of the adolescent's in the sample – the abuse in the past and the institutionalization in the present – raised suspicions that they would be more focused in adverse, perhaps traumatic, experiences of the past and the present and less directed towards the future. The scientific literature tends to confirm this hypothesis with studies that relate, for instance, trauma (Klein & Janoff-Bulman, 1996; Holman & Silver, 1998) and depression (Eisenck, Payne & Santos, 2006; Habermas et al, 2007) with the orientation towards the past, including in adolescents (Kuyken, W.; Howell, R. & Dalgleish, T., 2006). Nevertheless, the interindividual differences that the qualitative analysis of the data can highlight seem to cancel each other out when the sample is analysed, as a whole, with statistical procedures. In fact, the results of the statistical analysis points to a homogeneity in the attention given by the adolescents to the past, present, and future times, which seem to infirm the hypothesis of there being a greater valuation of the past, mainly in contrast with the future.

A limitation of this study for the purpose of a quantitative analysis regards the size of the sample. This is a small sample, which requires the use of non-parametric statistical tests that have a smaller discriminating power. The validation of these results would demand an evaluation of the time orientation in a larger group of institutionalized adolescent, which would allow applying parametric tests, more sensitive to data variations.

The perspective the adolescents have of their future mirrors a lot of what is their general attitude towards that time that has yet to be lived. Although the results have shown that the attitude the adolescents manifest regarding their future is not the same for all of them, on the whole, fear is essentially what shines through.

Speaking about the future, thinking about the future, and consequently, making long term plans is an exercise that the adolescents only do with reservations (hence all the initial reluctance in the interview), an effect of the feelings and fears that are awakened by it. This fear of thinking about their future is motivated by the uncertainty of being capable of transitioning well from the Institution to the outside world. Here, success means assuring their livelihood with autonomy, i.e. having a job that provides them conditions to live with dignity and, preferably, a job that reflects their professional dreams.

The issue of being capable of having a livelihood in the post-institutional period plays a central role in the perspective of the future of the institutionalized adolescents. This capability of having a livelihood is central not only because it is vital for any individual to think of its own survival, but because the need to work to live can prevent them from accomplishing the future they wish. In other words, when the adolescents leave the Institution they must work in order to assure their livelihood, which could mean they can be confronted with the need to quit studying and, therefore, not being able to achieve goals that depend on a more complete school path in the future. Additionally, when looking for a job with fewer skills, the possibilities that arise will certainly be less capable of providing better conditions of living.

Although the less favourable scenarios that the adolescents can imagine may become real in the future, they still dare to wish to achieve more ambitious projects. And when they dare to do it, they can, in a certain measure, identify some of those projects. Thus, the attitude of the adolescents towards the future oscillates between the wish for a posterity that brings them safety, good living conditions, and happiness, and a very real fear of not being able to create the conditions for the future to be, in fact, promising. This fear is strengthened by the awareness that, once out of the Institution, they will depend mainly on themselves and that they may lack a support they will no longer have.

When they give themselves the opportunity to have a perspective of their futures, the adolescents can place their life projects in a time frame. These projects are not many, nor varied. They mainly concern staying in school, in vocational schools or in universities, conquering a profession they wish to have in the job they find, both mainly the job itself, to which they add a place to live and a family, with a partner, husband or wife, or even children.

The future time perspective of these adolescents is not very dense, and reaches at most to 40 years of age. Before their 20th birthday they wish to finish their education, find a job, and be settled in a home. The job comes up sooner for the adolescents that decide to pursue vocational training. These are the ones that first wish to start a family, starting at the age of 25. The others place this kind of project closer to the age of 30, with children being born in the following 10 years.

After hearing and analysing the adolescents' projects, a certain idealization of their future can be perceived. The job and the home were projects that were stated with much certainty and affirmation, clearly translating the notion that these are projects that they need to accomplish in order to subsist. Regarding the pursuit of school and the occupation, the discourse was vaguer, sometimes a little conditional and revealed very little commitment from the adolescents to accomplish it. In fact, in the adolescents' future time perspective there are no projects that are means to achieve larger projects and the strategies they identify as being necessary to achieve them are only knowledge they do not apply, because they recognize their own inertia. This happens with the simple act of studying, which is, obviously, an essential strategy for progress in school.

The adolescents' perspective of the future does not present thus any structure and, therefore, finishing a university degree and having a certain occupation appears in the adolescents' discourse as idealized projects that they wished to accomplish, but that, simultaneously, they seem to predict they will not be able to reach. Also the family they wish to have appears idealized in their perspective of the future. Regarding this topic, the adolescents' discourse reflects the absence of protection and affection in their lives, patent in the wish to have children and give them a family that is a reference of affection and safety, as they wish they'd had but didn't.

Like the family they wish to start, the adolescents' family of origin is also part of the objects included in their perspective of the future. Their wishes show closeness to the family, harmonious relationships between its elements, with the adolescents themselves playing the part of caretakers of their parents and mainly their siblings. The fears expressed by the adolescents strengthen their need to compensate, in the future, for a life marked by being away from the family. They are afraid of losing, hopelessly, the most significant people they are in contact with in the present.

The future projects for the adolescents are spread along a timeline, without connection between them and scheduled only according to what they imagine is the natural or adequate

time for accomplishing them, characterizing a perspective of the future with little structure and more imagined than active or motivational.

The perspective of future time of the adolescents in the sample is dominated by their need to ensure an autonomous livelihood and by the presence of the family in their lives. However, there are other goals that populate the vision of the future of these adolescents in a less tangible way, of which professional wishes are an example. These are wishes that do not have a truly thrusting role in the behaviour of these youths, who show difficulty in committing themselves. More than inertia, the attitude they demonstrate reveals a state of dormancy, a torpor that paralyses them and prevents them from acting. It seems that the strength of their fears and dreads overwhelms the strength of consciousness and wishes, preventing these wishes from losing their idealized features and from becoming real projects capable of motivating them to commit more in their accomplishment.

Regarding the value of expectations and aspirations of the adolescents and the supposed role they have on their behaviour, as if assuming in this process of influence the value of self-fulfilling prophecies, Stephen Morgan (2006) contests a supposed causal relationship between these variables. As an alternative, he presents arguments for a relationship that is mediated by the significant people for the adolescent and by the educational institutions, acknowledging in these mediators an important role in the process of reaching educational and professional goals of the adolescents. Morgan supports part of his argumentation in the theses of Pierre Bordieu (1973 in Morgan, 2006), which considered that the structures of society offer unequal opportunities, determining the aspirations of the individual because they establish up to which point these may be satisfied. "And, as such, aspirations and expectations have no autonomous explanatory power, as they are nothing other than alternative indicators of attainment" (p. 1530).

Taking these theses as reference, one can achieve some understanding about the attitude towards the future of the adolescents in the sample, since the family, a very significant reference structure for them, had a weak role in creating conditions for organizing the adolescent's future before institutionalization, and even that role stops after the institutionalization. Once they are living under the care of a Childhood and Youth Home, it becomes evident that this institution needs to organize itself as a way to lessen and compensate the weaknesses that children carry over to this new context, thus becoming a facilitator in the achievement of the adolescents' future projects.

Despite the disadvantage that the Institution has, because it can never become an alternative to a healthy family context, where there is caring and affection, it must try to compensate for these weaknesses in the adolescents by providing them with capabilities that help them make their future viable. And it can do so also by appealing to the participation of other social structures with competences in matters of childhood and youth, which can contribute to reduce the disadvantages with which these adolescents reach the Institution.

Regarding the perception that the adolescents have of the support provided to them by the Institution for the preparation of their future and the accomplishment of their projects, the results leave no doubt that they acknowledge the effort of the Institutions in providing them very practical and concrete experiences with the purpose of enabling them to manage their daily lives and to solve the problems of an autonomous life outside the Institution.

The adolescents also perceive the act of studying as a strategy that is very valued by the Institution, acknowledging in the support teachers an important instrumental value to help them advance in school. They also acknowledge the care of these teachers in helping

them choose a school path in accordance with their vocations and preferences. In spite of this acknowledgement, the perception that some adolescents have of the mismatch of the technical team and the adolescents should not be underestimated, as neither should the opinion of one adolescent in particular that manifested not having felt any help from the Institution, above in the discovery of his vocations. This mismatch concerns the little time that adolescents and technical team spend together at the Institutions. When the adolescents arrive at the Institution from their school activities, the elements of the technical team are at the end of their work schedule.

Based on the perception that adolescents have of the help they receive from the Home in order to organize their future, it can be seen that Institutions try to prepare the adolescents for a life project that includes autonomy, providing them with practical capabilities for managing their daily lives and for the relationship with the social Institutions that they will have to resort to more often, also promoting the acquisition of school and professional skills, preferably in accordance with their interests and wishes. Here, we have two future projects that must cross paths. One is the project that the Institution must find for the children and adolescents and which has the scope of the protection measures presented by the law as an alternative, and the other is the project that the adolescent himself creates for his future life and which is much broader and encompassing than the previous.

When it is necessary to define a life project for the adolescents, which also includes their interests, the Institution needs to enable them for this team work. And this enablement does not concern only making choices according to their vocations, interests, and wishes. It concerns, above all, the discovery of these vocations and interests, the promotion of personal skills for exploration, self-construction, and decision, which give the adolescents conditions to discover their motivations and skills, so that they can then accomplish, in their future, less idealized choices, that will thrust them towards the persistence to achieve them.

This work does not seem much different from what is done for any adolescent, whether institutionalized or not. An adolescent that lives with the family usually relies on its help to develop the skills mentioned. The data from this research show a relation between attachment and the motivational strategies of adolescents, suggesting that students with a secure attachment have better motivational strategies than those with an insecure attachment (Soares, Lemos & Almeida, 2005).

However, a fear of thinking about the future was identified in institutionalized adolescents and, therefore, they need help to achieve it. This is because their future exists only as a thought, and if it is not possible to think about it, it is not possible to plan it. If planning the future in a realistic way is painful for these adolescents, they need help to do it. Otherwise, it will be difficult or even impossible for them to become the adult they imagine, an adult with strong psychological characteristics, as shown in the results found.

Future research

Further research on time orientation of adolescents in institutional care is needed. A qualitative and more individual analysis of the results suggested that there are adolescent who are in fact more directed to the past instead of the future, but there are others who are as just as or even more focused on the future than the past. What is the meaning of the differences at the time orientation level between the adolescents in this sample? Is the

orientation towards the past in fact synonymous for maladaptation and the orientation towards the future coherent with a more adaptive behaviour? Other investigations with larger samples should be carried on in order to clarify this suppositions and to study the relations between temporal orientation and future time perspective in institutionalized adolescents, which may bring more clear data that might help technicians to conceive more adequate strategies to help these individuals developing better life projects.

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Chapter 5

Antisocial behaviours in adolescence: The importance of personal history, present development and future perspective

Alice Murteira Morgado
Maria da Luz Vale Dias
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal
alicemmorgado@gmail.com
valedias@fpce.uc.pt

Abstract: Our work offers a reflection on antisocial behaviours in adolescence that seeks to review and synthesize relevant and prominent perspectives on the subject, focusing on those that come from a developmental point of view. Such a framework implies, thus, a description and explanation of the antisocial phenomenon in its history, development and possible outcomes, more specifically, its etiology, risk and protective factors, developmental trajectories, manifestations, desistance and persistence mechanisms, and degrees of severity. Therefore, the importance of answering specific questions concerning the time at which antisocial manifestations first occur, the origins of such manifestations and the pathways followed before and after is highlighted. In fact, since antisocial acts may take place at different moments in the lifespan, our purpose was to identify the peculiarities of the phenomenon in adolescence, with particular focus on aspects that undergo considerable development at this stage and may play an important role in risk behaviours, namely, future time perspective, self-control, delay of gratification, psychosocial competence and interpersonal relations. The general conclusion of our review shows that several questions remain to be answered, particularly in the Portuguese context. Hence, we present a project of investigation seeking to address some of those issues.

Keywords: antisocial, adolescence, developmental, trajectories.

Introduction

A general assumption regarding the meaning of antisocial behaviours could be that they describe behaviours that violate social rules intended to promote respect and consideration towards other people's life and property (Burt, Donnellan, Iacono & McGue, 2011; Kagan, 2004). Such definition makes it clear that the concept of antisocial behaviour is a socially determined construct that may include many different subtypes (from overt to covert), levels of destructiveness, forms (from direct to relational), functions (from instrumental to reactive), onsets (from early to late) and pathways (desistance or persistence). Ultimately, it "must be interpreted as a social event, with meaningful subtypes, topographies, antecedents, and functions" (Dodge, Coie & Lynam, 2008, p. 437).

Although we can list several examples of possible antisocial acts, the identification and study of antisocial behaviours, especially in adolescence, is defined by a high level of

uncertainty. Actually, "examples during childhood and adolescence range from more or less normative behaviours, such as lying and underage alcohol use, to rarer but more severe behaviours, such as animal cruelty, theft and assault" (Burt, 2012, p.264). Indeed, not only the manifestations of such behaviours present great variability from individual to individual, but also the very definition of the antisocial act presents a big relativity regarding its classification and level of maladjustment involved. A specific behaviour may be considered antisocial in one culture but may be accepted and viewed as adjusted in another culture. It must be taken into account as well that some antisocial behaviours are almost normative for some groups of individuals, even in societies where they are disapproved. We also need to look at the motivations and levels of pathology that characterize such behaviours, since "some criminal acts represent a highly principled form of civil protest" (Rutter, Giller & Hagell, 1998, p. 113) and, in some cases, are performed without the intent to cause harm or violate social rules. Particularly, before adulthood, as it will be further explored, the individuals' behaviours may be motivated by a multitude of factors, some of which do not necessarily involve pathology or intent to harm. In other words, "some criminal acts are indeed normal in the triple sense that their motivation is moral rather than antisocial, that the usual risk factors for crime do not apply, and that they do not reflect either social malfunction or personal psychopathology" (Rutter, et al., 1998, 113). Moreover, despite being a serious social and public health matter, antisocial behaviour in adolescence is often difficult to quantify because most acts are not formally reported to health or legal entities.

In this context, and from a developmental perspective, adolescence is viewed as a unique stage of human development with very specific characteristics. It is period when individuals do not only strive to adapt to the environment and seek balance, but also seek to build their own identity. This occurs while multiple and profound physical, cognitive, moral and socioemotional changes take place (Steinberg, 2009; Taborda Simões, 2002). Hence, antisocial behaviours that are manifested at this stage must be analyzed and interpreted within the context of such profound developmental changes and all the underlying complexity and significance.

The complex and heterogeneous nature of antisocial behaviours, especially in adolescence, is, thus, well acknowledged in literature regarding this issue (Rutter, 2004), and there is a wide range of researchers that have been seeking to describe and explain the antisocial phenomenon, as well as its etiology, determinants, related trajectories, manifestations, degrees of severity, and persistence/desistance mechanisms. Developmental theories, in particular, offer an interesting framework on antisocial behaviour that concern, not only a descriptive analysis of antisocial acts and antisocial individuals, but also consider its genesis and possible trajectories. "The assumption of developmental models is that specific risk variables cause children to follow specific developmental trajectories. This implies that changes in these risk variables should influence the course along which these children develop" (vanLier, Vuijk & Crijnen, 2005, p. 522). Thus, in order to understand the antisocial act from a developmental perspective, we need to understand at what point in the individual's life it occurred, how it was originated, and what pathways (i.e. persistence or desistence, more or less severe antisocial behaviours) were followed by the individual before and after. In the next section we address some of these aspects with a reflection on the specificities and factors that may enlighten our knowledge of adolescent antisocial behaviour, followed by the introduction of a project of investigation aimed at studying the antisocial phenomenon in adolescence from a developmental perspective.

Developmental aspects: The importance of personal history, present development, and future perspective

The starting point of our review is the acknowledgment of the heterogeneous character of the antisocial phenomenon, which "constitutes a challenge for theory, research and intervention design" (Moffitt & Caspi, 2001, p. 355). In fact, the complexity involving antisocial behaviours is evident if we consider the number of different deviant manifestations (that range in nature and severity from running away from home, threats or truancy, to theft, violent attacks or violation, amongst many others) and the diversity of antisocial individuals and possible antisocial trajectories. Laub, Sampson and Sweeten (2006, p. 323) even recognize, at this purpose that "there will always be a considerable heterogeneity in criminal offending no matter how many factors are taken into account".

Regarding adolescence in particular, there is a wide consensus that this developmental stage seems to involve a significant increase in prevalence of antisocial manifestations. Actually, the rapid increase in deviant behaviour during adolescence followed by a rapid decrease after this developmental stage has been named *the age crime curve*. This is a curve characterized by a rapid increase in deviancy in midadolescence, a peak in late adolescence, a marked decrease in early adulthood (or emerging adulthood) followed by a gradual, monotonic decline (Blonigen, 2010). Explanations for this phenomenon have included biological aspects, such as the rise of testosterone levels and neurological maturation, and sociological aspects, such as the increase in the environment's role and the peers' influence on the individual's conduct, that typically takes place in adolescence (e.g. Blonigen, 2010; Farrington, 2007; Tremblay, 2000). In this regard, Moffitt (1993) argues that both prevalence and incidence of offending are more frequent in adolescence and that criminal offenders are mostly teenagers. According to the author, this occurs because, in childhood, delinquency is more of an individual psychopathology, while in adolescence it becomes almost normative (shifting again to being psychopathological in adulthood).

In fact, distinctions in antisocial behaviours can be set according to several criteria, but age appears to be, if not the main focus, at least an important topic of discussion for many authors. Examples of its importance can be found in several prominent developmental models that consider age-of-onset as the main criteria to define a taxonomy of antisocial behaviours and to characterize the development of deviant trajectories (e.g. Farrington, 2008; Lahey & Waldman, 2004; Moffitt, 1993, 2003, 2006; Patterson & Yoerger, 2002a, 2002b; Sampson & Laub, 2005; Thornberry & Krohn, 2004; Zara & Farrington, 2010). In general, a relation between precocity and severity/persistence is pointed out, with the notion that the earlier the onset of deviant behaviours, the more severe and persistent the antisocial path will be: "chronic antisocial behaviour after preadolescence is the continuation of a pattern that begins in early childhood" (Lacourse et al., 2002, p. 909). Indeed, it is believed that, when problems start later in development, individuals may have experienced already some prior positive or prosocial opportunities that can serve as protective factors against a persistent delinquent career (Moffitt, 1993, 2003, 2006; Patterson & Yoerger, 2002a, 2002b; Thornberry & Krohn, 2004). Sampson and Laub, however, argue that "crime declines with age even for active offenders and that trajectories of desistance cannot be prospectively identified based on typological accounts rooted in childhood and individual differences" (Sampson & Laub, 2005, p. 17). Regardless of each particular position, it appears to be consensual that the processes and risk factors

involved in persistent and chronic antisocial behaviour are different from those involved in adolescencelimited deviancy, which means that the age at which conduct problems are manifested seems to be an important factor to consider when we analyze deviant trajectories.

From a different viewpoint, Tremblay (2000, 2010), recognizes the importance of the age at which behaviours manifest for the severity and persistence of antisocial paths, but suggests a differentiation of antisocial behaviours according to types of antisocial manifestations (overt and covert) instead of ageofonset. As Loeber and Schmaling (1985, p. 350) had previously suggested, "it would be fruitful to use distinct treatment approaches for covert and overt patterns of antisocial behaviour, each focusing on separate behaviours and different etiological variables". In this regard, Burt et al. (2011) presented findings from a recent study implying that, contrary to what was anticipated earlier, the age at which antisocial behaviours first manifest is not as important as the behavioural subtypes linked to ageofonset are for the prediction of antisocial trajectories. In fact, research has pointed out to the fact that, not only different antisocial behavioural subtypes may evidence different behavioural trajectories, but also that developmental trajectories of different types of antisocial behaviour may not be driven by the same proximal and causal factors (Burt, 2012; Lacourse et al., 2002). In particular, Burt (2012) concluded that aggressive (overt) behaviours tend to be more consistent over time, while rulebreaking (covert) behaviours tend to be more frequent during adolescence.

Interestingly, it appears that the behavioural subtypes distinction corresponds more or less to the ageofonset distinction: physical aggression is particularly characteristic of childhoodonset antisocial behaviours, whereas rulebreaking is linked to adolescenceonset antisocial behaviours (Burt, 2012). This may be explained by aspects related to socioemotional development, since "one of the major developmental challenges of a child is to learn to inhibit physical aggression and use other patterns of action in his attempts to achieve his goals" (Tremblay, 2010, p. 347). In fact, Patterson and Yoerger suggest that overt forms of antisocial behaviours grow during toddlerhood, whereas in adolescence covert antisocial behaviours tend to be more significant: "the toddler growth spurt is characterized, primarily, by overt forms; whereas the adolescent growth spurt is characterized by massive growth in covert antisocial behaviour accompanied by additional growth in new forms of overt antisocial behaviours" (Patterson & Yoerger, 2002a, p. 148). Lahey and Waldman's model also typically associates earlyonset of antisocial behaviours to less severe forms of overt behaviours, whereas a later onset appears to be related to covert behaviors and aggressive overt behaviours, in agreement with Moffitt's model, that describes a link between ageofonset and behavioural subtypes (Burt et al., 2011). In sum, it appears that the differences between distinct behavioural subtypes evidence normative aspects of socioemotional development, as reflected by the differences between early and lateonset antisocial behaviour trajectories. In other words, "the AGG [aggressive] and RB [rulebreaking] dimensions appear to capture much of the same information as the age-of-onset types" (Burt, 2012, p. 272).

Regarding the factors involved in the antisocial phenomenon, most authors agree that a wide array of possible variables may contribute to different deviant trajectories. From a thorough analysis, these factors appear to be related to three major groups, that is, individual characteristics, social environment, and family characteristics. Developmental theories stress that the impact of such sets of variables may be different according to the individuals' age or stage of development (Lahey & Waldman, 2004; Tremblay, 2000, 2010). Indeed, studies from a developmental perspective show that the impact of family, peers and school

factors differs in different ages during development, with divergences appearing when the relative value of each group of variables is discussed. Moffitt's perspective (1993, 2003, 2006) suggests that aspects such as personality and behaviour are strongly influenced by personenvironment interactions. In other words, "the child acts; the environment reacts; and the child reacts back in mutually interlocking evocative interaction" (Caspi et al., 1987, p. 308 *cit in* Moffitt, 1993, p. 683). Lahey and Waldman (2004) state that "genetic influences interfere with the environment where behaviour problems are learned, partly due to the effect that the child characteristics (temperament and cognitive skills) exert in that environment" (p. 187-188). Accordingly, Patterson and Yoerger (2002a, 2002b) raise the hypothesis that antisocial trajectories result from a joint effect of biological and environmental variables, and, in Thornberry and Krohn's perspective (2004), the interactions between the individual and the environment originate behavioural patterns, in a reciprocal influence.

The common aspect in developmental psychology is the active role of the individual in its interactions with the environment, that is crucial to define how he/she thinks and judges the social world around him/her. In this sense, "social interactions are involved in the individuals' constructions of moral judgments" (Turiel, 2008, p. 489), while moral judgments may influence social interactions. In this context, adolescence, when social relations assume a growing importance in the individuals' lives, and when psychosocial competences are still far from being fully developed, appear to be a critical stage to identify, prevent and/or compensate for psychosocial vulnerabilities. In fact, many theories on moral judgment and psychosocial maturity highlight the role of these competences in the understanding of antisocial behaviours (Bandura, 2002; Kohlberg, 1981, 1987; Piaget, 1965; Schultz, Barr & Selman, 2001; Selman, 1975; Selman & Adalbjarnardottir, 2000), that appear to be determinant, either as protective factor or risk factor, in guiding individual's choices regarding social behaviours (Mota, Matos & Lemos, 2011; Selman & Adalbjarnardottir, 2000). These aspects are particularly important to study in childhood and adolescence because psychosocial maturity and tasks that require coordination of affect and cognition are still in development, at least, until young adulthood (Steinberg, 2009). In fact, more immature stages of morality have been identified as risk factors for antisocial behaviours, whereas achieving more mature stages of moral development may protect against deviant conducts (Monahan, Steinberg, Cauffman & Mulvey, 2009; Stams et al., 2006). Psychosocial maturity is also believed to encourage prosocial and altruistic behaviour, serving as protective factor against several conduct problems. Likewise, perspective-taking ability has been found to lead to more relationship enhancing outcomes, whereas the lack of such competence may contribute to facilitating anger arousal in situations of interpersonal provocation (Mohr, Howells, Gerace, Day & Wharton, 2007). Moral disengagement has also been strongly linked to antisocial behaviours in childhood and adolescence, as well as to delinquent behaviour (Bandura, Barbaranelli, Caprara & Pastorelli, 1996; Bandura, Caprara, Barbaranelli, Pastorelli & Regalia, 2001; Bandura, 2002; Hyde, Shaw & Moilanen, 2010). In other words, having underdeveloped psychosocial competences appears to encourage antisocial or aggressive behaviour, whereas "to the extent adolescents can develop perspective on the complex connections between their own biological, personal, and cultural relationship histories and their own individual health choices in daily life, they are more likely to keep themselves out of harm's way" (Selman & Adalbjarnardottir, 2000, 50).

Hence, morality and psychosocial characteristics – that are clearly so important in the children and adolescents' social experiences – play a very significant role in antisocial behaviours. It is quite consensual that the tendency to show altruism, sympathy, and respect may be determinant in preventing an antisocial trajectory, whereas lack of social sensitivity, empathy and perspective-taking in social interactions may put individuals at higher risk of engaging in antisocial behaviours.

Control also appears to play an important role in antisocial trajectories, either as an individual, social, or family aspect. In fact, theories such as Gottfredson and Hirschi's (1990) and Sampson and Laub's (2005) assign a prominent role to this variable. In the General Theory of Crime (Gottfredson & Hirschi, 1990), control as an individual feature is highlighted: low selfcontrol appears as the main risk factor for a criminal career. Indeed, personality traits like temper, impulsivity and egocentricity are considered "by-products of self-control and can be rightly used to index levels of self-control" (DeLisi & Vaughn, 2008, p. 533). In Sampson and Laub's LifeCourse Theory of Crime (2005), control as a social variable is evident in the sense that informal social controls are considered determinant for creating strong bonds between the individual and the society, thus reducing the likelihood of committing a crime. Accordingly, Thornberry and Krohn (2004) stress the role of the individuals' bonds to conventional society in the genesis of delinquency. In addition, some models also acknowledge the importance of control as a family factor: in Patterson and Yoerger's model (2002a, 2002b), changes in problem-solving strategies in the family, discipline, and control (that coincide with the beginning of adolescence) help to explain the late onset of delinquency; Thornberry and Krohn (2004) also mention the lack of parental capacity to establish an effective system of control, monitoring, supervision, reinforcement of prosocial behaviors, and punishment of antisocial behaviours as a risk factor for precocious offending; and Farrington (2004) refers to inadequate supervision as a risk factor for delinquency.

In this context, the study of personality in the scope of antisocial behaviours appears especially pertinent and there is a vast array of literature on this matter that has tested the hypothesis that there are differences in personality between individuals who manifest and do not manifest antisocial tendencies. Actually, a comprehension of an antisocial individual's personality may help to understand his/her social behaviour and vice-versa, thus contributing as part of a model that intends to be extensive and complete. "Taking personality into account implies accepting the existence of cognitive, affective, and behavioural tendencies that may favour delinquency" (Romero, Luengo & Sobral, 2001, p. 344-345), which means that, more than looking for particular preferences for one or another type of antisocial behaviours, we should focus as well on personality characteristics related to the tendency to break rules and to the refusal/inability to follow social rules

According to Eysenck's theory of personality (Eysenck & Eysenck, 1985), individuals with antisocial tendencies typically present high scores on the three traits included in the author's model of personality: extroversion, neuroticism, and psychoticism, combined with low scores on the Lie scale (L) from the Eysenck's Personality Questionnaire (EPQ). In this sense, a high score on extroversion would mean that the individual is more difficult to condition and, consequently, has a greater difficulty to inhibit any potential antisocial tendencies. Accordingly, a high level of neuroticism is considered to be related to deviant behaviour in the sense that it is related to anxiety, which is believed to act as a drive or to increase the drive for antisocial behaviour. Finally, high psychoticism is also believed to

be associated with antisocial behaviour because it describes individuals who are typically egocentric, with reduced sensitivity towards other people's feelings, lack of guilt, and who manifest interpersonal hostility. Unlike the previous traits, psychoticism has gathered more agreement regarding the existence of its strong relation with antisocial behaviour (Carrasco, Barker, Tremblay & Vitaro, 2006; Center & Kemp, 2002; Center, Jackson & Kemp, 2005; Romero et al., 2001). A low score on the Lie scale of EPQ has also been mentioned as a potential characteristic of antisocial individuals, since it may be considered as a measure of socialization and social conformity. In fact, some research has provided evidence that confirms this hypothesis (Center & Kemp, 2002; Center et al., 2005).

Another interesting theoretical perspective on the subject of personality and antisocial behaviour can be found in Gray's reinforcement sensitivity theory (1991), a model where motivation and emotion play an essential role in personality. The author identified three neurobiological systems of learning that differ according to some of the individual's personality traits: a behavioural inhibition system (BIS), a behavioural approach system (BAS), and a fight/flight/freezing system (FFFS). According to this model, average individuals have balanced systems of inhibition and approach, while antisocial individuals tend to show lower sensitivity to punishment (a weaker BIS) combined with oversensitivity to rewards, that is, a more responsive BAS (Fonseca & Yule, 1995). The explanation for such imbalance lies on the fact that, for antisocial individuals, deviant behaviours are perceived as rewarding. This does not mean, however, that all individuals perceive equally the same rewards for a given behaviour. In this purpose, Lourenço (2003) mentions the cost-perception/gain-construction hypothesis that, for children, the anticipation of costs in prosocial acts is quite simple, unlike in antisocial acts, where the anticipation of gains appears easier than the anticipation of costs. According to his research, as children develop, their conceptions of gain/cost also develop, and go from a higher anticipation of costs in prosocial acts to higher anticipation of costs in antisocial acts: "it might be the case that the younger, less developed, and more antisocial children display more antisocial behaviour because, among other reasons, they are more likely to think of antisocial acts in terms of gain-perception or affirmation rather than cost-construction or negation" (Lourenço, 2003, p. 29). Also Steinberg (2009) mentions the hypothesis that, despite perceiving risks similarly, adolescents and adults may evaluate rewards (especially when rewards are weighted against the costs) differently, with the former attaching more value to the rewards involved in a risky situation: "what distinguishes adolescents from adults in this regard is not the fact that teens are less knowledgeable about risks, but rather that they attach greater value to the rewards that risk taking provides" (Steinberg, 2004 *cit in* Steinberg, 2009, p. 469).

Overall, the traits that may influence individuals' attitudes, perceptions and beliefs towards risk taking are included in a common aspect that has been widely pointed out by authors and researchers as characteristic of individuals with antisocial tendencies: impulsivity. Indeed, "boys who were more impulsive have a higher risk of developing antisocial behaviour than those who were not impulsive" (Carrasco et al., 2006, p. 1317). Impulsivity is clearly a consensual prominent characteristic of antisocial individuals (Carrasco et al., 2006; Caspi, 2000; Caspi, Henri, McGee, Moffitt & Silva, 1995; DeLisi & Vaughn, 2008; Dodge et al., 2008; Farrington, 2004; Fonseca & Simões, 2002; Koolhof, Loeber, Wei, Pardini & D'Escury, 2007; Moffitt, 1993, 2003, 2006; Romer et al., 2009; Romero et al., 2001; Rutter et al., 1998) and is often mentioned together with references of

lack of selfcontrol, weak constraint or failure to delay gratification. Interestingly, as a general trait, impulsivity has been found to decline from adolescence to adulthood (Steinberg et al., 2009), which may imply that, in general, as adolescents grow into adulthood, they will tend to become less prone to antisocial behaviours. In fact, it has been suggested that "normative changes in personality may play a significant role in desistance from crime and antisocial behaviour during the transition from late adolescence to early adulthood" (Blonigen, 2010, p. 98). It is also possible that "experience gained during the adolescent period may help adults to recognize the hazards of some forms of risk taking or to provide skills to constrain such activity" (Romer, Duckworth, Sznitman & Park, 2010, p.327).

Impulsivity has been related to Eysenck's Trait of Psychoticism (Colder et al., 2011), and to a smaller tendency to delay gratification, that is, a smaller tendency to choose a larger, more desired delayed reward instead of a smaller, less desired, but immediate reward. In fact, impulsive individuals tend to choose smaller immediate outcomes more frequently when facing the choice between those and larger delayed outcomes (Baumann & Odum, 2012). In turn, those who delay gratification appear to be more likely to inhibit risk taking behaviours, being more prone to higher levels of self-control (Romer et al., 2010).

Recent research has also shown that people who are more impulsive tend to overestimate the passing of time (Baumann & Odum, 2012). This aspect takes us to another very important variable that may underlie individuals' choices regarding risk taking, and may also explain the prevalence of antisocial behaviours in adolescence, that is, time perspective. In fact, adolescents tend to have a weaker future orientation when compared to adults, which may be due to the fact that, "to a young person, a short-term consequence may have far greater salience than one five years in the future. The latter may seem very remote simply because five years represents a substantial portion of her life" (Steinberg, 2009, p. 469). Time perspective may influence an individual's cognitions, attitudes and emotions towards his/her behavioural choices, and adolescence appears as a critical period for development of present and future identity (Husman & Shell, 2008), determinant for adjusted developmental trajectories. In fact, as previously mentioned, there seems to be a relation between low selfcontrol and immediate pursue of gratification, which may imply an orientation toward the present as opposed to a future time perspective (Monahan et al., 2009). In other words, while individuals who are present oriented tend to adopt preferentially short-term goals and focus on immediate life events and immediate gratification, future oriented individuals tend to have more developed planning abilities, focus on longterm goals and show concern for the future. This means that individuals who maintain a stronger future time perspective tend to be more protected against risk taking and deviant behaviours in the sense that "being future-oriented goes hand in hand with doing appropriate planning, scheduling one's time wisely, and anticipating detours and traps that might appear on the path to success" (Zimbardo & Boyd, 2010, p.147).

Conclusion

A project to address adolescent antisocial behaviours

This review makes it clear that in the antisocial phenomenon there are still many aspects to be enlightened and uncovered due to the complex nature and heterogeneity that

characterizes it. In the words of Rutter et al. (1998, p. 376): "it is quite simply meaningless to talk or try to explain, or treat antisocial behaviour as if it were of only one «type». It is different in different people, in different situations, and at different times in the life history". Indeed, the role of social environment, the role of family variables and the role of individual characteristics are still far from being understood, especially in what concerns the dynamics and interactions between such sets of factors. Clearly, if possible at all, the identification (and the criteria for categorization) of different antisocial trajectories seems to be far from determined: "there are clearly many developmental trajectories for any given type of antisocial behaviour, and there are possibly different types of developmental trajectories for different types of antisocial behaviour" (Lacourse et al., 2002, p. 921).

Having in mind the state of the art in the subject of antisocial behaviours in adolescence, we seek in future research to better clarify how such behaviours develop and manifest, and to help understanding more fully the underlying variables in play. In order to promote a more profound knowledge and to contribute as well for the explanation of the antisocial phenomenon, antisocial behaviours and interpersonal relations will be studied from a developmental framework. The importance of analyzing some factors becomes thus particularly relevant, specifically, the role of individual, family, and social variables that can be potentially identified as protective or risk factors for the occurrence of behavioural problems. Psychosocial maturity, social skills, selfconcept, personality, intellectual level, gender, family relations, and socioeconomic status will be considered, having always in mind that "a single mechanism by itself rarely functions exclusively as a unitary protective or risk factor for maladjustment" (Ayduk, Rodriguez, Mischel, Shoda & Wright, 2007, p. 375).

The aim of our project of investigation is, thus, to build a developmental explanatory model for the antisocial phenomenon in adolescence that can provide the possibility of identifying and intervening in risk situations, and that can result in the construction and implementation of prevention programs. Hence, the first issue to be addressed with the collected data is identifying what behaviour problems are manifested in adolescence and what are their characteristics. Secondly, we will identify and describe differences between individuals who manifest antisocial behaviours and those who do not, and between those who engage in different types of deviant behaviour. Gathering such information, we will try to typify different patterns of antisocial behaviour in adolescence, based on their nature, frequency, severity, and onset. The role of each of the above mentioned individual, family and social factors will then be studied, both individually and in relation to the others. We will also try to define the relative weight of each group of variables in influencing antisocial behaviours, and, finally, attempt to find the major risks for antisocial behaviours in adolescence, and what factors protect individuals from such conducts.

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Chapter 6

Future time ambiguity types within younger and older adults

Olga Y. Strizhitskaya
Marina D. Petrash
Faculty of Psychology, Saint Petersburg State University, Russian Federation
strizhitskaya@mail.ru

Abstract: The current study presents research on future time ambiguity and its relation with personality characteristics. Ambiguity of future was traditionally considered to be a stressful factor. Our study revealed that with concern to ambiguity, respondents could be divided into 3 groups: (1) those having a clear idea of their future; (2) those having no idea of the future; (3) those whose attitude is perceiving the future as ambiguous. The sample was initially divided into two: young adults (aged 17-20, n=60), older adults (aged 45-60, n=187). Different content of the future in these 3 groups was revealed. An analysis of personal characteristics and coping strategies revealed that the first and third groups, though using different mechanisms, show quite constructive and adaptive strategies of behavior, while the less adaptive group appeared to be the second. Lifespan analysis showed that though in both age samples the first and third groups are most adaptive, they are still using different mechanisms. Results showed that ambiguity remains quite an underdeveloped construct, which considers positive and negative components, among which ambiguity as unclearness of future time plays more of a negative role, and the conceptual attitude to the future as unidentified and undetermined has a positive effect.

Keywords: types of time ambiguity, adult development.

Introduction

Future time has been attracting people since the beginning of times. One of the reasons we could imagine for this is that the concept of the future possesses a potential quality. Still closely associated with reality, the future remains an extremely urgent subject matter. In the present study we are looking at the future as a part of psychological lifespan time, in other words, one's psychological lifespan time is seen as integrity of psychological past, present and future. A subjective picture of lifespan reflects different objective life events and at the same time is a totally subjective mental projection, which has different functions. The psychological future is changeable, which is what makes it an attractive resource of development and self-actualization.

Among the diversity of existing psychological time theories and theories of future time as part of it (De Volder & Lens, 1982; Miller & Brickman, 2004; Ong & Bergeman, 2004; Shmotkin & Eyal, 2003; Simons, Vansteenkiste, Lens & Lacante, 2004; Zimbardo & Boyd, 2008; Golovakha & Kronik, 1984; Nuttin, 2004; Regush, 2003), most authors

agree that one's life and motives are constructed in a certain "field", the working space of which can be measured. In dangerous and stressful situations life perspective can decrease to the closest future goals and events, but during periods of calm reflection it can be broaden to remote moments in the past and future and even go out of life time limits (Zimbardo, 2008).

Another source for the concept of future can be seen in cognitive processes that provide formation of "temporal signs". Integrity of such signs provides time perspective for behavior functioning. Results from Nuttin's (2004) studies showed that objects of time perspective are determinants that regulate behavior, and length of perspective plays a significant role in making behavior plans and projects. Western studies of future construction are, for the most part, based on a concept of "future time perspective" (FTP – De Volder&Lens, 1982). Future time perspective in this approach is considered as a cognitive and motivational concept, since it originates from setting motivational goals (Nuttin, 2004) and there can be found motivational effects determined by individual differences in future time perspective.

Ambiguity was traditionally considered as part of an extreme, stressful situation (Ross & Nisbett, 1999). And such a vision of ambiguity gave negative sense and functions to this notion. But when getting closer to this problem, we find that ambiguity is not such a one-way phenomenon. Comparing to distance, when the perspective is not clear, people are prone to overestimate distances. On the other hand, when contours are clear and obvious, people tend to underestimate the distance. Similarly, people are prone to overestimate the probability of simple events, and underestimate that of complicated ones. Another view of dual nature of ambiguity is hidden within the decision making process (Regush, 2003). While the situation is definite, non-ambiguous, we use ready concepts, notions and behavior patterns to solve a problem. Conversely, in ambiguous situations we need to upgrade our opinions, knowledge and patterns to stay efficient in our behavior; in other words, we need to develop. And here we get to the main dilemma: ambiguity causes anxiety – and that is bad; lack of knowledge, revealed by ambiguity, causes development – that is good.

In the present study we decided to take a little wider look at this problem. Our first idea was that people differ in terms of the extent to which they perceive their future as ambiguous. The second idea was that it's not just ambiguity that determines how we react, but also our personality: we supposed that different people will be experiencing ambiguity differently depending on their personal characteristics. And thus our aim was to study what the types of anxiety might be and also how people with different types would differ. Another study question was whether the same personality characteristics appear as crucial in different age periods. For comparison, we took samples from younger and older adulthood to see the most evident changes, if any.

Method

Participants

The sample consists of two subsamples: (1) 2nd year students of Saint Petersburg Universities, aged 18-20 (M_{age}=18.5 years, SD=0.43), both male and female (f=39; m=21); (2) 135 women aged 45-60 (M_{age}=51.84 years, SD=4.78). Due to the demographic

situation, we didn't manage to get a relevant male sample for the older group. Each sample was divided into three groups based on their self-estimation of "future time ambiguity". Based on this scale we ascertained a "definite" group – those for whom the future is clear, planned and obvious; an "ambiguous" group – those on the edge, for whom nothing is defined in their life, nothing is 100% sure, and who believed that you can't know what your future would be like. "Definite" and "ambiguous" participants represented extreme meanings on the scale. The last group we called "unclear" – these were people who were "not sure" and "don't know really".

Measures

Cognitive image of the future. To measure cognitive image of future time we used a modified psychosemantic method, developed by E.I. Golovakha, A.A. Kronik (Golovakha & Kronik, 1984). This method consists of 21 pairs of adjectives, which respondents measure on a scale from 1 to 6. One of the pairs – "definite – ambiguous" in concern to future time was taken to divide samples into groups.

Emotional image of the future. To measure emotional attitude to the future in the context of lifespan time we used "Emotional attitude to future" by V.R. Ginsburg, modified by V. Manukyan. Participants were asked to estimate the emotions (optimism, confidence, interest, indifference, anxiety and hopelessness) they feel for the past, present and future on a scale from 1 to 10. For study purposes new composites were computed: "positive" and "negative" attitude to time (past, present and future respectively). Indifference variable was interpreted as absence of emotional attitude.

Self-attitude. Adult self-attitude was assessed using "Method of self-attitude study" by S. Pantileev (Pantileev, 1993). Self-attitude was measured with 57 items with "Yes/No" answers falling into 1 integral, 4 global and 7 differential scale of self-attitude. For the current study purposes we used an integral measure of self-attitude as a baseline for a ratio. The integral level of self-attitude in older adults (M=.67; SD=.12) indicated a comparatively consistent positive attitude towards "self" in the present sample.

Locus of control was measured using Locus of Control Scale (LCS) developed by J. Rotter (Phares, 1976) and adapted in Russia by Bazhin et al. (Bazhin et al., 1984). *Coping behavior* was estimated using Lazarus coping-test adapted in Russia (Wasserman L.I., Ababkov V.A. & Trifonova E.A., 2010).

Results

Participants' characteristics analysis in groups revealed a interesting picture. Although we hoped to see that the "ambiguous" group would be the most adaptive and ready-to-change, the results showed another situation. For instance, "definite" and "ambiguous" were, in some sense, both "definite" groups. Only the first one believed they can plan everything, and these were people with quite a high level of locus of control. "Ambiguous" participants also had quite a clear idea of how things work in life and not making plans was more their conceptual attitude to life. Really unclear was the third group – their estimations in different spheres were contradictory and at some point that this unclearness started from their own inner lack of self-confidence.

First group. Participants who replied as seeing their future as definite, had relevantly high levels of self-attitude (.68 for younger adults; .72 for older adults) and locus of control (.71 for younger adults; .74 for older adults). Correlation matrixes in both groups revealed greater connection with characteristics of past, both emotional and cognitive. As for coping strategies, both groups preferred such strategies as accepting responsibility and control over the situation. At the same time, we found some differences between these two samples. Though general patterns were very similar, younger adults still showed more integrated correlation matrix, both between characteristics of time perspective and personal characteristics, while older adults didn't show such an integration. Still, what we can definitely say about the first group is that for them the foundation of their future time confidence is in their past – as we could ascertain for younger adults: when their past is reliable, consistent and supporting, that helps them to expect something similar from their future. For older adults we couldn't establish such a correlation, maybe because life experience of an older adult is much more complicated and older adults are not so prone to make "black-and-white" judgments.

Second group. The "Unclear" group showed quite a different picture. Most correlations between time perspective and personality characteristics were focused around present time. Another specific feature of this group was ambivalent correlations – when the same characteristic or emotion could have both positive and negative effects. Comparing to the first group, they would have slightly lower levels of self-attitudes and locus of control, albeit not big enough to be significant. Comparison of younger and older adults also showed some differences. If younger adults didn't show any correlations to past or future characteristics of time perspective, the older sample revealed some. While younger adults showed contradictory connections between how they perceived their present (or past), the older group appeared to be more consistent, and their lifetime perspective seemed to be more integrated. So, at this point we could see that perception of ambiguity of future time and its connection with personality characteristics is not stable over lifespan.

Third group. The general pattern of the third group is orientation for future time. Their correlation matrix revealed, for both samples, less correlations in general, and those few focused on the future. Still, some differences were revealed for younger and older adults. First, it's curious to mention that in the older sample, the amount of participants who fall in the third group was almost twice as big as for other groups (n_1=52; n_2=48; n_3=87), while in younger sample the amount is almost equal (n_1=23; n_2=21; n_3=16). Second, in the younger adult sample, participants from the third group had quite a differentiated correlation structure, while older adults showed a more consistent and integrated picture, with a strong accent on the future. This picture seems similar to the changes we saw in the second group, and in some ways, we could say that these changes reveal personal maturation that occurs over lifespan.

Conclusions & Discussion

The presented study was able to prove that future time ambiguity is not a homogenous phenomenon and can and should be considered with concern to its correlations with different personality traits. We found that future time ambiguity can be a kind of life attitude, or, in some sense, a motivational source that would affect the whole life management of a person.

But this type of ambiguity can't be treated as a stressful factor, on the contrary; it describes personalities flexible in their life attitudes, open to new experiences, considering their life as a set of opportunities. Still we found a specific type of future time ambiguity, which is stressful and describes people who don't have any clear idea of their future and appear to be confused – but they are not those who would tell you that their future is ambiguous, uncertain or doubtful – they would rather stay unclear in their statements.

Also, the present study revealed that the three determined groups exist both in younger and older adult samples. Though having similar patterns, younger and older adults still showed some differences. We could show that perception of future time ambiguity and its connection to other personality traits is not stable over lifespan.

At the same time, the current study had some limitations. First of all, the study design didn't let us establish if type of future time ambiguity is stable over lifespan. Having a cross-sectional study we could only reveal that all three types exist in both samples, but only longitudinal study would let us see if it could be changed over years, though, assuming that perceiving of future time ambiguity is somehow connected to locus of control and self-attitude, we would rather propose that it would be consistent within one person. Still, that would be an assumption. Secondly, in our study we used only a limited set of methods to check if the original hypothesis has the right to exist. However, there could be a much wider range of personal and behavioral characteristics that could be connected, affecting or mastered by future time ambiguity. And that is what we see as future directions for the study.

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Chapter 7

Time Perspective of Older Adults: Research and Clinical Practice

Elena Kazakina
Independent practice, East Brunswick, New Jersey, USA
ekazakina@comcast.net

Abstract: Time perspective was investigated in 103 women and men aged 65 to 91 in relation to their well-being, distress and attachment style. Unlike prior research that frequently reduced time perspective to a single time orientation (e.g., future), or to a single temporal dimension (e.g., extension – projection into the future or past), my study investigated all three time orientations, past, present and future and along multiple dimensions (density, emotional valence, extension, time continuity, and temporal balance). The findings revealed that positive functioning in late life was associated with several "healthy" components of time perspective: positive attitudes toward the present and past, a sense of connection among time orientations and a balanced perception of positive aspects of one's past, present, and future. Time perspective psychotherapy developed based on the concepts and findings of my research and the Zimbardo temporal model emphasizes the notion of balanced temporality in clinical work. The review of clinical strategies demonstrates how a time perspective approach can be integrated with cognitive-behavioral and psychodynamic interventions, enhancing the effectiveness of treatment. Clinical cases have demonstrated the alleviation of symptoms of psychological distress and enhancement of successful aging.

Keywords: older adults, time perspective psychotherapy, balanced temporality, successful aging.

Overview

Each research project has its own past, present and future. I left the former Soviet Union in 1989 before the Berlin Wall fell. I was heading into the future, leaving behind the past. In my professional life I did psychological research on actors' creativity and self-actualization. I did not know I would become a psychologist again. The experience of transition and multiple cultural adjustments compelled me to understand how people perceive time, the time of our lives. The most gripping question was whether positive adjustment may allow one to hold on to all three time orientations, past, present and future, rather than sacrifice one for another, with future orientation dominating the temporal perspective, as American culture seemed to require. Could the connection or continuity among time orientations be possible in people facing challenges of change?

Three years later, enrolled in a doctoral program and struggling to formulate the topic of my dissertation, I brought my interest to the attention of my academic advisor, Dr. Winthrop Adkins. He encouraged me to pursue it. My school, Columbia University Teachers College, had a tradition of using doctoral dissertations to examine complex and novel topics. Perhaps this approach honored the philosophy and spirit of its famous alumnae Carl Rogers and Rollo May.

My passionate personal idea when embarking on the dissertation in the early nineties was that all three time orientations, past, present and future had to be respected in the American culture and society, to enhance depth and meaning of its cultural and public life. I believed that in order to obtain a deep and comprehensive understanding of individuals' time perspective, all three time frames had to be represented in research studies.

Time perspective literature of that period by and large focused either on one time orientation (most often the future) or on a single temporal dimension (e.g., extension of projection into the future or past). That is why I felt a personal commitment for each temporal orientation, past, present, and future, to be given a full, multidimensional representation in the personal experience of time. I was also curious to know how people who were characterized by future optimism saw their present and past, and in what way positive and negative reminiscences were connected with one's view of the future and present.

My basic idea – that I tested as a hypothesis – was that the balance of time orientations and their interconnectedness (concepts of temporal balance and temporal continuity), as well as their disruptions, could be more essential and perhaps sophisticated indicators and predictors of positive and negative aspects of individual functioning than time-related phenomena associated with only one particular time frame, such as positive future outlook.

My interest in older adults stemmed from the courses on adult development and aging I took at Columbia [1]. The experience of late life was shown to have a dramatic and touching streak that reminded me of my work with actors. Also, my interest in older Americans – whether in contacts on a subway or during my externships – pointed out a new path of professional direction. I felt a strange level of comfort and kinship with the older generation as though it represented something dear to me, something I left behind. The "Greatest Generation's" experience in World War II resonated with the history of my family in Russia during the war, the memory of which remained very close to our present-day collective consciousness. Also, aging appeared to be a great model for transition – not from country to country but from one developmental stage to another. The key element of transition – its inevitable losses and gains – became a dominant theme of my then present.

Working on my dissertation "Time perspective of older adults: relationship to attachment style, psychological well-being and psychological distress" helped me to integrate and balance my own past, present and future. My dissertation sponsor, Professor Elizabeth Midlarsky, not only guided me through the process but also suggested that I examine the relationship of temporal phenomena with a very important but little known variable, attachment style (capacity for close, trusting and enduring relationships). The study of this aspect of functioning in late life produced exciting results that resonate with new research about balanced time perspective and emotional intelligence (Stolarski, Bitner & Zimbardo, 2011). My interest in combining research and clinical insights brought me forward to this day, solidifying the continuity of my professional choices.

Now, the field of time perspective research is flourishing. It has endured a significant shift since the publication of influential work by Zimbardo and Boyd (1999). The authors offered a valid, reliable and comprehensive time perspective measure and a solid theory emphasizing the importance of balanced time perspective for individuals' optimal

[1] I would like to thank Nan Kramer, PhD, for sparking my interest in aging and for collegial support and friendship in my further career

functioning. In fact, I felt that my approach was validated and was amazed by the similarities in our conceptualization of the importance of all three time frames, past, present and future in time perspective.

It is most gratifying to see that the balanced time perspective concept has found a strong following: the new interesting studies focus on more accurate measures of the balance of time orientations and its relationship with more sophisticated aspects of positive functioning (Boniwell, 2011; Drake, Dunkan, Sutherland, Abernethy, & Colette, 2008; Zhang, Howell, & Stolarski, 2012).

However, older adults are rarely the object of time perspective research and, particularly, of balanced time perspective studies. The most notable exception among the few inquiries that have included older adults is the recent publication by Desmyter and De Raedt (2012). With the world population aging and living longer than ever before, it seems absolutely essential for psychologists to address the themes of time and temporality that are critical to discussions of aging (Hendricks, 2001).

Further, in this article, I will describe the theoretical background and major findings of my original study. Then I will demonstrate how my research informed my clinical practice: I will delineate the notion of balanced temporality and how it was enriched by the work of Zimbardo and colleagues. Also, I will explain the temporal focus of my clinical practice, examining cognitive-behavioral and psychodynamic interventions within the context of time perspective counseling and psychotherapy. The case discussed will demonstrate a reduction of symptoms and enhancement of successful aging in clinical work with older adults.

Research

Theoretical Background

My doctoral study was designed to determine the time perspective of older adults and its relationship to their attachment style, psychological well-being and distress.

The focus of the study was on the construct, "time perspective," which presents an individual's "characteristic way of relating to the psychological concepts of past, present and future" (Block, 1989, p. 65). Time perspective was viewed as a facet of the subjective experience of "lived time" understood as personally meaningful time of one's life (Minkowski, 1933/1970, Gorman & Wessman, 1977).

One of the central theoretical concepts upon which this study was based and which continues to illuminate my clinical work is the concept of temporal integration. It is understood as "the integrity of time based on the inner correlation and coexistence of its parts" (Kummel, as cited in Cottle, 1976, p. 15). Lewin's (1942/1997) understanding of time perspective, as "the totality of the individual's views of his psychological future and his psychological past existing at a given time" (p. 222) also underlines time perspective's integral character.

However, research – especially prior to the groundbreaking publication of Zimbardo and Boyd in 1999 – has rarely focused on time perspective as combining all three time referents: past, present, and future. Previous studies by and large selected one time orientation for investigation (see literature review in Kazakina, 1999). Most frequently

(regardless of the age group being studied), the focus was on the future orientation, which in Western and particularly American society reflects the cultural value of progress and achievement (Gorman & Wessman, 1977; Kastenbaum, 1964). Another limitation involved a single measure approach to time perspective; i.e., focusing on one temporal dimension, for example, on extension – projection into the future or past.

In my study an investigation of past, present, and future orientations was conducted in one population and along multiple dimensions. A multiple dimension approach was strongly recommended in the literature (Jones, 1994), but it was rarely applied in actual studies (Carr, 1985; Kastenbaum, 1982; Rappaport, Enrich, & Wilson, 1985). Each time orientation was examined along the dimensions of density, emotional valence, and extension (i.e., number of experiences, thoughts and feelings allocated to each temporal frame, their emotional tone, and length of period over which they are projected into the past or future).

In addition, my study distinguished two rarely examined variables -- temporal continuity and temporal balance. Both characterized time perspective as a whole, expressing interconnectedness and coexistence of the three temporal regions, also known as temporal integration.

Temporal continuity was understood as a person's tendency to perceive his or her past, present, and future as meaningfully connected. Literature review pointed out only a few studies (samples of younger adults) where temporal continuity presented an object of investigation. Then, it was found to be positively correlated with intelligence, achievement needs (Cottle, 1976), ego strength, parameters of self-actualization (Getsinger, 1975), purpose in life and positive evaluation of the present (Robertson, 1978), creativity and positive perception of time (Yonge, 1975). However, existing research revealed a striking paucity of empirical data on temporal continuity in old age.

Temporal balance was conceptualized in my study as the relative equilibrium of thoughts and feelings allocated to recollecting the past, experiencing the present, and dreaming and planning for the future.

Traditionally, a dominant focus on futurity was regarded as an indicator of adaptation and mental health (Kahana & Kahana, 1983; Schonfield, 1973; Seginer, 2009), but the findings in this area were inconsistent (Boniwell, 2011; Cameron et al., 1977-78).

By contrast, my study emphasized the importance of balanced temporal orientations for psychological health based on conceptualization of the "open mind" (Rokeach, 1960), "healthy" time line (Rappaport, 1990), time competence (Shostrom, 1968), and "openness" of an individual to past, present and future (Nuttin, 1985, Rappaport, 1990).

One goal of this inquiry was to provide a comprehensive, i.e., multidimensional picture of time perspective of older adults. Another goal was to determine the relationship of the time perspective of older adults to their attachment security (capacity for close enduring relationships), psychological well-being, and distress. Although the importance of well-being and distress is well-documented in the literature (Birren, Sloane, & Cohen, 1992; Ryff, 1989), their relationship to all three time orientations in old age has been insufficiently explored. Attachment relationships in later life only recently have been gaining attention in the research (Antonucci, 1994; Browne & Shlosberg, 2006). Issues of connections between attachment security and time perspective implied in theory (Erikson, 1985) had hardly been investigated among younger adults or older adults, thereby presenting a new area for exploration in this study.

On the basis of the literature review on time perspective dimensions and their correlates in the area of personality functioning, it was postulated that older adults whose time perspective was characterized by greater continuity among time zones, greater balance of time orientations (on the dimensions of density, emotional valence and extensions), higher positive emotional valence of time zones, and greater extensions, would be securely attached and would report higher well-being and lower distress.

Method

Sample

Participants of this predominantly Caucasian sample were 103 community-dwelling older adults residing in the New York metropolitan area. Their age range was from 65 to 91 years. It included 78 females and 25 males. Participants were volunteers recruited from senior citizens' centers, housing complexes and community organizations.

Procedure

Data were collected during a one-time interview session that lasted an average of two hours.

All psychological instruments were administered in interview format, although they are paper-and-pencil questionnaires that are usually self-administered. This approach presents an effective method of data collection with older respondents (Midlarsky, 1992; Reed, 1991).

Measures

Study variables and measures are listed in Table 1. Here I would like to point out a few aspects of the use of the measures of Temporal Continuity and Temporal Balance.

Temporal continuity, ability to see past, present and future as meaningfully connected, was assessed by the Time Competence Scale, one of the two major subscales of the Personal Orientation Inventory (POI) (Shostrom, 1968). POI was designed to assess an individual's level of self-actualization. Time Competence Scale measuring an individual's ability to tie the personal past and the future to the present (Shostrom, 1968) was very infrequently correlated with the time perspective dimensions (e.g., Getsinger 1975). Also, older individuals seemed to be neglected in self-actualization research: both the Time Competence Scale and the whole inventory, POI, were rarely used in later life. The relatively recent implementation of the Time Competence Scale (Boyd-Wilson, Walkey, & McClure, 2002) included again only young adults and used the scale as a measure of the dominant present rather than the connectedness among past, present, and future. An important reminder is that the original conceptualization of time competence (Shostrom, 1968) indeed highlighted the importance of the present, but the essence of "a Time Competent orientation" according to Shostrom (1968), was represented in the POI statement " For me, past, present and future is in meaningful continuity" (p.19).

Temporal balance has been rarely operationally defined or directly measured, and its operational definitions continue to challenge researchers of balanced time perspective (e.g., Zhang, Howell, & Stolarski, 2012). One of the goals of this study was to measure the degree of balance of time orientations for each individual and the total sample of older adults. The notion was that a more even allocation of one's experiences and feelings over the three time periods (i.e., low variability of past, present, and future scores) was associated with a higher balance of orientations. The balance of time orientations was represented by the indices of balance, calculated on the basis of temporal dimensions, density, emotional valence, extension, and thoughts focus. Each index of balance was calculated as a standard deviation of past, present, and future scores from their mean.

Table 1 – *List of Variables and Measures by Categories*

TIME PERSPECTIVE VARIABLES ("Predictors")	Measures
	The Time Reference Inventory (Roos & Albers, 1965)
Density (Past, Present, Future)	Number of items referred to a time zone
Emotional Valence (Past, Present, Future)	
Positive	Number of positive items referred to a time zone
Negative	Number of negative items referred to a time zone
Neutral	Number of neutral items referred to a time zone
Extension (Past, Future)	Averaged differences between respondents' chronological age and their estimated age on the items selected (a) as past-related and (b) as future-related.
Emotional Valence: Positive	
Positive Time Attitude (Past, Present, Future)	The Time Attitude Scale (Nuttin, 1985)
Time Continuity	
Time Competence	The Time Competence Scale (Personal Orientation Inventory) (Shostrom, 1968)
Temporal Balance	
Temporal Balance of Focus Index	The Temporal Balance Scale (Adapted Kuhlen & Monge, 1968)
Balance of Density	The Time Reference Inventory (TRI)
Balance of Emotional Valence	TRI and Time Attitude Scale
Balance of Extension	The Time Reference Inventory
	Indices of temporal balance based on the measures of density, emotional valence and extension calculated as a standard deviation

OTHER STUDY VARIABLES ("Criterion")	
Attachment Style	The Revised Adult Attachment Scale (Collins, 1995)
Psychological Well-Being	
Affect Balance	The Affect Balance Scale (Bradburn, 1969)
Life Satisfaction	The Life Satisfaction Index – Z (Wood et al., 1969)
Psychological Distress	
Depression	The Center for Epidemiological Studies Depression Scale (Hertzog et al. 1990)
Global Index of Distress	Brief Symptom Inventory (Derogatis, 1993)

Study Design and Statistical Analysis

The design of the study was correlational. The associations of time perspective variables and measures of attachment style, well-being, and distress were assessed in multivariate analyses where the impact of demographic factors was controlled. On the basis of the literature review, time perspective dimensions were conceptualized as predictor variables, whereas attachment, well-being, and distress were designated as criterion variables.

Major Findings

Findings that are most relevant to the current research on time perspective and clinical practice are reported in this section.

Time perspective and attachment security

My study documented that older adults who were securely attached (those with close and trusting interpersonal connections) had the more balanced time orientations and experienced a greater sense of connection among personal past, present, and future. Thus attachment security was most closely related to the essential aspects of time perspective: balance and continuity of past, present and future. In this study these variables were found to be independent from each other, presenting two distinct manifestations of temporal integration.

It should be noted that only one type of temporal balance contributed to attachment security: the balance of positive experiences, thoughts and feelings across time regions (emotional valence measure derived from TRI, Time Reference Inventory, Roos & Albers, 1965).

The association between a disturbed time perspective and problems with close relationships is illustrated in the case of a 74-year old widow with an insecure attachment style who complained about being surrounded by the "wrong and shallow people." She

referred all statements (TRI) describing positive experiences and feelings to the past and experienced the present as an island unrelated to the past and future.

Another finding related to the role of education in attachment security. Securely attached older adults were found to have more years of schooling. It should be added that the more educated elders in this study also had greater time continuity, i.e., a higher score on the Time Competence Scale. Time competence or ability to use one's past in understanding the present and planning for the future is an aspect of self-actualization (Shostrom, 1968).

Thus, the empirical findings obtained in my study pointed out connections among rarely examined phenomena of late life: secure attachment, balance and continuity of time perspective, and level of educational attainment.

The empirical link between older adults' time perspective variables of continuity and balance, and attachment security, may be derived from their common root in the quality of mothering, "When a child is hungry, it cries and extends its arms towards its nurse: this is the seed of the idea of future" (Guyau, cited in Droit & Pouthas, 1992, p. 45). Indeed, connection between secure attachment in children and early development of time concepts was noticed in the literature (Fraisse, 1975;Gorman & Wessman, 1977; Melges, 1982). However, it was unclear whether and how these tendencies persisted and interacted in adulthood and aging.

My interpretation of these results emphasized that attachment security provided a growing individual with a secure base (Bowlby, 1967) from which it was possible to explore the world, eventually pursuing higher goals in self-actualization (Maslow, 1970). The manifestations of secure style, such as confidence, positive attitude towards self and others (Antonucci, 1994), higher educational attainment and temporal continuity – the ability to see meaningful connections in one's past, present and future – seem to express different aspects of positive functioning of individuals.

Current research has not yet addressed the issues of attachment phenomena and time perspective. However, a recent innovative theoretical and empirical link establishing a positive connection between balanced time perspective and emotional intelligence (Stolarski et al., 2011) resonates with my results. The connections between emotional intelligence and secure attachment pointed out in the literature (Lopez, 2011) may enable further research which brings these phenomena into the studies of time perspective. From my point of view, such inquiry may deepen our understanding of positive temporality and strengthen "the scaffolding supporting optimal human growth and development" (Lopez, 2011, 406).

Time perspective and psychological well-being

The analysis of the relationship of time perspective variables to psychological well-being revealed the importance of positive attitudes of older adults toward their present, and their past as measured by Nuttin's (1985) adjectives scales (T.A.S.).

The supplemental multivariate analysis revealed that the strongest predictor of life satisfaction was positive present attitude followed by positive past (Kazakina, 1999, p.206). Positive present was also the strongest predictor of affect balance, another measure of psychological well-being.

The importance of positive feelings about one's present and one's past for life satisfaction documented in this study was consistent with Erikson's (1985) stage of ego integrity, which emphasizes acceptance of one's present as well as one's past life with its triumphs and disappointments. Also, one of the aspects of well-being postulated by Ryff (1989) was self-acceptance, which involves positive attitudes towards current self as well as positive feelings about past life. In addition, empirical findings within socioemotional selectivity theory (Carstensen, Isaakowitz, & Charles,1999) pointed to the increasing meaning and satisfaction that older adults experience in the present due to their awareness of time left in life, which restructures personal choices.

Time perspective and psychological distress

The main time perspective variables contributing to the psychological distress were negative feelings about the present, and an imbalance of positive experiences, thoughts and feelings across time zones.

Psychological distress was conceptualized in this study as a broad range of negative affect, including depression and distressing psychological symptoms (e.g., anxiety). Depression was measured by the CES-Depression Scale (Radloff, 1977) and global index of distress obtained from the Brief Symptom Inventory (Derogatis, 1993).

The findings showed that depression was most related to negative emotional valence of present orientation, followed by imbalance of positive experiences over the three time zones. Global distress was exclusively related to the imbalance of positive experiences across past, present and future. Those older adults who failed to find positivity in each temporal orientation were at risk of heightened feeling of psychological distress.

Clinical Practice

The Notion of Balanced Temporality

The theory and findings of my study conducted in the late 90s laid the foundation of the time perspective approach in counseling and psychotherapy that I have been applying for more than 13 years. My clinical work incorporated a conceptual framework of time competence and self-actualization (Maslow, 1970; Shostrom, 1968). It was also informed by Temporally Oriented Psychotherapy (Rappaport, 1990) and later by the seminal contribution of Philip Zimbardo and colleagues to time perspective theory and research (Zimbardo & Boyd, 1999, Boniwell & Zimbardo, 2004; Boniwell, 2011).

Balanced temporality was initially defined as a relatively balanced combination of past, present and future orientations in the individual's time perspective that was viewed as an essential part of the subjective experience of time (Kazakina, 1999). My approach was based on the conceptualization of the balance of temporal orientations necessary for temporal integration and psychological health (Rappaport, 1990; Shostrom, 1968).

I later extended this concept to include those aspects of time perspective that were found in my research to be the most relevant temporal correlates of positive functioning in late life. These "healthy" time perspective variables involved a specific type of temporal

balance – a balance of positive experiences, thoughts and feelings that older adults referred to their past, present and future. Other dimensions included temporal continuity – a sense of connection among past, present and future, positive feelings about the present, and positive feelings about the past. I suggested that these aspects of temporal experience needed to be evaluated and enhanced in counseling and psychotherapy with older adults. Positive future is a part of this formulation but its role in late life has to be clarified further due to inconsistent findings.

Further development of the notion of balanced temporality incorporated Zimbardo and Boyd's (1999) dynamic understanding of "balanced time perspective" associated with positive functioning. The balance was viewed not only as a state but also as an ongoing process of *balancing* (emphasis added; Boniwell & Zimbardo, 2004). The key part of this process is the flexible switching of temporal frames among past, future and present, depending on situational demands and personal resources to avoid temporal bias (overuse or underuse of any particular time orientation) (Zimbardo & Boyd, 1999, p. 1272).

Time Perspective Psychotherapy

Time perspective therapy can be defined as psychotherapy in which temporal focus – awareness of psychological concepts of past, present and future, and their interaction – underlies clinical interventions. The notion of balanced temporality is critical for setting clinical goals in treatment and psychotherapy. "If psychotherapy may be considered to be a process of value re-orientation for the patient, a significant step can be made in helping the client to realize the proper balance between past, present, and future orientations." (Shostrom, 1968, p.19).

However, based on my findings, I specify the temporal balance as a balance of the positive experiences across temporal regions, past, present and future (Kazakina, 1999). It is also important to emphasize that in the course of treatment I use temporal balance "as a yardstick of health in trying to ascertain the relative progress of a given patient" (Rappaport, 1990, p.189).

The first step for clinicians has to include evaluation of their own cultural and personal values about the concepts of past, present and future. Are there any implicit "favorites" or, as Gorman & Wessman (1977) noted, "good guys versus bad guys?" Thomas Jefferson wrote once that he liked dreams of the future more than the memories of the past. This view may have been forever embedded in American cultural tradition. However, the basic attitude that followed from my study was based on respect for each temporal region and the enhancement of its balanced participation in an individual's functioning.

Another important step is to gain awareness of how we view the temporality of older adults. Are there any preconceptions and stereotypes about the experience of time in old age, such as "the elderly live only by their memories" or "old people have no future"?

Multidimensional approach to time perspective applied in my study has become a part of my clinical work, both in the evaluation phase and as treatment unfolds. It means that I have to understand how patients think and feel about each period of their lives – past, present, and future – and about their connections or disconnections. To what extent is each time period full or empty? What is the emotional tone associated with different aspects of each zone? How far in both directions – past and future – can a person see? What is the

relative importance of past, present, and future for each individual? Can older clients find positive experiences in each temporal region in a relatively even fashion? If past, present, and future are split or disconnected, if one temporal zone "outweighs" another, or if one zone is excluded from an individual's perspective, this may signal a problem which needs to be dealt with in psychotherapy. "Problems" in time perspective could be triggered by various developmental issues of late life, such as declining health, widowhood, death of friends, or a required change of place of residence.

Clinical Case

The highlights of the psychotherapy case demonstrate the temporal focus of my clinical approach and how it is integrated with cognitive-behavioral and psychodynamic interventions.

Mrs. Smith (not her real name) is an 82-year-old Caucasian retired professional woman, a widow for 16 years who was looking for psychological services for the first time in her life. She reported anxiety, worry about her health, depression, and painful tension in the neck area. These symptoms were precipitated by the death of two of her close friends due to relatively sudden and serious illness. She experienced her present as purposeless, empty and lonely. Her spontaneous comments related to the recent past, with no references to the future.

An initial assessment registered her disconnected time orientations, negative feelings in the present, and exclusion of the future from her present psychological field. A strong therapeutic alliance was instrumental in creating first experiences of a positive present in which the patient felt connected and understood. The present became the focus of the clinical interventions.

I chose cognitive-behavioral strategies to help Mrs. Smith identify her automatic thoughts triggering depression, and also to help her master relaxation techniques to alleviate muscle tension and anxiety. Mrs. Smith's discussion of her tension pain elucidated her important insight. She realized that her pain subsided during a telephone conversation in which she gave professional advice and mentoring to her younger colleague.

Then, we shifted the focus to the past by discussing her successful work history. It allowed Mrs. Smith to discern her strengths and start making plans about resuming her important social connections, as well as consider meaningful volunteer work in the near future. This intervention may give an example of enhancing a patient's time continuity and sense of connections between her past, present and future. However, in order to solidify the growing temporal integration and address the issue of depression and loss, the patient's powerful emotional reaction to the death of her friends had to be revisited.

Psychodynamic intervention focused on the patient's strong emotional response, "being threatened" because of the death of her friends. Her associations took her to a similar emotion in the distant past. Mrs. Smith's mother died when she was 2 years old. She recalled that when she was about 10, her caretaker wanted to send her to distant relatives. The patient recalled feeling severely threatened by this. This recollection brought to light the nature of the patient's vulnerability and distress, helping her better understand her feelings in the present. Although my initial hypothesis for the patient's symptoms was "death anxiety," therapy revealed that her symptoms were triggered by fears of abandonment and loneliness in the present rather than of death, in the future.

One aspect of therapy is of importance here: the creation of patient and clinician "common psychotherapy past." Mrs. Smith expressed fascination with a therapy process that instigated her "mental connections" as well as with the effect of her insights on her mood relieving her depression and anxiety. When comparing her initial severe distress to her significant improvement, Mrs. Smith pointed out "the road she traveled" and recognized the impact of therapy as "returning back to herself."

This recent positive past helped enhance the patient's self-esteem. She became more responsive to my "new round" of refocusing her on the present. The importance of Mrs. Smith's current close relationships was continuously emphasized in sessions and her present became gradually populated with resumed warm interpersonal connections (with step-children, neighbors, churchgoers and former colleagues). The treatment enhanced her attachment security. The emerging "hedonistic present" (Zimbardo & Boyd, 1999, 2008) surfaced in Mrs. Smith's playful and humorous comments. One day she shared a compliment she received: she was greeted as "a cover girl" in the gym, where she renewed her membership.

Once her positive present was reinforced, shifting to the other time zones, past and future, became more fluid. She spoke about positive aspects of her past including her marriage and raising her stepchildren. She enrolled in a computer class "to become a better volunteer" during upcoming presidential elections. It turned out that Mrs. Smith had been a "political junkie" all her life. The assessment of progress reached in treatment pointed to the increased integration of positive experiences across past, present and future. This is a "healthy" aspect of time perspective positively associated with attachment security and negatively connected to psychological distress (Kazakina, 1999).

It should be noted that the goals of symptom reduction and enhancement of positive functioning are often theoretically separated (Jorgensen & Nafstad, 2004). However, in clinical practice they can be intertwined. While patients are overcoming symptoms of immediate distress, they acquire growing sense of efficacy, and connection with others, leading further in treatment to their greater vitality, self-actualization and overall engagement with life. Engagement with life, one of the key features of successful aging (Rowe & Kahn, 1998), is viewed as essential for older adults "continuing" their "valued personal activities" (Williamson & Christie, 2011, p.168). To recreate this continuity when it is disrupted is one of the goals of time perspective therapy. This goal can be accomplished only when a person's ability to keep in mind past, present and future (Kastenbaum, 1965) is restored.

I view temporal flexibility – ability to switch from one temporal frame to another (Boniwell & Zimbardo, 2004) not only as a goal for the patient to acquire but also as a tool for the clinician to use. Keeping in mind a patient's past, present and future while moving swiftly to the time orientation in need of immediate attention, and choosing the most appropriate clinical intervention, is at the core of my time perspective focused therapeutic approach.

Conclusion

This article focused on research and clinical practice with older adults, who are often underrepresented in the time perspective studies despite their dramatically growing numbers and the urgent need to comprehend the meaning of old age in the global economy (Carstensen, & Fried, 2012).

I have shown how my professional decisions have been affected by the need to establish time continuity, a sense of connection among personal past, present and future.

The goal of my research was to determine how older adults viewed their past, present, and future and how their time perspective related to their attachment security, well-being, and distress. In contrast to previous studies, which mostly searched for the predominant temporal orientation of an individual and often neglected the less salient time zones, or which emphasized the role of the future, I examined all three time orientations along multiple dimensions and determined the relative significance and balance of past, present, and future in the time perspective of older adults.

The study highlighted two global time perspective variables, time continuity and temporal balance; they seem to reflect distinct aspects of temporal integration, understood as the human capacity to extend beyond the present moment and to make connections among time regions (Melges, 1982).

The findings established the "healthy" components of the time perspective of older adults associated with their positive functioning: positive attitudes to present and past; sense of connection among time orientations; relatively balanced perception of positive aspects of past, present, and future. This implies that all three time regions can be available to older individuals, and thus their functioning becomes enriched by the recollected past, the evaluated present, and the anticipated future. In this case, positive aspects of past, present, and future are available or accessible (Jones, 1994) to older individuals. This appears to be a "fully-functioning" time perspective in old age.

My inquiry also extended time perspective research to the area of attachment security in old age, establishing little known connections among essential aspects of late life–the subjective experience of time and the capacity for trusting, enduring relationships. The role of continuity and balance in older adults' perception of their past, present and future in their attachment security, and potential impact of these phenomena on self-actualization was highlighted.

This chapter presented the notion of balanced temporality that became a theoretical framework for my approach in time perspective psychotherapy with older adults. I extended the concept of balanced time perspective (Zimbardo & Boyd, 1999) to clinical practice and demonstrated that temporal flexibility can be viewed as a goal for patients to achieve and a skill for clinicians to use.

The case examination pointed out the temporal focus of clinical strategies and their interplay with cognitive-behavioral and psychodynamic interventions to increase effectiveness of treatment and enhancement of successful aging.

I believe the integration of time perspective research and clinical work is a promising development, which improves the quality of psychological services and helps the rapidly growing population of older adults to age successfully.

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Chapter 8

Influence of early stressful life events on the future expectancy changes and current addictions in homeless people

Fernando Fajardo Bullón
Department of Psychology and Anthropology, Extremadura University, Spain
fernandofajardo@unex.es

Eduardo J. R. Santos
IPCDVS, Coimbra University, Portugal
eduardosantos@fpce.uc.pt

Abstract: Stressful life events experienced at an early developmental stage could have a negative influence on the rest of people´s lives. For this research 49 homeless people were selected from two Spanish foster care centres. They were interviewed for three months and divided in two groups, using a Statistical Latent Classes Model, according to the following variables: *number of stressful life events experienced before sixteen years old, having a current addiction and future changes expectancy*. Homeless people with high probabilities of having between 1 and 5 stressful life events before sixteen, (0.704; 70.4%), had a higher probability of having a negative expectation of future changes in their lives (0.77; 77%) and presented a higher probability of not having current addictions (0.763; 76.3%). However, individuals with higher probability of having more than 5 stressful events (0.662; 66.2%) had a higher probability of having a positive outlook about change of situation in the future (0.758; 75.8%) and presented a higher probability of having a current addiction (0.614; 61.4%). According to these data, a relationship between past, present and future exists. Therefore, it would be advisable to anticipate addiction prevention policies or motivation therapy according to the number of stressful life events experienced before sixteen.

Keywords: homeless people, stressful life events, addiction, future expectancy.

Introduction

The year 2010 was designated as the "European Year against the Poverty and the Social Exclusion". In order to study the situation of the most disadvantaged people, a research project about the homeless people in the Spanish cities of Mérida and Badajoz was started (Fajardo, 2010). In this research, in addition to others variables, the influence of the stressful life events were analyzed.

The stressful life events are the key events in people´s lives that they recognize as important in their development. It is known the association between stressful life events and the increased likelihood to present a psychopathology. Negative life events could predict the course of depression (Paykel,2003) and the presence of anxiety disorders but not the maintenance of these ones (Kendler, Hettema, Butera, Gardner, & Prescott,

2003b). Stressful life events give rise to a higher probability of present depressive and anxiety symptoms, over and above the effects of age, gender, education and size of the social network, duration of last episode, positive life events and baseline symptom severity. (Paykel, 2003; Spinhoven et al, 2011).

Some research associates the occurrence of stressful events with drugs' use as a way of coping with these events and their emotional consequences (Thompson, 2004). It is essential to analyze if the stressful life events in homeless people's childhood and adolescence could be related to the higher likelihood of having a current addiction and future changes expectancy. Thus, we tried to find out specifically about the stressful events in childhood and adolescence because the childhood stressful events could lead to increased vulnerability to recent life events (Sandín, 2003). Thereby, as a person experiences more stressful life events in his/her life, the emotional impact of each of them may be higher. This way, it is essential not only to know about the stressful life events lived by homeless people, but also to provide psychological therapies by specialists to help overcome any future disorders. Therefore, the aim of this research was to analyze stressful life events experienced in homeless people before sixteen and to analyze their influence on having a current addiction and future changes expectancy.

Method

Sample and procedure. 91 homeless people were randomly selected during the months of July, August and September 2009, from a 1020 homeless people estimated population who were living during the last year in the Caritas foster care centres of Badajoz and Merida cities. The sample had a precision of 0.09 for a confidence level of 95% and in the most unfavorable conditions ($p = q = 0.5$). 49 people were selected from the initial sample due to the specific fields researched for this particular study.

Questionnaire. In order to analyze stressful life events, the List of Threatening Events Questionaire (LTE-Q) (Brugha & Cragg,1990) was readjusted and expanded. The LTE-Q has shown good test–retest reliability ($k = 0.78–1.0$ on all categories except 'something you valued was lost or stolen', where $k = 0.24$), high agreement between participant and informant ratings ($k = 0.7–0.9$), as well as good agreement with interview based ratings (sensitivity = 0.89; specificity = 0.74; Brugha & Cragg, 1990). The LTE-Q was extended with some items according to the experiences lived in the last ten years in the foster care centres and with questions about having or not having a current addiction and future changes expectancy were added.

Statistical Analysis. The 49 homeless people's data were divided into groups in the following way: item1= stressful life events before sixteen (1= none; 2= from 1 to 5 stressful events; 3= more than 5 stressful events). Item 2= having current addictions (1= yes; 2= no) and item 3= future changes expectancy (1= yes; 2= no). In the statistical model used the manifest variables and latent variables are categorical, thus we decided to use a Latent Class Model (LCM). This Model assumes that the population of individuals is divided into a number of exclusive and exhaustive latent classes, considered as categories. Accordingly each individual belongs exclusively to a latent class.

Results

When we applied the latent class model, we identified a model with two latent classes. The estimated results are presented in the next table.

Table 1 – *Characteristics of the latent class model*

	Latent Class 1				**Latent Class 2**		
	Prob. Latent Class =0.276 (sd=0.147).				**Prob. Latent Class =0.724 (sd=0.147).**		
	Catg. 1	Catg. 2	Catg. 3		Catg. 1	Catg. 2	Catg. 3
Item 1	0.296	**0.704**	0.000	Item 1	0.000	**0.662**	0.338
	(0.188)	(0.188)				(0.101)	(0.101)
Item 2	0.237	**0.763**	-------	Item 2	**0.614**	0.386	-------
	(0.184)	(0.184)			(0.102)	(0.102)	
Item 3	0.230	**0.770**	-------	Item 3	**0.758**	0.242	-------
	(0.201)	(0.201)			(0.106)	(0.106)	

Pearson q=1.29; (d.f.=1), Δ=0.256

The two latent classes model was accepted according to the Pearson contrast. As we can see in table 1, the homeless people had a probability of 0.276 (27.6%) of belonging to the latent class number 1 and a probability of 0.724 (72.4%) of belonging to the latent class number 2.

The homeless people who belonged to the latent class number 1 had a higher probability of having between 1 and 5 stressful life events (0.704; 70.4%), a high probability of not having a current addiction (0.763;76.3%) and a high probability of having negative expectation of future changes in their lives (0.77;77%). In contrast, homeless people who had a high probability of belonging to the latent class 2, presented a high likelihood of having more than 5 stressful life events (0.662; 66.2%), a high probability of having a current addiction (0.614; 61.4%) and a high future changes expectancy (0.758;75.8%).

Conclusions and Discussion

It has been proved that those people who experienced between 1 and 5 stressful life events before sixteen do not have a current addiction, but have a negative expectation of future changes in their lives. This shows that these stressful events do not necessarily cause current addictions but might eventuality cause great despair. One possible explanation resides in the association between stressful life events and the presence of depressive disorders that could be related at the same time to the negative perception of future changes (Kim, Conger, Elder & Lorenz, 2003; Kraaij et al. 2003).

Moreover, those homeless people, who had more than 5 stressful life events had a higher probability of having a current addiction. These data agree with previous research that confirms the relationship between these events and the higher probability of substance use (Martínez, Fuertes, Ramos & Hernández, 2003). These results, coupled with the possible risk expossure of homeless people when they were in the adolescent stage, demonstrate that it is possible that an overload of negative events adversely affects the ability to cope with these events and prevent an effective response to stress. According to our results, that effects increases the probability of starting with substance use in an attempt to escape from the situation (Jiménez, Méndez & Hidalgo, 2008, Fajardo, 2011). Even so, these homeless people have a positive outlook about the change of the situation in the future, although they might turn to substance observe in a high percentage.

A possible solution for this population might reside in the prevention of the stressful life events and substance use through preventive interventions in the household, where parents could se trained in the basic abilities that support their children at both the infancy and adolescence stages (Lochman & Steenhoven, 2002). This way, the emotional attachment could be improved in order to create safe emotional bases that could be useful to cope with the stressful situations in the future as well as in the development of resilience (Gómez, Thompson, & Barczyk, 2010).

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PART 2

THE RELATIONSHIPS OF PERSONALITY AND AFFECTIVE PROCESSES WITH TIME PERSPECTIVE

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Chapter 9

Time Perspective orientation and Big-Five dimensions: An exploratory study in the Portuguese population

Pedro Figueira
Rui Bártolo-Ribeiro
ISPA – University Institute / CAP, Portugal
pfigueira@ispa.pt
rbartolo@ispa.pt

Abstract: Zimbardo and Boyd (1999), with their Time Perspective scale, have shown relations between the time perspective's dimensions and Big-Five's dimensions. Recent studies (Dunkel & Weber, 2010) show the existence of such relations. The present study used the Portuguese version of Zimbardo Time Perspective Inventory (Ortuño & Gamboa, 2008) and the short version (10 itens) of Big Five Inventory (Rammstedt & John, 2007), adapted to Portuguese by Bártolo-Ribeiro and Aguiar (2008). Both scales were applied to 326 participants in two different application contexts (online and face-to-face). The results shows that different temporal perspectives are associated to different personality dimensions, confirming in a global way the results already found in previous studies with other personality questionnaires, namely significant correlations between negative past and neuroticism; positive past and agreeableness; hedonist present with extraversion; fatalist present with conscientiousness (negatively); and future with conscientiousness.

Keywords: time perspective, big-five, ZTPI, connection

Introduction

"It's all a matter of time"

We can remember our past experiences, we can think of what we are doing now, and we can imagine what we will do in the future. All of these processes leave traces in our mental organization, which may influence our personality organization.

In Zimbardo's & Boyd's (1999) Time Perspective Theory, the time orientations (past, present and future) are viewed as a basis dimension of human functioning. In this line, it is defended that all the lived experiences by an individual are codified in specific time frames. If there were no such time frames it would be impossible for the individual to maintain an order and coherence of the events.

The importance of these time frames does not restring the codification, storage and the coherent retrieval of living experiences, but also involves the formation of expectations and objectives which influenced decisions, judgments and actions.

The balance between these time frames may be thinking as a differentiating variable between the individuals, existing certain situations in which the individual focuses more

in information contained in the past, present or future frame. Zimbardo, Keough & Boyd (1997) state that when this focus process is cronical in one of the time frames, it can be considered as a personality trait.

Zimbardo & Boyd (1999) have created the Zimbardo Time Perspective Inventory (ZTPI) for theory validation. Despite their instrument had been developed for measuring 3 dimensions, they identified 5 dimensions: negative past, positive past, hedonist present, fatalist present and future. The authors also have identified relations between these dimensions and the Big-Five model dimensions (see Table 1).

Table 1 – *Zimbardo & Boyd (1999) correlations between the ZTPI dimensions and the Big-Five*

	Positive Correlation	**Negative Correlation**
Negative Past	Neuroticism	Agreeableness, Conscientiousness and Extraversion
Positive Past	Agreeableness and Extraversion	
Hedonist Present	Extraversion and Neuroticism	Conscientiousness
Fatalist Present	Neuroticism	Openness, Conscientiousness and Extraversion
Future	Conscientiousness, Extraversion and Openness	

More recently, Dunkel & Weber (2010) have performed a correlational study between the ZTPI and the Big-Five dimensions (Table 2).

Table 2 – *Dunkel & Weber (2010) correlations between the ZTPI dimensions with the Big-Five*

	Positive Correlation	**Negative Correlation**
Negative Past	Neuroticism	Openness, Agreeableness and Extraversion
Positive Past	Agreeableness and Extraversion	Neuroticism
Hedonist Present	Openness, Extraversion and Agreeableness	Conscientiousness and Neuroticism
Fatalist Present		Conscientiousness
Future	Conscientiousness, Agreeableness and Neuroticism	

Once again, and in comparison with the previous table, some correlations are repeated in the Zimbardo & Boyd (1999) and Dunkel & Weber (2010) studies. Only looking at the more significant correlations ($p<001$) that are repeated in both studies, we observe that Negative Past relates to Neuroticism, Possitive Past relates to Agreeableness, Hedonist

Present relates to Extroversion, Fatalist Present negatively relates to Consciousness and Future relates to Consciousness, being the Openness the only dimension of Big-Five that doesn't seem to stabilize crossing these two studies.

However, it's important to refer that this data relates to American samples which turns relevant to explore the relations of TP with the Big-Five on Portuguese population.

Despite the current study has an exploratory objective, it's not expected that the found relations between TP and Big-Five in the Portuguese population, will be much different of the ones that were found in the data crossing by Zimbardo and Boyd (1999) and Dunkel and Weber (2010).

Method

Sample

This study has counted with 326 participants (60% male) with an age average of 29,3 years and a standard-deviation of 8,96, being the youngest participant 16 years old and the oldest 63 years old.

Instruments

The following instruments were used in order to study the relation between TP and the Big-Five model:

ZTPI (Zimbardo & Boyd, 1999), portuguese version translated by Ortuño & Gamboa (2008). The 56 items inventory allows to measure the fin dimensions of time perspective 5 dimensions (Negative past, Positive past, Hedonist present, Fatalist present and Future).

BFI-10 (Rammstedt & John, 2007), an adapted version to Portuguese population by Bártolo-Ribeiro and Aguiar (2008), is a short version of 10 items of BFI-44. It measures 5 Big-Five dimensions (Openness, Agreeableness, Conscientiousness, Extraversion, and Neuroticism) in one minute or less.

Procedure

The data collection was performed in two application contexts: one in a face-to face way, using paper and pen (19,3% of the sample) and other in an online way, using "Kwik Surveys", a platform that allows to apply questionnaires for site disclosure.

Results

To explore the relations of TP model and the Big-Five model, we performed a correlation analysis between ZTPI and the BFI-10 dimensions (Table 3).

Table 3 – *Correlations between the ZTPI and the Big-Five Dimensions*

	BFI-10 dimensions				
ZTPI dimensions	Openness	Agreeableness	Conscientiousness	Extraversion	Neuroticism
Negative Past	-.03	-.19***	-.25***	-.07	.37***
Positive Past	-.02	.28***	-.01	.20***	-.1
Hedonist Present	.22***	.16**	-.16**	.28***	.08
Fatalist Present	-.13	-.07	-.24***	-.01	.15**
Future	.12*	.17**	.44***	.09	.06

N=326. *p<0,05; ** <0,01; ***p<0,001

Like it is suggested in Table 3, different TP's dimensions relate to different Big-Five traits. Reporting most significant correlations, Negative Past is positively correlated with Neuroticism, but negatively with Conscientiousness and Agreeableness. Positive Past is associated with Agreeableness and Extraversion. Hedonist Present is correlated with Extraversion and Openness. Fatalist Present has a negative correlation with Conscientiousness. Finally, is verified a strong and direct correlation between Future and Conscientiousness, contrary to negative relation with Negative Past.

Discussion and some considerations

This study demonstrates that the relations between the TP and the Big-Five dimensions in a portuguese sample, at least the more significant (p<.001), don't differ significantly from the studies with American samples (Zimbardo & Boyd, 1999; Dunkel & Weber, 2010), except the relation between Negative Past and Extroversion that may suggest the existence of cultural differences in the way that people deal or compensate their negative past experiences.

Our research also sustains the use of reduced scales (e.g. BFI-10), enhancing the idea of Robins, Tracy, Trzesniewski, Potter & Gosling (2001), that these short versions are faster but, also, reliable measuring instruments when applied in research contexts. However, in future studies it would still be relevant to use more complete personality scales to access not only the 5 dimensions of superior order, but also its sub dimensions in order to draw a more complete personality profile.

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Chapter 10

Satisfaction with Life and College Social Integration: A Time Perspective Multiple Regression Model

Victor E. C. Ortuño
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal
victortuno@gmail.com

Catarina V. M. Gomes
Independent Practice, Porto, Portugal

Alejandro Vásquez
Faculty of Psychology and Educational Sciences, University of Porto, Portugal
Faculty of Psychology, University of the Republic, Uruguay

Pedro Belo
Institute for Cognitive Psychology, Vocational & Social Development,
University of Coimbra, Portugal

Susana Imaginário
Faculty of Human & Social Sciences, University of Algarve, Portugal

Maria Paula Paixão
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal

Isabel Nunes Janeiro
Faculty of Psychology, University of Lisbon, Portugal

Abstract: Time Perspective – TP has a determinant influence on human behavior and cognitions. Hence, it's also a powerful predictor of several functional and dysfunctional behaviors (Zimbardo & Boyd, 1999). Still, depending on the nature of the studied construct, different facets of TP should be considered. The objective of this study is to clarify the predictor power of TP in 4 constructs related to well-being. The sample is composed of 143 Portuguese College students, with ages between 17 and 54 years old. Through a series of Multiple Regression Analyses (Stepwise Method) TP appears as a moderate and significant predictor of: Satisfaction with Life (Adj. R^2 = .165, p < .001); Interpersonal Relations (Adj. R^2 = .067, p < .01); Psychological Well-Being (Adj. R^2 = .207, p < .001) and Emotional Balance (Adj. R^2 = .115, p < .001). These results highlight the role that TP has in the prediction of an adaptive psychological functioning.

Keywords: time perspective, motivation, well-being, ZTPI, multiple regression.

Introduction

The study of subjective temporality has raised strong debates during the last 50 years. Several instruments and theoretical viewpoints were developed to gain better understanding about it. One of the most influential authors is probably Kurt Lewin, who defines subjective temporality or Time Perspective (TP) as "the totality of the individual's view of his psychological future and psychological past existing at a given time" (1951, p. 75). Thus, Lewin puts the emphasis on the study of present time, but without neglecting the influence that the various mental constructs of the individuals about the past and the future may have on affect, behavior and cognition. Therefore, all human activity takes place embedded in a context, which is composed by geo-socio-political features, but also by the temporal dimension which gives order to the same activities and processes, through its location along the temporal *continuum* (Lewin, 1951).

At present, one of the most widely used theoretical references for the research of time is the one proposed by Zimbardo and Boyd (1999). Continuing the thought of Lewin, these authors argue that Time Perspective is an unconscious process that assists individuals in encoding, storing and retrieving information related to personal and social objects that fill their life; this process makes it possible to bring order, meaning and coherence to these same objects through various time categories, which also allow a reinterpretation of all this information.

It was suggested that TP, as it is defined in terms of Lewin and operationalized by Zimbardo, is related to well-being. The Past-Negative sub-scale has been associated with depression, anxiety and lower scores of self-esteem. On the contrary, people that score high in Past Positive show more self-esteem, happiness and enjoy more social support. Individuals with higher present orientation are more prone to engage in health-related risk behaviors, and less in preventive behaviors (Boyd & Zimbardo, 2005). In addition, subjects with a balanced time perspective were found to have more subjective well-being and more mindfulness (Drake et al., 2008).

The objective of this study is to identify the predictor power of TP in 4 constructs related to well-being and social integration into university among a sample of undergraduate students.

Method

Participants

The sample was composed of 143 participants with ages between 17 and 54 years old (M = 19.63, S.D. = 4.78). 125 (89.3%) were females and 15 (10.7%) males. Participants were recruited from the Faculties of Psychology and Educational Sciences of the University of Coimbra (n = 120) and the University of Porto (n = 23). 96 (67.6%) attend the Integrated Master in Psychology, 44 (31%) the Master in Educational Sciences and 2 (1.4%) the Anthropology Undergraduate Degree. 138 (97.2%) students were first year undergraduates.

Instruments

All the data was collected using 6 instruments: a Socio-Demographic Questionnaire, the Portuguese adaptation of the Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999; Ortuño & Gamboa, 2009), the Negative Future Scale from Inventário de Perspectiva Temporal – IPT (Janeiro, 2006), the Portuguese Transcendental-Future Time Perspective Scale – TFTPS (Boyd & Zimbardo, 1997; Ortuño, Paixão & Janeiro, 2013), the Satisfaction with Life Scale – SWLS (Diener, Emmons, Larsen & Griffin, 1985; Neto, 2003) and the Scale of Social Integration in Higher Education – EISES (Diniz & Almeida, 2005).

Socio-Demographic Questionnaire: Drawn up by the authors in order to characterize the sample (age, sex, course, course year, etc.).

Zimbardo Time Perspective In*ventory – ZTPI* (Zimbardo & Boyd, 1999; Ortuño & Gamboa, 2009): it is composed of 56 items (5-point Likert scale) which represents 5 temporal dimensions: 1) Past Positive, related to pleasant and warm attitudes towards the past (explained variance = 6.02%, α = .68, 9 items), 2) Past Negative, represents an aversive and distressful attitude towards the past (variance explained = 7.85%, α = .80, 10 items), 3) Present Hedonist, represents a tendency to seek immediate pleasure, through exciting and risky experiences (explained variance = 8.37%, α = .79, 15 items), 4) Present Fatalist, shows a totally defeatist attitude towards life (explained variance = 6.42%, α = .66, 9 items) and 5) Future, indicates a strong tendency to create and pursue long term objectives (variance explained = 6.57%, α = .74, 13 items). These 5 temporal dimensions explain 35.25% of the total variance. This factor structure is very similar to that presented by Zimbardo and Boyd (1999) in the original ZTPI, and also in several international adaptations (Ortuño, Paixão & Janeiro, 2011). Concerning the test/re-test validity, the Portuguese ZTPI shows values between .66 and .86 (Ortuño & Gamboa, 2008).

Inventário de Perspectiva Temporal – IPT (Janeiro, 2012): it is formed by 32 items (7-point Likert-type scale), grouped in 4 temporal dimensions: 1) Past Orientation, 2) Present Orientation, 3) Future Orientation and 4) Negative Future. In this study we used only four items related to the negative future dimension (variance explained = 8%, α = .70, 4 items) which is related to an unpredictable and threatening vision of events yet to come.

Transcendental-Future Time Perspective Scale – TFTPS (Boyd & Zimbardo, 1997; Ortuño, Paixão & Janeiro, 2013): This is a one-dimension scale, formed by 10 items (5-point Likert scale). It evaluates the individual's beliefs and attitudes about the future after the death of the physical body. The original TFTPS explains 10% of the total variance, with a internal consistency of .87 and a test/re-test stability of .86.

Satisfaction with Life Scale – SWLS (Diener et al., 1985; Neto, 2003): composed by 5 items (7-point Likert scale) in one dimension. It has an internal consistency of .78 and explains 53.3% of the variance. This scale evaluates the individual's life satisfaction as a cognitive-judgmental process.

Scale of Social Integration in Higher Education – EISES (Diniz & Almeida, 2005): This scale was specially developed for Portuguese students and is composed of 14 items, evaluated in a 5-point Likert scale, divided into three dimensions: interpersonal relationship (Cronbach's alpha = .68), personal well-being (.64) and emotional balance (.82).

Procedures & Statistical Analyses

All the data was collected in classrooms. The responses were standardized and any Z value higher than 2.5 or lower than -2.5 was considered an outlier. Several Multiple Regression Models were performed (Stepwise method) using 7 dimensions of TP as predictor variables of each model and 4 variables related with psychological well-being and social integration as criterion variables.

All the collected data was introduced into the statistical program Statistical Package for the Social Sciences – SPPS 16.0 (Windows version).

Results

Four significant models were found for the 4 criterion variables (Table 1). Regarding Satisfaction with Life, the model composed of the Past Negative and Future Negative dimensions, predicts 17% ($p < .001$) of the results. As observed through the Beta Standardized Coefficient (β), both temporal dimensions present a negative relation to the criterion variable.

Table 1 – *SWLS & EISES – Time Perspective Multiple Regression Models*

	$R^2_{adj.}$	ΔR^2	*DF*	*F*	*p* (Model)	β	*t*	*p*	Tolerance	VIF	Cond. Index
Satisfaction with Life (SWLS)	.165		2,114	12.445	.000						
Past Negative		.144				-.308	-3.391	.001	.875	1.14	1.19
Future Negative		.036				-.202	-2.223	.028	.875	1.14	1.47
Interpersonal Relations (EISES)	.067		1,114	9.198	.003						
Past Negative		.075				-.273	-3.033	.003			
Psychological Well-Being (EISES)	.207		3,113	11.072	.000						
Past Negative		.136				-.228	-2.498	.014	.817	1.22	1.33
Present Fatalist		.062				-.201	-2.169	.032	.795	1.26	1.63
Future Negative		.029				-.194	-2.051	.043	.761	1.31	1.75
Emotional Balance (EISES)	.115		1,116	16.219	.000						
Future Negative		.123				-.350	-4.027	.000			

Past Negative is the only temporal variable in the Interpersonal Relations model and predicts 7% of the results ($p < .01$). In this case, the predicting variable is also negatively related to the criterion variable.

The predictive model for Psychological Well-being is constituted by 3 temporal dimensions: Past Negative, Present Fatalist and Future Negative. All these three predictor variables are negatively related to the criterion variable. The model predicts 21% of the results ($p < .001$).

Regarding Emotional Balance, the model is composed by Future Negative, which presents a negative relation to Emotional Balance, and predicts 12% of the results ($p < .001$).

No multicolinearity problems were found, since in all cases the Condition Index is below 15 and the Variance Inflation Factor (VIF) is below 10. In the Interpersonal Relations and Emotional Balance models these values are not shown since they are Simple Regression Models.

Discussion

A few core ideas emerged from the results of this study: (a) the individual's temporal profile must be analyzed according to the nature of the psychological phenomenon we try to understand; (b) different phenomena have different relations to each of the temporal dimensions; (c) the multidimensional nature of the TP is manifest; (d) specifically regarding this study, the "negative" dimensions of TP are the ones with most predictive power; being also negatively related with those constructs and (e) TP predictive capabilities are more accurate in determinate constructs than others (e.g., good regarding Satisfaction with Life and Psychological Well-Being, acceptable about Emotional Balance and poor concerning Interpersonal Relations).

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Chapter 11

Connection between self-attitude components and personal time perspective profiles

Maria Mandrykina
Olga Molchanova
National Research University Higher School of Economics, Russia
mandrykina@gmail.com
olmol@list.ru

Abstract: This research investigates the interrelation between subjective well-being components and time perspective. Self-attitude is taken into consideration as a central aspect of well-being. According to the aims of the study, participants completed the Ryff Subjective Well-being Scales, The Lyubomirsky Subjective Happiness Scale, the Satisfaction with Life Scale, the Zimbardo Time Perspective Inventory and the Stolin Self-attitude Inventory. The sample included 93 university students, both men (43) and women (50) aged from 17 to 26 years old. Based on the correlational analysis, the association between subjective well-being aspects and time perspective is found: future-oriented people, who view their past in a positive way, have a higher level of self-respect, self-acceptance, self-understanding and self-guidance. Five time perspective profiles are discovered by cluster analysis: past negative-oriented (17,2%), future-oriented (24,7%), risk (18,3%), balanced (23,7%) and moderately present-oriented (16,1%). Subjective well-being and self-attitude scores are higher among participants, who achieved balanced time perspective and, therefore, have an authentic self-esteem. It's important to mention that self-attitude scores are higher among the future-oriented sample. This fact can be explained the following way: this orientation serves a protective function, being based not on the real evidence, but just on hopes and expectations, taking into account the age of respondents.

Keywords: subjective well-being, self-attitude, ZTPI, time perspective profiles.

Introduction

Relation between subjective well-being and personal time

At the moment attaining subjective well-being state is viewed as a fundamental need for individuals in modern society. It's common knowledge that time doesn't exist independently of a person, so the considerable importance of time in conceptions of well-being is to be mentioned in these terms (Abulkhanova-Slavskaya, 2001; Argyle, 2003; Corrywright, 2009; Diener, Suh & Oishi,1997; Drake, 2008; Headey & Weaning, 1992; Nuttin, 1985; Yaksina, 2009; 2011). Despite the abundance of research which studies the interrelation between subjective well-being components and time perspective, it is still under question which time perspective contributes more significantly to higher subjective well-being scores (Boniwell & Zimbardo, 2004; Boniwell, 2005; Boniwell, Osin, Linley & Ivanchenko, 2010). As it involves significance of time factors in the context of subjective

well-being studies, it is the reason for high scholarly interest in this issue. Thus, the primary aim of the study is to examine the peculiarities of interrelation between the structural components of subjective well-being and time perspective. In this framework taking self-attitude into consideration as a central component of subjective well-being determines the novelty of this research.

Subjective well-being is a notion worked out in the field of positive psychology that attempts to understand people's evaluations of their lives. There are two general approaches to it, emphasizing different aspects of this construct: hedonic, which is primarily related to pleasure, self-satisfaction and happiness and eudaimonic, which recognizes the realization of human potential as central to well-being (Lennings, 2000; Perova & Entkolopon, 2009; Seligman, 2006; Sozontov, 2006). This study focuses on the model proposed by C. Ryff, which combines the ideas of both approaches. According to the above-mentioned model, several key components, e.g., purpose in life, autonomy, positive relations, self-acceptance, environmental mastery and personal growth, have been distinguished to serve the research aims (Ryff & Singen, 2006).

Thus, for the aims of the study, subjective well-being can be defined as a state of experiencing psychological comfort by an individual, who leads a meaningful life, uses diverse strategies for self-development, establishes goals, accepts himself, has positive feelings and is satisfied with environment, personal relationship and situation on the whole.

Recent empirical research has shown that particular temporal characteristics have implications for various aspects of well-being. The latest tendency in recently conducted studies shows high interest in further operationalization of the balanced time perspective construct, which is the time perspective where 'the past, present and future components blend and flexibly engage, depending on a situation's demands and our needs and values' (Boniwell & Zimbardo, 2004). Time integrity awareness is a crucial attribute of well-being as it characterizes an individual knowledge of one's own identity, due to recognition of oneself in the past, the present and the future at a given time (Bochaver, 2008; Bolotova, 2006, 2007; Mandrikova, 2008; Nourkova, 2003).

Study

The present study chooses to focus on how Zimbardo defines and operationalizes time perspective. According to him TP is 'the manner in which individuals and cultures partition the flow of human experience into distinct temporal categories of past, present and future' (Boniwell & Zimbardo, 2004) measured with the ZTPI, comprising five subscales: Past Negative (PN), Present Hedonistic (PH), Future (F), Past Positive (PP) and Present Fatalistic (PF) (Sircova & Mitina, 2008).

The study investigates interrelations between the structural aspects of well-being and time perspective and is expected to prove the existing operationalization of the balanced time perspective construct as well. Therefore, the following hypotheses are implied:

1) There is correlation between subjective well-being components and time perspective profiles:
   - subjective well-being components have a positive relationship with past positive and future time perspective;
   - subjective well-being components have a negative relationship with past negative, present hedonistic and present fatalistic time perspective;

2) Five types of time perspective can be organized in a different structure and, therefore, time profiles can be discovered;
3) Subjective well-being scores relate to the time profile:
   • subjective well-being scores and self-attitude scores are higher among participants who achieved the balanced time perspective state.

Method

To achieve the goals of the study a correlational questionnaire-based design as well as factor and cluster analyses were applied. The sample included 93 university students, both male (43) and female (50), aged from 17 to 26. Confidentiality was guaranteed, and no remuneration was offered.

The questionnaire included the following inventories:

1) the *Ryff Subjective Well-being Scales* (adapt. Shevelenkova & Fesenko, 2005),
2) the *Lyubomirsky Subjective Happiness Scale* (adapt. D.A. Leontiev),
3) the *Satisfaction with Life Scale* (adapt. D.A. Leontiev),
4) the *Zimbardo Time Perspective Inventory* (adapt. Sircova & Mitina, 2008),
5) the *Stolin Self-attitude Inventory*.

Results and discussion

Based on the correlational analysis, the association between subjective well-being aspects and time perspective is found: future-oriented people, who view their past in a positive way, have a higher level of self-respect, self-acceptance, self-understanding and self-guidance (see Table 1, Table 2).

Table 1 – *Spearmen correlation between the ZTPI scales and subjective well-being components (Russian sample, N=93)*

	NP	PH	F	PP	PF
Positive relations	-.23*		.32**	.36**	-.28**
Autonomy					
Environmental mastery	-.37**		.48**		-.47**
Personal growth		.30**	.27**		-.37**
Purpose in life	-.32**		.61**	.33**	-.43**
Self-acceptance	-.56**		.27**	.29**	-.41**
Life satisfaction (cognitive aspect)	-.34**		.31**	.22**	-.21**
Subjective happiness (emotional aspect)	-.27**				
Subjective well-being (general score)	-.40**		.45**	.29**	-.48**

Note. *p<0.05; **p<0.01.

Table 2 – *Spearmen correlation between the ZTPI scales and self-attitude components (Russian sample, N=93)*

	NP	PH	F	PP	PF
Self-attitude	-.44**		.36**		-.29**
Self-respect	-.57**		.32**		-.41**
Positive attitude expectancy	-.26*		.40**		-.32**
Self-confidence	-.39**		.32**		
Relation with others	-.24*		.39**	.28**	-.31**
Self-acceptance	-.39**				-.32**
Self-guidance	-.40**	-.22*			-.25*
Self-interest	-.27*		.27**	.28**	-.23*
Self-understanding	-.43**				

Note. *p<0.05; **p<0.01.

Therefore, the 1st hypothesis is partly proved, except for the Present Hedonic time perspective, which is, on the contrary, positively linked to personal growth (see Table 1).

As for the 2nd hypothesis, five time perspective profiles are discovered by hierarchical cluster analysis using Wards method and Squared Euclidean metric (see Table 3):

- past negative-oriented (17,2%), which is characterized by low PP, PH, moderate F, PF and high PN level;
- future-oriented (24,7%), which is characterized by high F, low PN, PP, PF and moderate PH level;
- risk (18,3%), which is characterized by especially high PH, high PF, PN and moderate PP and F level;
- balanced (23,7%), which is characterized by high PP, F, moderate PH and low PF and PN level;
- and moderately present-oriented (16,1%), which is characterized by low PP, PN, F and moderate PF and PH level.

They are the same types that were discovered by Zimbardo and colleagues (Boniwell, 2010; Zimbardo & Boyd, 2010), except for the last profile.

Table 3 – *Cluster means and time perspective profiles*

Cluster number (number of respondents)	1 (16)	2 (23)	3 (22)	4 (17)	5 (15)
Past Negative	2.92	2.19	2.3	3.2	2.29
Present Hedonic	2.69	3.41	3.31	4.07	3.44
Future	3.64	3.68	3.96	3.4	2.5
Past Positive	3.33	3.42	4.39	3.77	3.32
Present Fatalistic	2.76	2.21	2.31	3.7	2.86

Note. 1 – past negative-oriented (17,2%), 2 – future-oriented (24,7%), 3 – balanced (23,7%), 4 – risk (18,3%), 5 – moderately present-oriented (16,1%).

We also should mention that past positive scores are higher among the Russian sample compared to established norms (Sircova & Mitina, 2008). Given this fact, we suppose that attaining high scores in this subscale has its roots in cultural background (see Table 3).

As far as the 3rd hypothesis is concerned, subjective well-being and self-attitude scores are higher among participants who achieved balanced time perspective and, therefore, have an authentic self-esteem (see Table 4, Table 5). In contrast to previously obtained results, which indicate balanced time perspective as a basis for high subjective well-being (Boniwell, 2010; Drake et al., 2008; Zimbardo, 2010), this study showed that subjective well-being scores are high among the future-oriented sample as well. To sum up, 48.4% of the sample, almost half, have high scores of subjective well-being. It's important to mention that self-attitude scores are even higher among the future-oriented sample, not balanced time perspective sample. This fact can be explained the following way: the future orientation serves a protective function, being based not on the real evidence, but just on hopes and expectations, taking into account the age of respondents.

Table 4 – *Subjective well-being scores of time perspective profiles*

	1	2	3	4	5
Subjective well-being (general score)	340	378	380	346	341
Positive relations	58.6	64	68.7	61.76	59.6
Environmental mastery	55.5	62.04	60.18	51.05	48.4
Personal growth	61.3	69.5	69	66.11	64.5
Purpose in life	55.56	62.26	63.36	55.1	49.9
Self-acceptance	53	63.08	64.18	52.88	57.73
Life satisfaction	19.12	23.65	25.22	21.29	21.73
Autonomy**	56.37	57.34	55.36	59.88	61.4
Subjective happiness**	16.9	18.04	18.5	17.5	17.5

(** differences are statistically insignificant)
Note. 1 – past negative-oriented, 2 – future-oriented, 3 – balanced, 4 – risk, 5 – moderately present-oriented.

Table 5 – *Self-attitude scores of time perspective profiles*

	1	2	3	4	5
Self-attitude	16.875	20.78	19.5	17.17	18.6
Self-respect	8.81	11.17	10.32	8.11	9.46
Positive attitude expectancy	9.5	10.96	10.64	9.53	9.2
Self-interest	5.43	7.08	6.81	6.17	6.26
Self-confidence**	5.12	6.43	6.09	5.5	5.13
Self-acceptance	4.18	6.04	5.45	4.41	5.33
Self-guidance	4.25	4.56	4.68	3.4	4.06
Self-understanding**	3	3.6	3.64	3	3.93

(** differences are statistically insignificant)
Note. 1 – past negative-oriented, 2 – future-oriented, 3 – balanced, 4 – risk, 5 – moderately present-oriented.

People with past negative-orientation are individuals, who have low subjective well-being and self-attitude scores, and a moderately high level of environmental mastery, which relates to expectation of others' positive attitude, which means that people with this time profile are likely to expect other people to feel sympathetic for their negative experience and create an environment due to their expectations.

Risk-profile individuals present high past negative scores and moderate personal growth. The underlying psychological mechanism is compensation. They transform past negative experience by self-realization in the present. Moderate self-interest and expectation of positive relationship indicate the importance of others admitting value of risk-profile individuals. It helps them to increase their low level of self-respect and to confirm their being.

People who are moderately present-oriented have moderate self-attitude level, low past negative scores and present a time perspective pattern which is much better in comparison with past negative-and risk-profile. Personal growth and self-acceptance are significant aspects of their life. Due to self-guidance, these people rely on themselves, while they are achieving their goals. Self-acceptance gives them inner confidence, with which they are able to solve their problems on their own.

Conclusions

Finally, looking at the obtained results, self-attitude appears to be one of the most significant subjective well-being components. Being the self-consciousness component, as a process which is developed throughout the life, interrelation between self-attitude components and time perspective profiles is established. It appears to be of high interest in terms of examining relations between self-attitude and balanced time perspective as one of the most investigated and operationalizated concepts in mainstream psychology.

The proposed research has both theoretical and practical significance as it extends existing knowledge and indicates the possibility of creating self-attitude typology for time perspective profiles which can be regarded as a crucial psychological resource in terms of individual psychotherapeutic practice.

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Chapter 12

Positive and negative affect in daily and weekly variations from the physiological and social perspective

Agnieszka Wilczynska
Institute of Psychology, University of Silesia, Poland
agnieszka.wilezynska@us.edu.pl

Abstract: Regularity of emotional functioning of a human in specific time can be determined by cycles characterised by psychophysiological and social changes. The objective of the research was to establish whether the population subjected to the research-related tests experienced circadian and circaseptan mood variability and, if this relation has been confirmed, describe the latter. Mood was tested by means of Positive and Negative Affect Scale (Watson, Clark & Tellegen, 1988). Subjects judged their mood by means of two indicators (positive and negative affect), for one week, on a daily basis, at 3-hour intervals. Circadian and circaseptan variability was assessed by comparing averaged results obtained from all measurements carried out at specific times of the day and days of the week. The assessment of internal group differences was performed with the repeated measures analysis of variance. The result obtained in the tests indicated the existence of circadian differences of positive affect as well as circaseptan differences in relation to positive and negative affect.

Keywords: negative affect, positive affect, circadian, circaseptan.

Introduction

Regularity of an individual's psychosocial functioning is determined by cycles being characterised by social and psycho-physiological changes of different origin and diverse frequency. Due to recurrence one can distinguish the following cycles: circadian, circaseptan, monthly and annual (Clark, Watson & Leeka, 1989; Cornelissen et al., 2005; Mitsutake et al., 2001; Murray, Allen & Thinder, 2002).

The relation of changes in the intensification of positive and negative affect as well as cognitive efficacy in circadian and circaseptan rhythms have been studied before. It was already in the 30s of the 20th century that Otto Graf presented as a result of his research 'a physiological labour curve' ('physiologische Leistungskurve') showing changes in a man's efficiency at certain times of the day. The research conducted by Bo Bjerner and collaborators (1955) showed that a psychological and physical efficiency of most people reaches the lowest point at 12-hour intervals, i.e. around 3 a.m. and 3 p.m.

A discipline of science dealing with the analysis and description of repetitive life phenomena as well as identification of biological rhythms has been named chronobiology, whereas the science using such knowledge to boost health and life quality has been called chronomics (Halberg et al., 2009). Psychological aspects of the rhythms are dealt with by chronopsychology (Sędek & Bedyńska, 2010).

Affectivity is one of the most essential aspects of human functioning, yet the least explored. The researchers find it difficult to define affect (Murphy & Zajonc, 1993),

however, they are agreed on the issue that affectivity may be considered as a positive and negative type of arousal within two orthogonal dimensions having their own physiological correlates (Watson et al., 1988).

The course of most psycho-physiological rhythms has been encoded in the human cells and is controlled by nervous structures, which are popularly called a 'biological clock'. These structures are suprachiasmaticus nucleei located symmetrically in the anterior part of the hypothalamus. The biological clock manages the rhythms regulating, among other things, the increase of the sympathetic nervous system tension during the day and its decrease at night. It also regulates secretion of hormones, such as: cortisol, melatonin, serotonin, testosterone at certain times of the day. It regulates in this way the body temperature as well as changes of mood and cognitive efficacy, in an individual way in each human being (Furlan et al., 1990; Halberg et al., 2000, 2009). Individual differences in the course of circadian rhythms have been reflected also in the description of a chronotype which orients an individual to have a more effective evening affectivity ('owls') or morning affectivity ('larks') (Horne & Ostberg, 1976; Matthews, 1988).

Among a lot of research emphasising the importance of circadian rhythms for an individual's functioning there are also analyses of mood changes dependent on the time of the day (Clark et al, 1989; Cornelissen, et al., 2005).

Various factors contribute to the adaptation of an individual to their life environment. These factors influence the biological clock and are called synchronisers or time markers. Circaseptan rhythms are synchronised mainly by social and cultural factors, among which the most important is the organisation of the social life, working hours of schools and institutions, opening hours of shops, etc. (Terelak, 2008). For the social synchronisers to be considered the source of the exogenous rhythms in the human body – they need to be characterised by their own, relatively stable, rhythm and occur regularly with a certain frequency. The circaseptan rhythm is the only rhythm reflecting almost exclusively the influence of social synchronisers. Circaseptan rhythms similarly to circadian rhythms, may be registered by means of recording psycho-physiological functions of the body, such as fluctuation of heart parametres, temperature and hormones (Halberg, et al., 2000).

Temporal aspect of human functioning has been highlighted by Lawrence A. Pervin's definition (2002). According to this scientist, personality consists of structures and processes which reflect not only a mutual operation of genes and environment but also encompass a temporal aspect of human functioning, including 'the memories of the past, mental representations of the presence as well as conceptions and expectations concerning the future' (Pervin, 2002).

The research of the changeability of positive and negative affect in a circaseptan rhythm conducted by Germaine Cornelissen and collaborators (2005) showed the regularity of affective cycles both within 24 hours (day and night) and within a week.

A high intensity of positive affect is connected with smaller secretion of stress hormones (such as adrenaline, noradrenaline and cortisol). The researchers explain that this effect concerns people who are characterised by psychological flexibility and more often use their positive resources when confronted with stress-generating situations.

The objective of the research was to establish whether the population subjected to the research-related tests experienced circadian and circaseptan mood variability and, if this relation has been confirmed, describe the latter.

Positive and Negative Affectivity

Nico H. Frijda (1986) shares this cognitive approach by defining affect as a basic pleasant or unpleasant feeling aroused by cognitive interpretation and attribution of significance to a stimulus situation. Evaluation of the situation is made by an individual on the basis of the criteria, such as: pleasantness, predicted easiness or difficulty of achieving a goal, possibility of controlling the situation, human agency, certainty of the outcome or predictability of the consequences. Frijda's concept emphasizes the functional aspect of emotions and their adaptive functions. The level of adaptation and the vision of the future constitute a frame of reference for generated emotions.

Watson and collaborators (1999) use the term of dispositional affect in order to differentiate the notion of affect from the notion of mood. The researchers describe affect as a relatively permanent disposition of personality regulating our reactions. Positive affect (PA) is distinguished irrespective of negative affect (NA). The type of occurring emotion or mood may depend on the preceding affect (Frijda, 1986; Lazarus, 1991). Many papers emphasize the influence that affect has on cognitive and motivational processes in human behaviour.

Method

The differences between positive and negative affect were tested by means of PANAS (Positive Affect Negative Affect Scale) developed by David Watson, Lee Anna Clark & Auke Tellegen (1988). The scale can be applied in various aspects of subjectively perceived time. By means of this tool the subjects may specify how they feel at the moment, how they felt in a specific situation or how they tend to feel (Crawford & Henry, 2004).

The scale makes it possible to test positive and negative affect in the context of a specific situation or to test the affectivity as a personality characteristic (Crawford & Henry, 2004). The subscales (PA and NA) are negatively correlated with each other on the level r~ -.30 and individual test items within their scale are positively correlated with each other on the levels r~ .70/.80, which confirms the accuracy of the scale (PANAS). The negative correlation between PA and NA scales may indicate that these affects are relatively independent from each other. In addition, this tool is characterised by good psychometric properties. The reliability of PA and NA of the PANAS test assessed using Crobach α amounts to .89 (95% CI = .88-.90) for the PA scale and .85 (95% CI = .84-.87) for the NA scale respectively. The scale contains 20 various affect-related states (20 test items). 10 of the test items are indications used to measure positive affect (PA scale), whereas the remaining items are used to measure negative affect (NA scale). Low, average and high results are determined on the standardisation basis. The minimum raw result in a given scale is 10 points, whereas the maximum raw result amounts to 50 points. On the basis of the standard tests carried by John R. Crawford and Julie D. Henry (2004), separate standards for PA and NA scales were developed; in doing so the percentile scale was applied. Filling out a questionnaire takes only a few minutes.

Participants and way of data analysis

The tests engaged 117 participants. The subjects assessed their mood by means of the two aforementioned indicators (NA and PA) 6 times a day, seven days a week i.e. The first

measurement took place directly after waking up, with successive measurements timed every 3 hours i.e. 3h, 6h, 9h, 12h and 15 hours after waking up. The tests were three months in duration.

Circadian variability was assessed by comparing averaged results obtained on each day of the week, at specified times of the day. Circaseptan variability was assessed by comparing averaged results obtained from all measurements carried out on a given day. As averaged measurements on successive days and averaged measurements at specified times of the day collected from one group are obviously interdependent (correlated), the intergroup differences were subjected to repeated-measures analysis of variances. Two backgrounds were developed for each affect sign. In the first background, the factor of analysis was a day of the week; the factor having 7 levels. In the second background, the factor of analysis was a time of the day; this factor had 6 levels.

Results

Circaseptan variability of positive affect

Below presented are the results of repeated-measures analysis of variances for the variable of positive affect. The results are illustrated in Figure 1.

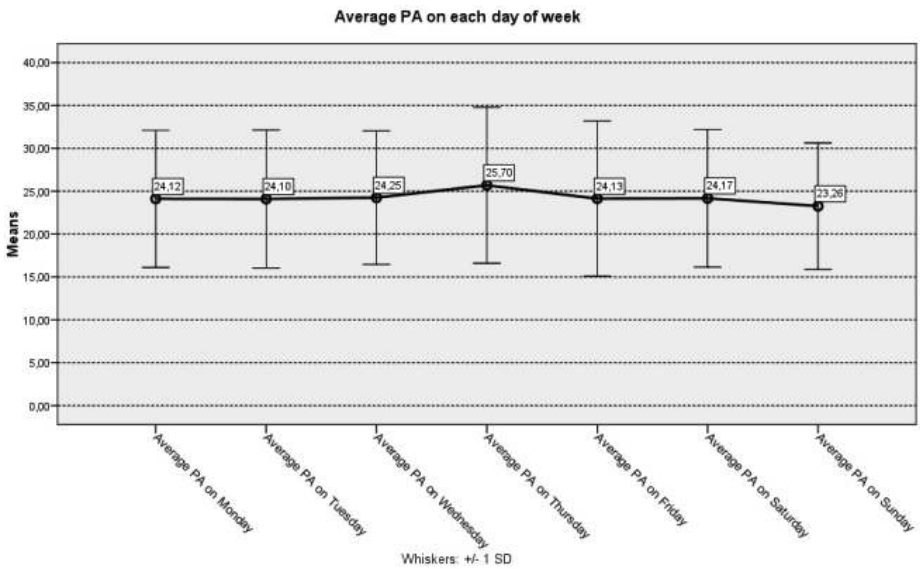

Figure 1. Level of positive affect averaged on successive days of the week.

Table 1 presents the results of the tests of intra-object effects, revealing that various days are statistically significantly differrent to one another with reference to positive affect intensity of the same test participants. One should note, however, that the value of Eta^2 is very low, which means that the dependence is rather weak.

Table 1 – *Results of tests of intra-object effects of positive affect – day of the week*

Source		Sum of squares	df	Average square	F	Sig.	Partial Eta^2
Day	Assumed sphericity	362.025	6	60.337	3.547	.002	.030
	Greenhouse-Geisser	**362.025**	**4.484**	**80.731**	**3.547**	**.005**	**.030**
	Huynh-Feldt	362.025	4.689	77.211	3.547	.005	.030
	Lower-bound	362.025	1.000	362.025	3.547	.062	.030
Error	Assumed sphericity	11738.817	690	17.013			
	Greenhouse-Geisser	11738.817	515.701	22.763			
	Huynh-Feldt	11738.817	539.212	21.770			
	Lower-bound	11738.817	115.000	102.077			

Table 2 – *Comparisons of pairs of successive days of the week in relation to positive affect*

(I) day	(J) day	Average difference (I-J)	Standard difference error	**Sig.**	95% range of difference confidence	
					Lower limit	Upper limit
Monday	Tuesday	.022	.430	**.960**	-.831	.874
	Wednesday	-.129	.473	**.785**	-1.066	.808
	Thursday	-1.576*	.573	**.007**	-2.712	-.441
	Friday	-.014	.594	**.981**	-1.192	1.163
	Saturday	-.050	.477	**.916**	-.994	.894
	Sunday	.855*	.391	**.031**	.080	1.629
Tuesday	Wednesday	-.151	.428	**.725**	-.999	.697
	Thursday	-1.598*	.530	**.003**	-2.647	-.548
	Friday	-.036	.678	**.958**	-1.378	1.306
	Saturday	-.072	.524	**.891**	-1.111	.967
	Sunday	.833	.503	**.100**	-.163	1.829
Wednesday	Thursday	-1.447*	.493	**.004**	-2.423	-.470
	Friday	.115	.629	**.855**	-1.131	1.360
	Saturday	.079	.527	**.881**	-.966	1.124
	Sunday	.984	.511	**.057**	-.028	1.996
Thursday	Friday	1.562*	.719	**.032**	.137	2.987
	Saturday	1.526*	.594	**.012**	.348	2.703
	Sunday	2.431*	.633	**.000**	1.177	3.685
Friday	Saturday	-.036	.536	**.947**	-1.097	1.025
	Sunday	.869	.567	**.128**	-.254	1.993
Saturday	Sunday	.905*	.424	**.035**	.065	1.745

In order to assess which days differ in positive affect, the former were compared in pairs. The results, presented in Table 2, reveal that on Thursday the intensity of positive affect is significantly higher than on the other days, whereas on Sunday it is lower than on the other days – on the level of significance or at least on the level of a statistical trend. The remaining days do not differ from one another.

Circaseptan variability of negative affect

Below presented are the results of repeated-measures analysis of variances for the variable of negative affect. The results are illustrated in Figure 2.

Table 3 presents the results of the tests of intra-object effects related to the circaseptan variability of negative affect. The results reveal that on various days of the week, the intensity of negative affect is statistically significantly different among the same test participants. One should note, however, that, again, the value of Eta is very low, which means that the dependence is rather weak.

In order to assess which days differ in negative affect, the former were compared in pairs. The results, presented in Table 4, reveal that on Friday and Saturday the average intensity of negative affect is significantly lower than on the other days except for Sunday, yet Friday and Saturday do not differ significantly from each other. The remaining weekdays do not significantly differ from one another. In case of Sunday, the results are lower than on the other days, yet the difference is significant only on the level a statistical trend.

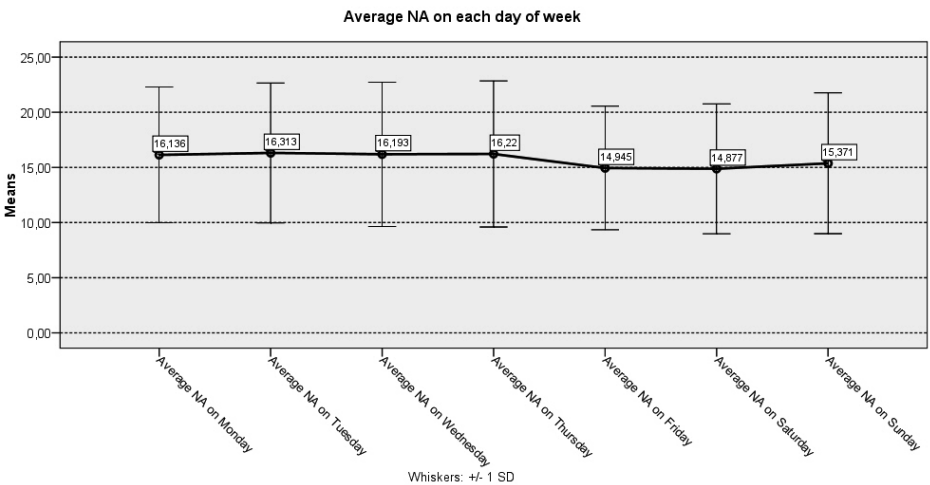

Figure 2. Level of negative affect averaged on successive days of the week.

Table 3 – *Results of tests of intra-object effects of negative affect – day of the week*

Source		Sum of squares	df	Average square	F	Sig.	Partial Eta^2
Day	Assumed sphericity	276.540	6	46.090	3.464	.002	.029
	Greenhouse-Geisser	**276.540**	**5.248**	**52.691**	**3.464**	**.004**	**.029**
	Huynh-Feldt	276.540	5.529	50.017	3.464	.003	.029
	Lower-bound	276.540	1.000	276.540	3.464	.065	.029
Error	Assumed sphericity	9182.019	690	13.307			
	Greenhouse-Geisser	9182.019	603.555	15.213			
	Huynh-Feldt	9182.019	635.820	14.441			
	Lower-bound	9182.019	115.000	79.844			

Table 4 – *Comparisons of pairs of successive days of the week in relation to negative affect*

(I) day	(J) day	Average difference (I-J)	Standard difference error	**Sig.**	95% range of difference confidence	
					Lower limit	Upper limit
Monday	Tuesday	-.158	.405	**.697**	-.961	.644
	Wednesday	-.095	.517	**.855**	-1.118	.929
	Thursday	-.078	.482	**.872**	-1.032	.877
	Friday	1.194*	.473	**.013**	.258	2.130
	Saturday	1.227*	.571	**.034**	.096	2.358
	Sunday	.754	.458	**.102**	-.153	1.662
Tuesday	Wednesday	.063	.460	**.891**	-.849	.975
	Thursday	.080	.431	**.852**	-.773	.934
	Friday	1.352*	.453	**.003**	.455	2.249
	Saturday	1.385*	.480	**.005**	.434	2.336
	Sunday	.912*	.460	**.050**	.001	1.823
Wednesday	Thursday	.017	.427	**.968**	-.828	.862
	Friday	1.289*	.442	**.004**	.414	2.164
	Saturday	1.322*	.575	**.023**	.184	2.460
	Sunday	.849	.490	**.086**	-.121	1.820
Thursday	Friday	1.272*	.507	**.014**	.267	2.276
	Saturday	1.305*	.512	**.012**	.290	2.319
	Sunday	.832	.479	**.085**	-.117	1.781
Friday	Saturday	.033	.474	**.944**	-.905	.971
	Sunday	-.440	.466	**.347**	-1.362	.483
Saturday	Sunday	-.473	.462	**.308**	-1.388	.442

Circadian variability of positive affect

Below are presented the results of repeated-measures analysis of variances for the variable of positive affect. The results are illustrated in Figure 3.

Table 5 presents the results of the tests of intra-object effects, revealing that positive affect is significantly and statistically different depending on a time of the day. One should also note that the value of Eta is significantly higher than in case of the so-far dependences, which means that the dependence/relation is significantly stronger. Circadian differences of positive affect are significant.

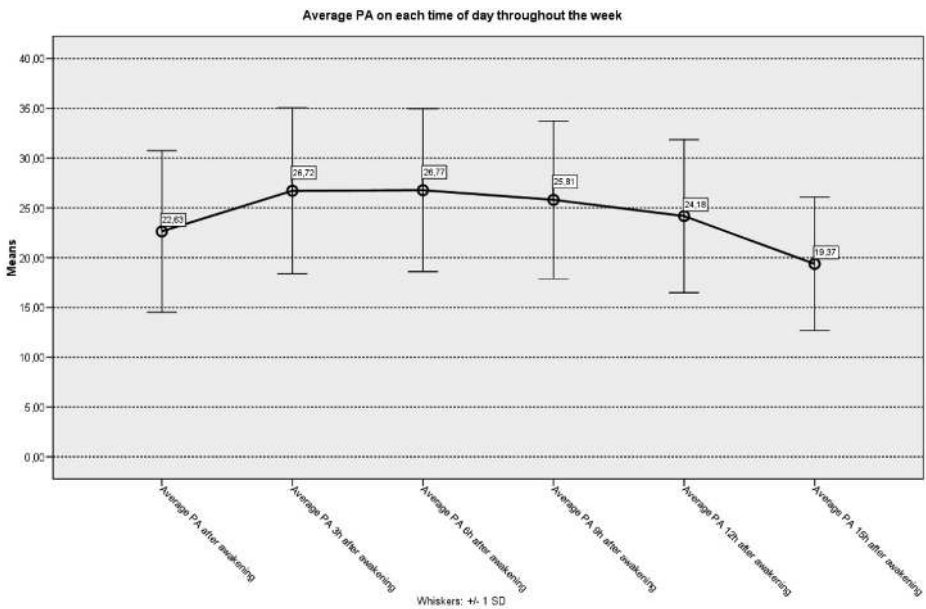

Figure 3. Level of positive affect averaged at successive times of the day.

Table 5 – *Results of tests of intra-object effects of positive affect – time of the day*

Source		Sum of squares	df	Average square	F	Sig.	Partial Eta^2
Day	Assumed sphericity	4793.033	5	958.607	94.085	**.000**	.450
	Greenhouse-Geisser	**4793.033**	**3.261**	**1469.654**	**94.085**	**.000**	**.450**
	Huynh-Feldt	4793.033	3.368	1423.189	94.085	**.000**	.450
	Lower-bound	4793.033	1.000	4793.033	94.085	**.000**	.450
Error	Assumed sphericity	5858.542	575	10.189			
	Greenhouse-Geisser	5858.542	375.053	15.621			
	Huynh-Feldt	5858.542	387.298	15.127			
	Lower-bound	5858.542	115.000	50.944			

In order to assess which times of the day differ in positive affect, the former were compared in pairs. The results are presented in Table 6.

Table 6 – *Comparisons of pairs of successive times of the day in relation to positive affect*

(I) time	(J) time	Average difference (I-J)	Standard difference error	**Sig.**	95% range of difference confidence	
					Lower limit	Upper limit
after awakening	after 3h	-4.085*	.370	**.000**	-4.817	-3.353
	after 6h	-4.142*	.405	**.000**	-4.943	-3.340
	after 9h	-3.175*	.419	**.000**	-4.005	-2.345
	after 12h	-1.544*	.520	**.004**	-2.574	-.515
	after 15h	3.262*	.543	**.000**	2.186	4.339
after 3h	after 6h	-.057	.228	**.804**	-.508	.395
	after 9h	.910*	.311	**.004**	.293	1.527
	after 12h	2.541*	.433	**.000**	1.683	3.398
	after 15h	7.347*	.521	**.000**	6.315	8.380
after 6h	after 9h	.967*	.239	**.000**	.493	1.441
	after 12h	2.597*	.412	**.000**	1.782	3.413
	after 15h	7.404*	.509	**.000**	6.396	8.412
after 9h	after 12h	1.631*	.329	**.000**	.978	2.283
	after 15h	6.437*	.454	**.000**	5.538	7.337
after 12h	after 15h	4.807*	.430	**.000**	3.955	5.659

Table 7 – *Results of tests of intra-object contrasts of positive affect – time of the day*

Source	dependence	Sum of squares	df	Average square	F	**Sig.**	Partial Eta^2
hour	linear	1027.465	1	1027.465	47.437	**.000**	.292
	square	**3621.059**	**1**	**3621.059**	**256.602**	**.000**	**.691**
	cubic	18.376	1	18.376	2.493	**.117**	.021
	4-th degree	126.108	1	126.108	22.860	**.000**	.166
error	linear	2490.861	115	21.660			
	square	1622.834	115	14.112			
	cubic	847.662	115	7.371			
	4-th degree	634.400	115	5.517			

The analysis of the results in the table indicates that all the times of the day differ as to the intensity of positive affect, except for the measurements after 3 and 6 hours, which in the group under discussion are insignificantly different. The intensity of positive affect proves low shortly after the awakening to rapidly grow after 3 hours and remain on this level after 6 hours, to gradually decrease after 9 and 12 hours not reaching, however, the

level observed immediately after the awakening. After 15 hours the intensity of positive affect falls sharply to all-day low (lower than after the awakening).

The results clearly indicate curvilinear dependence, best described by a second-degree polynomial and a parabolic curve; this being confirmed by the tests of intra-objects contrasts presented in Table 7. The effect described by the second-degree curve reaches the highest value of test F.

Circadian variability of negative affect

Below presented are the results of repeated-measures analysis of variances for the variable of negative affect. The result of the test of intra-object effects is presented in Table 8.

Table 8 – *Results of tests of intra-object effects of negative affect – time of the day*

Source		Sum of squares	df	Average square	F	Sig.	Partial Eta^2
Day	Assumed sphericity	34.038	5	6.808	1.579	**.164**	.014
	Greenhouse-Geisser	**34.038**	**3.306**	**10.297**	**1.579**	**.189**	**.014**
	Huynh-Feldt	34.038	3.415	9.967	1.579	**.188**	.014
	Lower-bound	34.038	1.000	34.038	1.579	**.211**	.014
Error	Assumed sphericity	2479.022	575	4.311			
	Greenhouse-Geisser	2479.022	380.149	6.521			
	Huynh-Feldt	2479.022	392.744	6.312			
	Lower-bound	2479.022	115.000	21.557			

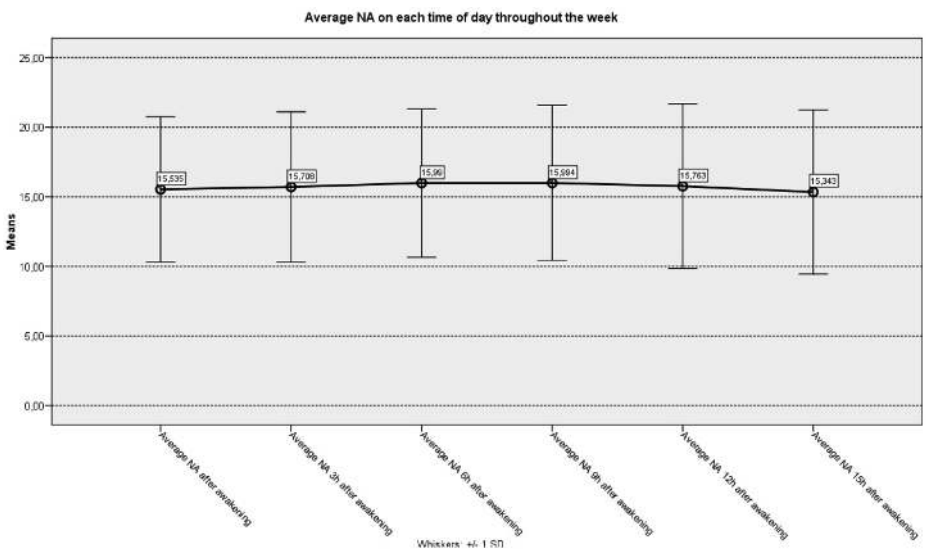

Diagram 4. Level of negative affect averaged at successive times of the day.

It is clearly visible that the time of the day does not significantly differentiate the intensity of negative affect. Therefore, the comparisons of pairs were not carried out due to their groundlessness. Figure 4 illustrates the course of negative affect in case of circadian variability.

Discussion

The objective of this research was to describe circadian and circaseptan changes in experiencing positive and negative affects. Positive affect (PA) was taken into consideration as a factor independent of negative affect (NA). The so-far research showed that the researchers using various testing methods recognize the circadian rhythm for both PA and NA. Also the latest analyses of circaseptan rhythms (Cornelissen et al. 2005) provide evidence for the rhythmicality of affective experiences. Although such analyses still require confirmation in further research.

The results revealed that subjects experience significantly higher positive affect on Thursday rather than on others six days. Positive affect is the lowest in Sunday. The result confirms the data gathered by other authors stating that the most intense positive emotions may be experienced during the working week as these are attached to social interactions. The researchers indicated that people tend to experience their highest well-being, reported as high level of happiness, energy and enthusiasm, when they are socially and physically active. The analysis of the results also justifies reasoning that Sunday as a day off, is not characterised by the highest indications of positive affect. Data gathered in other tests confirm that on Sunday many people report an increase in sadness and disengagement, which still remains unclear and is subject to further research (Watson, 2000). Possibly, the sense of being involved and included gives people the sense of belonging and being needed (Baumeister & Leary, 1995). Research on the society of today indicate that in most countries the pace of life revolves around work; in western Europe being more intense than in Brazil, Indonesia or Mexico. On this list Poland occupies the twelfth position, being several places higher than the United States. Human activity is increasingly characterised by higher intensity of professional tasks carried out under time pressure and subject to growing requirements. While trying to reconcile professional challenges with their role in the family, humans may experience psychological tension and sense of discomfort. While observing circaseptan changes Americans researchers also noticed a weekly mood rhythm characterised by gradually growing positive affect from Sunday until Tuesday followed by its fall on Thursday and a slight growth towards the end of the week(Clark et al., 1989; Cornelissen et al., 2005). The weekend seems to be less characterized by positive affect due to the fact that anticipation of events is connected with more positive emotions than experiencing of the actual events. It has been established that negative affect remains on a similar level on all weekdays except Friday and Saturday, when it slightly drops, only to start climbing again on Sunday and stay the same for the subsequent days of the week. The obtained results have shown that during the week a negative affect is slightly increased in comparison with the weekend, which may indicate that in spite of experiencing many positive emotions, we still experience independent negative emotions connected, for instance, with stress or tiredness.

The results of circadian analyses show distinct differences within the scope of positive affect experienced at different times of the day. They confirm the presence of the circadian variability of positive affect. Similar data with reference to negative affect were not confirmed in the group subject to testing. The so-far affect-related tests including 3-hour intervals (Clark & Watson, 1988; Clark et al., 1989; Cornelissen et al., 2005; Murray et al., 2002) confirm circadian variation in positive affect. Researchers studied American population (Clark et al., 1989; Cornelissen et al., 2005). indicated that positive affect grows during the day until afternoon to fall at night-time. Researchers analyse individual human potential by testing rhythms e.g. circadian ones. The obtained result allow a conclusion that a daily emotional state regulated by a biological clock (Mitsutake et al., 2001). In the surveyed Polish population, one has observed that positive affect is increasing until afternoon hours, then it reaches its peak and starts to decrease after nine hours after the awakening to reach its lowest range at night – fifteen hours after the awakening. What is interesting is that one has not observed any essential circadian changes within the scope of negative affect, which proves that negative emotions remain on the same steady level throughout the day.

Conclusion

Statistical results have indeed confirmed the rhythmic variability of positive affect in an individual in their circadian activity as well as circaseptan rhythmicality within the scope of positive and negative affect. The analysis of the circadian rhythm confirms the influence of the biological clock on the psycho-biological functioning of a human being (endogenous influence). Social synchronizers, such as periods regulated by social activity (professional or educational one), are most likely to have influence, too. The observed circaseptan changeability of positive and negative affect occurs mainly as the consequence of social synchronizers. The knowledge about the affect rhythmicality may be used in preparation of social and occupational activities in the periods of the highest index for positive affect and avoidance of planning any activities in the periods of the highest negative index. The awareness of PA and NA rhythmicality allows planning the time of rest in the periods of the lowest positive affect index and the highest negative affect index.

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PART 3

TIME PERSPECTIVE, HEALTH AND WELL-BEING

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Chapter 13

Time Perspective, meaning in life and subjective well-being in Macedonian undergraduate students

Marija Shterjovska
Elena Achkovska-Leshkovska
Faculty of Philosophy, Ss. Cyril and Methodius University, Republic of Macedonia
stermar86@gmail.com
eleskovska@yahoo.com

Abstract: According to previous studies, there is strong relationship between some factors of Zimbardo's time perspective model and well-being, between meaning in life and well-being, as well as between time perspective and meaning in life. Having in mind that similar research haven't been conveyed so far in Republic of Macedonia, the goal of this study was to test inter-correlations among mentioned variables and to explore whether time perspective and meaning in life are significant predictors of the subjective well-being. Participants were undergraduate psychology students from University "Ss Cyril and Methodius" in Skopje. They have completed surveys that assessed time perspective (ZTPI), meaning in life (MLQ) and subjective well-being (PANAS and SWLS). The results have shown that subjective well-being is associated with presence of meaning in life, orientation toward present pleasure (PH), sentimental attitude toward the past (PP) and lack of negative view of the past (PN). Furthermore PH and PP appeared important for presence of meaning in life, while future orientation was associated with search of meaning in life. Finally, it was found that presence of meaning in life and Past-Negative factor significantly predict students' subjective well-being. Overall, the evidence indicates that most of the previous findings are valid for Macedonian context as well.

Keywords: time perspective, meaning in life, subjective well-being.

Introduction

Well-being is a core topic of research in the positive psychology because it deals with many aspects of psychological health as an eternal desirable state of every human being. The most representative ingredients of psychological well-being are happy feelings brought on by something we enjoy and the feeling that what we are doing with our lives has some meaning and purpose. The first, more hedonic facet, refers to Subjective Well-being (SWB) as "person's cognitive and affective evaluations of his or her life" (Diener, Lucas & Oshi, 2002, p.63). There appear to be at least three major components to subjective well-being: pleasant emotions and moods, lack of negative emotions and moods and satisfaction judgments about one's life. The second facet, the eudemonic one, refers to the extent to which people comprehend, make sense of, or see significance in their lives, accompanied by the degree to which they perceives themselves to have a purpose, mission, or over-arching aim in life (Steger, 2009)

Beside Presence of Meaning in Life (PML), Search of Meaning in Life (SML) is another crucial dimension that is especially relevant for the adolescents. As they search for meaning both within themselves as well as in the outside world, they are trying to set themselves on a path towards happiness and a full enjoyment of life. During their transition to adulthood, adolescents are facing wide range of difficulties, challenges and changes. In order to encourage a smooth transition it is important to determine their psychological well-being.

Additionally, adolescents are comprised of who they were as children, who they are now and who they wish to become (De Lazzari, 2000). This cognitive operation that implies both an emotional reaction to imagined time zones and a preference for a locating action in past, present or future is named time perspective. The time perspective construct, developed by Zimbardo & Boyd (1999), consist of five factors, which promotes different attitudes toward temporal frames. Orientation toward past could be positive or negative. *Past-Positive* (PP) reflects a warm, pleasurable, often sentimental and nostalgic view of one's past with maintaining relationships with family and friends. *Past-Negative* (PN) is characterized by personal experiences that were aversive, traumatic or unpleasant. Orientation toward present could be hedonistic or fatalistic. *Present-Hedonistic* (PH) refers to living in the moment, in the here and now, pleasure seeking, enjoying high intensity activities, seeking thrills and new sensations and openness to adventures. *Present-Fatalistic* (PF) is associated with helplessness, hopelessness and a belief that outside forces control one's life, for e.g. spiritual or governmental forces. Finally, *Future* orientation (F) is concerned with working for future goals and rewards, often at the expense of present enjoyment, delaying gratification and avoiding time-wasting temptations.

Time perspective can become a relatively stable personality trait when a particular temporal bias predominate one's outlook and behavior. When people frequently exhibit one dominant temporal orientation, they may become dysfunctional (Boniwell, 2005). Thus, Zimbardo & Boyd (1999) promoted the ideal of "balanced TP"(BTP) as optimal for individual psychological health and social functioning. It is defined as the mental ability to switch flexibly among different TP factors depending on situational conditions.

Previous research

Investigating correlates of well-being and time perspective factors, Drake et al. (2008) reported positive correlations between subjective happiness and PP, as well as PH. On the other hand, subjective happiness was negatively correlated to PN. Surprisingly, there was no significant correlation between happiness and F. Boniwell (2005) reported various studies with non-consistent results regarding association between well-being and some factors of time perspective, except the consistent positive correlation with PP and the negative one with PN.

Well-being is often put in relationship with another construct of positive psychology – presence of meaning in life. According to many studies, they are in strong positive relationship (Reker, Peacock & Wong, 1987; De Lazzari, 2000; Cairns, 2010). Also the other dimension of the meaning in life, search for meaning in life, appeared to have significant correlation with well-being, but the findings are not consistent about the direction of this relation. Search for meaning in life is in positive relationship with variables that refer to psychological distress such as anxiety, depression, negative affect, neuroticism

etc. (Steger et. al. 2006). This dimension is differently associated to well-being across the human life span (Steger, Oishi, & Kashdan, 2009). Searching for meaning in life is more strongly associated with well-being deficits in later life stages, while in adolescence it is adaptive and therefore might be unrelated to well-being. Even more, in another recent study it was concluded that SML has moderating role in positive correlation between PML and satisfaction in life (Steger, Oishi & Kesebir, 2011).

Time perspective was also significantly correlated to dimensions of meaning in life. Steger et. al. (2008) found positive connection between PML and certain factors of time perspective such as PP, F and PH, as well as negative with PN. Positive correlation was also detected between SML and the factors PN, F and PF (Zimbardo & Boyd; 1999; Steger et. al., 2008).

Well-being in Macedonian context

According to Rank Report within World Database of Happiness (Veenhoven, worlddatabaseofhappiness.eur.nl), Macedonian general population sample score 4.7 on scale 0 to 10 regarding how much people enjoy their life-as-a-whole. This report is made on the basis of surveys implemented in 149 nations during the period 2000-2009. Compared with others ex-communist developing countries in the region, who shared similar experiences in the period of transition toward democratic society, average happiness of Macedonian population is slightly higher only from Bulgarians and Albanians. This relatively low rank is understandable having in mind the high rate of unemployment, as well as some others factors that reveal heritage of unpleasant past experiences on a collective level.

Unfortunately, there is very few research regarding well-being and related concepts conducted in the Republic of Macedonia. One recent study (Spasovski, 2009) aimed to explore the relation between subjective well-being, basic psychological needs (BPN), intrinsic and extrinsic life goals (LG), and orientation toward collectivism among undergraduate students. Results show that all BPNs, intrinsic and extrinsic LGs significantly correlated with SWB. Moreover, realization of extrinsic goal, for status/fame, contrary to intrinsic one, appeared to be significant predictor of SWB. According to the author, findings suggest that probably the realization of extrinsic goals has a complementary role to the achievement of intrinsic goals in satisfying one's basic needs and increase of SWB. Additionally, it is found that SWB is positively related with the orientation toward collectivism, that imply the importance of more positive and less negative life experiences with family and friends.

Present study

The previous findings illuminate a small part of the SWB issue in Macedonian cultural context, but it is far from giving the whole picture. In order to enrich this research field, and to give pioneer contribution to national psychological science, we introduce investigation of time perspective and meaning in life with adolescents as participants. The aim of this study was to examine how factors of time perspective and dimensions of meaning in life are connected to subjective well-being as well as which of the mentioned variables, if any,

can predict subjective well-being. Also, we were interested whether there is relationship between factors of time perspectives and dimensions of meaning in life.

According to the literature review of theoretical and researching studies on these topics (Drake et al.,2008; Zimbardo & Boyd,1999; Steger et. al. 2008; Reker, et al., 1987; De Lazzari, 2000; Cairns, 2010) it was hypothesized that SWB would be positively correlated with PML, PP, PH and F time perspective, while negatively correlated with SML, PN and PF. Furthermore, PML was assumed to correlate positively with PP, PH and F, while negatively with PN. SML was hypothesized to be in positive correlation with PN, PF and F. Finally, based on the previous findings (Boniwell, 2005; Steger, et al., 2011) it was proposed that PP, PN and PML would be predictors of SWB.

Method

Participants and Instruments

The data for this study were collected in the winter of 2012. We tested 81 female students from the Department of Psychology in the oldest university in the Republic of Macedonia. Participants of this study were 18 to 22 years old with age average of 19.2. They were given a questionnaire booklet contained the following instruments:

ZTPI – Zimbardo Time Perspective Inventory, (Zimbardo & Boyd, 1999). The 56-item scale consists of 5 subscales measuring 5 factors of time perspective: Past Positive, Past Negative, Present Hedonistic, Present Fatalistic and Future.

MLQ – Meaning in Life Questionnaire, (Steger et al., 2006). This 7-point Likert scale consists of 10 items assessing 2 dimensions: Presence of Meaning in Life and Search for Meaning in Life.

PANAS – Positive and Negative Affect Schedule, (Watson & Clark, 1988). The scale consists of 20 items, 10 related to positive affects (PA) and 10 to negative affects (NA).

SWLS – Satisfaction with Life Scale, (Diener et al., 1985). This 7-point Likert scale consists of 5 items assessing global judgment of satisfaction with life.

Numerous studies have demonstrated high reliabilities for the mentioned scales in many different cultures. The first two scales are for the first time used in Macedonian context, so their reliability was tested. In the Macedonian sample Cronbach's alphas for ZTPI subscales were: .55 for Past Positive, .71 for Past Negative and for Hedonistic Present, .62 for Fatalistic Present and .74 for Future. The current sample alphas for MLQ subscales were: .72 for Presence of Meaning in Life and .83 for Search for Meaning in Life.

The last two scales are used to measure the construct subjective well-being which is combination of cognitive and affective dimensions (Diener, Lucas & Oshi, 2002). The variables that determine subjective well-being were transformed into standardized scores (*z* scores) before calculating subjective well-being with the following formula: SWB = SWLS + (PA – NA).

Results and Discussion

Table 1 provides a summary of the correlations, means and standard deviations for all of the measured variables. It is obvious that subjective well-being is significantly associated

with the following variables: PML (r=.309, p<.01), PH (r=206, p<.05), PP (r=.259, p<.01) and PN(r=.-.391, p<.01). Furthermore, PML has positive correlation with PH (r=.272, p<.01) and with PP (r=.211, p<.05). Finally, SML is positively related to PN (r=.222, p<.05) and to F (r=.325, p<.01).

Table 1 – *Correlations, Means and Standard Deviations for Subjective Well-Being, Time Perspective Factors and Meaning in Life Dimensions (N=81)*

Scales	PP	PN	PH	PF	F	PML	SML	SWB
PP	_	-.187*	.209*	.032	.326**	.211*	.154	.259**
PN		_	-.203*	.314**	.167	-.154	.222*	-.391**
PH			_	.211*	-.286**	.272**	-.037	.206*
PF				_	-.026	-.089	.124	-.099
F					_	.170	.325**	-.056
PML						_	-.040	.309**
SML							_	-.046
SWB								_
M	3.62	2.84	3.72	3.14	3.47	26.28	25.48	-.04
SD	.46	.58	.42	.51	.50	5.08	6.21	1.59

* p< .05. ** p<.01

These results confirm the thesis that people need an important tool to give meaning to their lives and control it, and that tool is time (Eryılmaz, 2011). The subjective judgment of individual well-being depends on temporal orientation. As Durayappah (2011, p.30) points out in his 3P Model, "SWB is a temporal component, for we not only desire to pursue happiness (Prospect), but also to experience it (Present), as well as protect our previously acquired happiness (Past)". We measure our SWB in each temporal state based on the pleasure derived from expecting, experiencing or evaluating and therefore our preferences toward a certain state influenced our overall SWB.

According to the findings in our study, SWB of Macedonian female undergraduates is mainly derived from pleasurable views of previous interpersonal relationships with family and friends and capability to avoid anxieties and depressive thoughts and feelings. One possible interpretation of the results is the fact that Republic of Macedonia was ex-communist country and before its independency, 20 years ago, it was part of the Yugoslav Federation. Within the Federation, popular slogan was "brotherhood and unity" and it determined collectivistic orientation as one of the core values. It might be beneficial to be a collectivist in a collectivistic country because patterns of relations with the important others create more positive and less negative life experiences. Although nowadays young generations are more and more influenced by Western individualistic lifestyle (i.e. competitive and individual focused), yet collectivistic tradition of their parents is not easily replaceable.

Positive significant correlation between SWB and PH confirmed the expectation that adolescents' judgment of their satisfaction with life is due to the great pleasure they obtained from ongoing adventures of the moment, highly intense activities and excitements found in the here and now. There are several reasons that might explain this relation. First of all, hedonism is more typical for adolescents than for adults. Furthermore, as Boniwell (2005) stated, people living in southern areas and those with collectivistic orientation tend to be more present-oriented. Those characteristics are representative for inhabitants in our country, too. Additionally, the lack of optimistic view for future opportunities in Macedonian setting, make adolescents compensate it with daily enjoyment and activities that bring pleasure here and now.

Meaning in life is one of the most investigated variables related to SWB. Alike the results in current study, plenty of other investigations have shown that succeeding in finding meaning in life promotes psychological well-being (Steger et. al. 2006, 2008, 2011; Lazzari 2000; Rathi & Rastogi, 2007; Mulders, 2011). It is understandable because eudemonic view of well-being stresses the importance of both pleasure and meaning in life. In other words, pursuing meaningful and pleasurable activities can significantly raise one's levels of well-being (Ben-Shahar, 2007).

Fruitful ground provided by pleasant memories of the past give potential sources for meaning in life. Past investigations have revealed that most contributing source of meaning in life among adolescents is their relationship with friends, partners and family. (Steger, et al., 2011; Mulders, 2011). Having in mind that PP orientation involves warm personal interactions as most dominant characteristic, it is clear why PP and PML are in significant positive correlation. Besides pleasant past experiences, meaning can be drawn from joyful moments on daily bases, too. Mulders (2011) suggests that post modernist youths meet a new challenge in a society with diverse orientations and are provided with more freedom and autonomy than generations before. As a result young people refuse to adopt an ideological framework, thus orienting toward more mundane, hedonistic ideas about meaning in life. As the author hypothesized, almost half of the adolescents participated in his study, mentioned pleasure as provider of meaning in life.

Significant correlations between SML and TP factors obtained in this study are consistent with those reported in similar ones. After analyzing several researches in this field, Steger et.al. (2008) concluded that SML might exemplify an inability to let go of painful past experiences (PN). In one previous study (Steger et.al., 2006), it was revealed that SML is in strong positive relation with neuroticism, depression and negative emotions, which is congruent with the unpleasant psychological states of individuals with PN focus. Having no stable ground for meaning in life derived from the meaningful past events, it appears that adolescents are stimulated to search for meaning in their future goals. With the focus on future time perspective, they make efforts to establish significance and purpose of their lives.

Although it could be easily assumed that PP is the essential time perspective for the individual's well-being and therefore developing it is the best one could do, Boniwell (2005) warns about its drawbacks and bad consequences of every excessive orientation. She further developed Zimbardo & Boyd's model of ideal time perspective, suggesting that balanced time perspective is optimal for human functioning (Boniwell & Zimbardo, 2004). According to the model, individuals with BTP profile show moderate to high scores on PP, F and PH and low scores (below 33 percentile) on PN and PF.

In our sample, only 6 out of 81 participant (7.4%) performed balanced TP profile, which means that flexibility and "switch-ability", as essential components of balanced TP, are not common for Macedonian undergraduate female students. Having in mind that according to previous findings BTP is hard to achieve (Boniwell, 2005, Drake et al., 2008) we can conclude that this is not exclusively the case in the current study.

This study found that the most prevalent temporal frame profile constitute individuals with moderate to high scores in all five TP factors. Compared with an ideal BTP profile (http://www.thetimeparadox.com), shown in Figure 1, it is evident that they achieved higher scores in the risk factors of PF and PN, while F is not quite remarkable orientation. This image is characteristic for the developing countries, such as Republic of Macedonia, where poverty and unemployment are common features of the society. These conditions do not offer optimistic expectations for young people, so they believe that future is uninfluenced by their individual actions, but it is controlled by external factors. Also, facing the negative consequences of long-lasting transitional period in the country during their childhood, they could have painful memories and aversive attitude toward past.

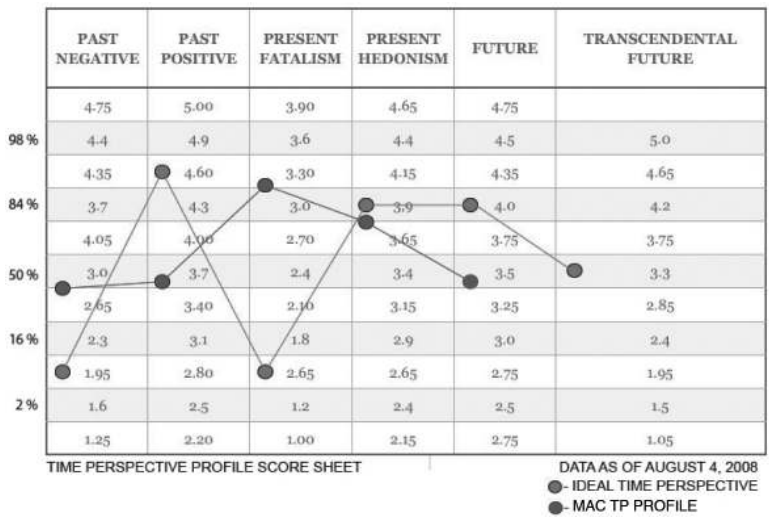

Figure 1. Comparison of ideal balanced time perspective profile and Macedonian sample time perspective profile.

Note. Ideal ??? ??? were retrieved from www.thetimeagnadox.com

Finally, in order to determine to what extent meaning in life and TP factors predict subjective well-being, multiple regression analysis method was used. For that purpose, method Forward was chosen, with .05 probability of F to enter.

Table 2 shows obtained coefficient of determination, while coefficients of regression models for SWB are presented in Table 3.

Table 2 – *Multiple Regression Analyses Predicting Subjective Well-Being from Time Perspective Factors and Meaning in Life Dimensions*

Model	R	R^2	Adj.R^2	F	Sig. F	R^2 Chg.	F Chg	p
1. PN (Constant)	.391	.153	.142	14.281	.000	.153	14.281	.000
2. PN PML (Constant)	.465	.217	.197	10.783	.000	.064	6.323	.014

Table 3 – *Coefficients of Regression Models for Subjective Well-Being*

Model	B	SE	β	p
1. PN (Constant)	-1.071 3.001	.283 .822	-.391	.000
2. PN PML (Constant)	-.963 .080 .596	.278 .032 1.244	-.352 .255	.001 .014

According to the findings, both Past Negative and Presence of Meaning in Life explain Subjective Well-being of adolescents at a significant and important level (R=.465, R^2=.217, F=10.783, p<.01). It was concluded in regression analysis that PN was significantly and negatively correlated with SWB (β= -.352, p<.00), while PML was positively correlated with SWB on significant level (β= .255, p<.01). Thus, predictor variables explain significant part of the variance of subjective well-being: 14% of the variance is explained only with lack of Past Negative, while 20% of variance is explained with both lack of Past Negative and Presence of Meaning in Life. This finding suggest that Macedonian female undergraduates who perceive themselves to have a purpose in life, in one hand, and do not hold negative views about their past, on the other hand, are more likely to develop positive judgment of their overall life.

Conclusion

In sum, the present study confirmed the findings from previous ones that subjective well-being has strong relation with presence of meaning in life among adolescents. It seems that the hedonic concept of well-being is insufficient for understanding why people are satisfied with their lives, and therefore it is necessary to broaden the concept in a more eudemonic manner. The same standpoint is promoted in Ben-Shahar's Hamburger model (2007, p.33): "A happy person enjoys positive emotions while perceiving life as purposeful… We need to gratify both Freud's will for pleasure and Frankl's will for meaning if we are to lead a fulfilling, happy life."

Also, it was found that Macedonian adolescents are more past oriented than oriented toward future goals, that could be interpreted with some cultural features mentioned in the discussion. Moreover, their subjective well-being mostly relays on benefits from their past positive experiences and lack of past negative ones.

The results might suggest some practical implications that will help to increase adolescents' subjective well-being. Youths should be open to think about different sources of meaning that have personal significance for them. Also, relying on their past experiences, they should be stimulated on the process of meaning making driven not only from the pleasant past events, but also from the traumatic ones. According to Frankl (1977), meaning could be found not only in relations with the surrounding and occupation, but also in traumatic experiences. As a father of logotherapy, he suggests that through the process of logotharapy, it is possible to reveal meaning in the suffering by its acceptance and explaination with some higher goals. Finally, having more flexible attitude and developing switch-off ability in accordance to the external circumstances and personal needs, adolescents should learn how to balance their time perspectives.

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Chapter 14

Transition to higher education: lifestyle changes, health condition and academic success of first-year students

Andreia Soares
Marco Pereira
José Canavarro
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal
andreiamsoares2@gmail.com

Abstract: Lifetime normative transitions, which include significant ecological structural changes, as transition to higher education, constitute a risk factor in the adoption and maintenance of healthy lifestyles. Health behaviours and attitudes (HBA) that integrate personal lifestyle are variables that influence students' health condition and academic success. Objectives and sample: A sample of first-year students (N = 546) from the University of Coimbra, from the academic year 2009/2010, was collected in order to study "students in transition" (1) perception of occurred and desirable changes in seven HBA sets of their lifestyle and its impact perceived in subjects overall health, adaptation process and academic performance; (2) actual health condition and academic success; and (3) the influence of some HBA on these variables. Main results: Although the prevalence of HBA has changed with transition, most of the students have changed/maintained a healthy lifestyle, except for alcohol consumption and physical/sports activity. These two HBA played an important and conflicting role in health condition, as well as in academic success. Conclusions: Most of the results are consistent with the literature and provided important information for planning a health and academic success promotion intervention project in this specific context.

Keywords: academic success, health condition, health behaviours/attitudes, higher education, transition.

Introduction

Transition periods represent always, regardless of when they occur in lifespan, (the perception of) instability or discontinuity and adjustment, which requires in most cases changes in patterns of behavioural, cognitive and emotional responses (Almeida, Soares & Ferreira, 2000; Reich, Harber & Siegel, 2008) and mobilization of available resources (Seabra, 2007). Transition to higher education appears to be a specific process that falls within transition processes in general, in a transitional perspective (Pinheiro, 2004), and is often experienced by students as the most desired but simultaneously difficult process, because of educational, ecological and developmental changes involved in it (Pinheiro, 2004; Pittman & Richmond, 2008). While most students are able to cope with the diversity of changes and to succeed in adaptation/adjustment process (or in transition process answer), others students experience (psychological, emotional, physical or social) health problems,

that may compromise not only *health condition* (level of health of an individual, family or community at a given point in time, which can be assessed either by objective indicators or by more subjective measures; Fleck, 2008), but also *academic success* (here understood as a broader concept than academic performance or retention rate; thus, its assessment also includes personal, educational, social and vocational experiences of students; Upcraft, Gardner, Barefoot & Associados, 2005) and precipitate studies interruption or cessation, during or at the end of the academic year (DeBerard, Spielmans & Julka, 2004; Rayle & Chung, 2008).

During the past two decades, *health-related behaviours and attitudes* or HBA (set of actions and relatively enduring organizations of beliefs, feelings and behavioural tendencies usually grouped into two broad categories, based on their impact on health: (1) positive HBA, such as tobacco abstinence, physical/sports activity or others which may protect or optimize health condition, and (2) negative HBA, such as excessive alcohol consumption, poor sleep hygiene, among others which may be damaging to health condition; Odgen, 2004) that integrate personal lifestyle of higher education students have been widely investigated, for purposes as epidemiological reasons, behaviour predictors studies (the investigation carried out by Wardle and Steptoe, since 1989, is a paradigmatic example), relationship between those variables and health/disease related variables (well-being, quality of life, stress, etc.; cf., p.e., Dusselier, Dunn, Wang, Shelley II & Whalen, 2005; Grant, Wardle & Steptoe, 2009; Seabra, 2007) or academic success (cf., p.e., DeBerard, Spielmans & Julka, 2004; Elias, Azevedo & Maia, 2009) analyses. Although most of the young adults in tertiary education do not present negative HBA, some researchers call attention to the role of the adaptation process to higher education in the acquisition of unhealthy habits: psychoactive substances use or insufficient sleep can result from (1) stress induced by multiple changes (growing responsibility and autonomy in their personal and academic experiences, for instance) and by assessment periods (Dusselier et al., 2005) or (2) social intercourse with peers with unhealthy personal lifestyles, while parental monitoring decreases (Precioso, 2004). In general, a healthy lifestyle (in particular, an adequate sleep pattern, regular exercise that doesn't steal time from academic tasks, or absence of excessive consumption of alcohol and tobacco) provides higher levels of health and well-being (Vaez & Laflamme, 2003) and academic performance (DeBerard, Spielmans & Julka, 2004; Elias, Azevedo & Maia, 2009; Trockel, Barnes & Egget, 2000), as well as academic success, life satisfaction and absence of stress inducers have been found to predict the avoidance of negative HBA and the expression of HBA positive to students' health (Grant, Wardle & Steptoe, 2009).

Method

Sample

546 first-year students from the academic year 2009/2010 were recruited from all 8 faculties of the University of Coimbra. Mean age of participants was 18.7(*SD* = 1.0), with the youngest participant being 17 years old and the oldest 24 years old. Women constituted 58% of the sample. The majority of the participants was Portuguese (96%; 72% had left home to attend university), single (100%) and from average (45%) and low (34%) socioeconomic levels.

Procedure

All participants received information about the purpose and content of this cross-sectional study and they gave informed consent about voluntary participation. Full confidentiality was guaranteed. Implementation of the evaluation protocol took place from March to May of 2010, inside the University of Coimbra classrooms.

Measures: An anonymous self-report questionnaire was developed to assess (a) sociodemographic characteristics, (b) prevalence of seven HBA sets before and after entering university (these questionnaire items were developed based on existing assessment instruments, such as Health and Behaviour Survey; Grant, Wardle & Steptoe, 2009), (c) direction of possible changes in all HBA considered, taking into account the potential impact on students' health, (d) students' perception of the impact of these possible changes on their health, adaptation process and academic performance and students' desire about HBA changes, (e) subjects' perception of their actual general health condition and (f) academic performance (it was given by the weighted average of students' examination results of the first semester). The short form of another questionnaire (*QVA-r* or *Questionário de Vivências Académicas – versão reduzida*; Almeida, Soares & Ferreira, 2000) was used to measure personal, educational, social and vocational experiences considered to have strong repercussions on the quality of adaptation/adjustment to higher education. More details about these 2 questionnaires can be found elsewhere (Soares, Pereira & Canavarro, in press).

Data analysis: The data were analyzed using SPSS version 17.0. Statistical analyses used were descriptive statistics, paired Student's t-test and Spearman's rank correlation coefficient.

Results

Table 1 shows the prevalence of HBA before and after entering university and the sample distribution by the four categories of the variable "direction of possible changes in HBA": HBA positive change (PC), HBA negative change (NC), HBA positive non-change (PnC) and HBA negative non-change (NnC).

Table 1 – *Prevalence of HBA before and after entering university and sample distribution by "direction of possible changes in HBA" categories.*

HBA	Prevalence of HBA (N = 546)		Direction of possible changes in HBA (N = 546)	
	$M \pm SD$ (Min-Max) or % (n)			
	Before university	In university	% (n)	
Eating behaviour				
Meals (per day)	4.3 ± 0.8 (2-8)	4.1 ± 1.0 (2-12)	NnC 5.9 (32) PC 11.7 (64)	NC 17.8 (97) PnC 64.7 (353)
Nutritional quality of meals	Poor: 4.4 (24) Satisf: 24.9 (136) Good: 70.7 (386)	Poor: 13.2 (72) Satisf: 56.8 (310) Good: 30.0 (164)	NnC 3.5 (19) PC 48.0 (262)	NC 9.7 (53) PnC 38.8 (212)

HBA	Prevalence of HBA (N = 546)		Direction of possible changes in HBA (N = 546)	
	$M \pm SD$ (Min-Max) or % (n)			
	Before university	In university	% (n)	
Sleep-wake pattern				
Hours of sleep (per day)	8.1 ±1.2 (2-13)	7.0 ± 1.2 (1-12)	NnC 5.5 (30) PC 33.2 (181)	NC 33.0 (180) PnC 28.4 (155)
Quality of sleep	Poor: 2.2 (12) Satisf: 29.9 (163) Good: 67.9 (371)	Poor: 15.0 (82) Satisf: 54.0 (295) Good: 31.0 (169)	NnC 1.8 (10) PC 34.8 (190)	NC 13.2 (72) PnC 50.2 (274)
Physical/sports activity pattern				
Frequency of physical/ sports activity practice (per week)	Rare: 9.7 (53) Occas: 29.5 (161) Often: 60.8(332)	Rare: 39.9 (218) Occas: 37.4 (204) Often: 22.7 (124)	NnC 14.5 (79) PC 11.0 (60)	NC 62.8 (343) PnC 11.7 (64)
Psychoactive substances consumption				
Illicit drugs consumption	Never: 88.3 (482) Rare: 7.5 (41) Occas: 2.9 (16) Often: 1.3 (7)	Never: 88.6 (484) Rare 6.0 (33) Occas: 3.3 (18) Often: 2.0 (11)	NnC 8.1 (44) PC 0.5 (3)	NC 3.3 (18) PnC 88.1 (481)
Alcohol consumption (units per day)	0.3 ± 0.8 (0-5)	0.8 ± 1.4 (0-10)	NnC 1.1 (6) PC 16.3 (89)	NC 10.3 (56) PnC 72.3 (395)
Excessive alcohol (> 20g/ day) consumption (days per month)	1.3 ± 2.5 (0-25)	2.6 ± 4.0 (0-25)	NnC 14.3 (78) PC 1.5 (8)	NC 37.2 (203) PnC 47.1 (257)
Tobacco consumption (units per day)	1.1 ± 3.0 (0-25)	1.7 ± 3.9 (0-25)	NnC 6.8 (37) PC 0.5 (3)	NC 15.4 (84) PnC 77.3 (422)
Caffeine consumption (drinks per day)	0.8 ± 1.0 (0-8)	1.3 ± 1.3 (0-7)	NnC 2.4 (13) PC 30.8 (168)	NC 12.3 (67) PnC 54.6 (298)
Taking medication without professional advice				
Frequency of self-medication (per year)	Never: 34.2 (187) Rare: 47.1 (257) Occas: 16.1 (88) Often: 2.6 (14)	Never: 33.9 (185) Rare: 44.0 (240) Occas: 17.9 (98) Often: 4.2 (23)	NnC 16.7 (91) PC 1.3 (7)	NC 5.5 (30) PnC 76.6 (418)
Sexual behaviour				
Frequency of condom use (per sexual intercourse)	Abstin: 19.6 (107) Rare: 20.1 (110) Often: 12.5 (68) Always: 47.8 (261)	Abstin: 19.2 (105) Rare: 19.2 (105) Often: 12.3 (67) Always: 49.3 (269)	NnC* 28.6(156) PC* 2.4 (13)	NC* 2.9 (16) PnC* 66.1 (361)
Health monitoring				

HBA	Prevalence of HBA (N = 546)		Direction of possible changes in HBA (N = 546)	
	$M \pm SD$ (Min-Max) or % (n)			
	Before university	In university	% (n)	
Frequency of health monitoring (per year)	Never: 0.7 (4) Rare: 27.7 (151) Occas: 46.7 (255) Often: 24.9 (136)	Never: 0.5 (3) Rare: 34.4 (188) Occas: 42.1 (230) Often: 22.9 (125)	NnC 25.6 (140) PC 7.5 (41)	NC 9.4 (51) PnC 57.5 (314)
Lifestyle (general measure)	10.3 ± 1.6 (5-13)	9.1 ± 2.0 (0-13)		

* Answers were analysed according to whether or not students had sexual intercourse and multiple sexual partners.

Statistically significant ($p < .01$ or $p < .05$) differences between average values of each HBA and lifestyle, before and after entering university, were found (except for illicit drugs consumption), with students giving lower ratings after transition in eating behaviour, sleep-wake pattern, physical/sports activity pattern, health monitoring and lifestyle (general measure) and higher ratings in psychoactive substances consumption, self-medication and safe sexual behaviour.

As to freshmen's perception of the impact of these possible changes, students admitted that lifestyle alterations had a negative impact (n = 249, 45.6%) or no impact at all (n = 238, 43.6%) in their general health condition, no impact at all (n = 291, 53.3%) or a positive impact (n = 129, 23.6%) in their adaptation process and, at last, no impact at all (n = 268, 49.1%) or a negative impact (n = 212, 39.8%) in their academic performance. Only 36.8% of the respondents (n = 201) would like to change something in their lifestyle and almost half of them (n = 95, 47.2%) wanted to start or to increase physical/sports activity practice.

Table 2 presents information about sample's actual general health condition, academic performance and quality of the adaptation process.

Table 2 – *Descriptive statistics of actual general health condition and academic success*

Variables		% (n)		$M \pm SD$ (Min-Max)
Physical health condition (n = 544)		1=Bad 4.6 (25) 2=Fair 26.1 (142) 3=Good 41.0 (223)	4=Very good 22.8 (124) 5=Excellent 5.5 (30)	3.0 ± 1.0 (1.0-5.0)
Mental health condition (n = 544)		1=Bad 5.0 (27) 2=Fair 18.0 (98) 3=Good 30.5 (166)	4=Very good 31.4 (171) 5=Excellent 15.1 (82)	3.3 ± 1.1 (1.0-5.0)
Academic performance (n = 546)				10.7 ± 4.2 (0-18.5)
Quality of the adaptation process (n = 546)	Personal Social Vocational Learning Institutional			3.5 ± 0.8 (1.4-5.0) 3.8 ± 0.7 (1.2-5.0) 3.9 ± 0.7 (1.1-5.0) 3.2 ± 0.6 (1.5-4.9) 3.9 ± 0.6 (1.6-5.0)

Results of Spearman's coefficient calculation revealed statistically significant (p <.01 and p <.05) associations (which varied from low to moderate strength) between lifestyle (its general measure and some of HBA considered) and actual general health condition or academic success indicators. Here is some relevant data: (a) the general measure of lifestyle was positively associated with physical health condition (ρ = .25, p <.01), mental health condition (ρ = .23, p <.01), academic performance (ρ = .26, p <.01) and personal (ρ = .25, p <.01), learning (ρ = .25, p <.01) and vocational (ρ = .12, p <.01) experiences; (b) the quality of sleep was positively related with all indicators of actual general health condition and academic success ($.13 \leq \rho \leq .36$, p <.01), (c) the practice of physical/sports activity was positively associated physical health condition perception (ρ = .30, p <.01), (d) the consumption of excessive alcohol was negatively associated with learning experiences (ρ = -.13, p <.01) and academic performance (ρ = -.10, p <.05), but positively related with social experience (ρ = .18, p <.01); and (e) the consumption of tobacco was negatively associated with academic performance (ρ = -.25, p <.01), learning experience (ρ = -.17, p <.01) and mental health condition (ρ = -.13, p <.01).

Conclusions & Discussion

Although the prevalence of HBA has changed (probably, as consequence of the adaptation process to multiple changes and challenges) and lifestyle global measure has decreased with transition to higher education, most of the students have changed to or maintained a healthy lifestyle, except for excessive alcohol consumption and physical/sports activity practice. Despite the considerable number of students who felt a negative impact of those lifestyle alterations on their general health condition and academic performance, only a few would like to change something, such as (to start or to increase) physical/sports activity practice. This discrepancy may be due to: (1) perceived invulnerability to diseases in young adults (more than 69% of the sample classified its general health condition as good, very good or excellent), (2) existence of benefits (e.g., sense of belonging increasing) in expressing negative HBA such as psychoactive substances use or sleep deprivation required by academic parties (in this study, the consumption of excessive alcohol was results positively related with social experience) and (3) the complex mechanisms involved in intention (to change HBA) formation, as explained by several theoretical models. Students' choice of physical/sports activity practice wasn't surprising given (1) the large percentage of practitioners (77.3%) that changed for (or remained in) insufficient levels of practice and (2) the growing demand for physical/sports activity programs (a new social phenomenon) owing to several reasons (aesthetic, performance, health-related, etc.).

Most of the associations found between lifestyle and general health condition or academic success indicators are consistent with the literature: in general, healthier lifestyles (with more positive HBA) provide higher levels of perceived general health condition and academic performance and vice versa. However, in this sample, the practice of physical/sports activity seems to play an important role in physical health condition, which is no extensible to academic performance (probably due to time management difficulties), as well as the excessive alcohol use seems to be relevant in social experiences quality (and vice versa), despite collateral damage. These results provide important information for planning an intervention project to promote health and academic success in higher education specific

context: work out the meaning of some negative HBA and take into consideration sample's intention about HBA changes.

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Chapter 15

Characteristics and consequences of temporal orientation for psychological well-being: Learning from the past, fearing the future and living for today

James M. Jones
Jordan B. Leitner
Charlotte Marshall
Yiming Jing
Jeong Min Lee
University of Delaware, USA
jmjones@psych.udel.edu

Abstract: Typically, past orientation predicts negative psychological outcomes and future orientation predicts positive psychological outcomes. However, orienting to the past need not always produce negative psychological outcomes. When the past is viewed from a positive hedonic frame, or a frame that lays a foundation of self-knowledge, self-awareness and collective belonging and pride, positive associations with the self are made. Conversely, if one's future focus is based in fear and worry, concern with a lack of control, then the psychological impact in the present may be much less positive. Study 1 demonstrated that Past-Self-Knowledge is positively, and Future-Worry is negatively related to psychological well being. Study 2 showed that death salience disrupted patterns of future and past time travel drawing people more closely to the present.

Keywords: temporal orientation, psychological well-being, terror management theory.

Introduction

The capacity for reflexive thought allows a person to consider his or her life over time. A person is defined by past experiences and how they are remembered, felt and interpreted, as well as expectations for the future and how vividly they influence ongoing judgments. Lewin's (1947) field theoretic approach held that the life span consisted of recollections of the past as well as visions of the future and that each was simultaneously accessible in the present. The self, then, is an integration of one's past and visions of the future in the present.

We regard temporal orientation as the tendency to focus attention on and react to the past, present, and future. Generally, we focus attention on the content and possible behaviors that convey positive feelings, and avoid those that are negative. Whether projecting oneself forward by considering possible selves or engaging in a life review, or engaging in expressive or defining behaviors from day to day, temporal regions are characterized by the image of the self found therein.

Research has generally shown that a past orientation or bias is associated with negative psychological outcomes and processes that precipitate and sustain them. Conversely,

future orientation is associated with positive psychological outcomes like optimism, self-esteem, conscientiousness and processes that sustain them like impulse control, goal setting (Holman & Silver, 1998; Zimbardo & Boyd, 1999; Jones, Banisky & Lasana, 2002).

However, orienting to the past need not always produce negative psychological outcomes. When people view the past from a positive hedonic frame, they tend to have higher self-esteem, lower anxiety, and depression, and are more energetic and friendly (Zimbardo & Boyd, 1999). Conversely, future focus need not always leads to positive outcomes. If one's future focus is based in fear and worry, concern with a lack of control, then the psychological impact in the present may be much less positive.

Finally, the hedonic basis for a positive view of the past may be compared to a self-knowledge basis of a past focus. In the latter case, a past orientation lays a foundation of self-awareness and collective belonging and pride. This Past-Self-Knowledge view may also lead to positive psychological outcomes but may follow a different pathway.

The present studies assess these two new facets of past and future orientation. Study 1 tests the possibility that Future-Worry and Past-Self-Knowledge reverse the conventional relationships with psychological well-being found in the literature. Study 2 differentiates them from general measures of Past and Future orientation by manipulating mortality salience (Greenberg et al., 1990) as a means of foreshortening the future. We expect that mental or emotional "time-travel" (Arnold, McDermott & Szpunar, 2011) will be truncated by this manipulation, but that the effects of Future-Worry and Past-Self-Knowledge will be largely unaffected. In fact, Future-worriers may actually be more prone to a future focus since mortality salience confirms the legitimacy of their worry.

Study 1

Method

Ninety four introductory psychology students participated in exchange for partial course credit. Participants reported their Past, Present, and Future orientations on a conventional measure of temporal orientation (Jones et al., 2002). To assess Past-Self-Knowledge, participants responded to the Past-Self-Knowledge Scale, a 5-item scale that measures the degree to which one's past informs one's present and future (e.g., "To understand the present, I have to know the past"), on a (*Agree Strongly*) to 7 (*Disagree Strongly*) scale, α=.78. Next, participants completed the Future-Worry Scale, a 5-item scale that measures the degree to which one worries about the future ("I often worry about what will happen to me in the future"), on a 1 (*Agree Strongly*) to 7 (*Disagree Strongly*) scale, α=.87. Finally, participants completed the autonomy, environmental mastery, and self-acceptance dimensions of the Psychological Well-being Scale (Ryff & Keyes, 1995), and self-esteem (Rosenberg, 1965), optimism (Scheier, Carver & Bridges, 1994), satisfaction with life (Diener, Emmons, Larsen, & Griffin, 1985), and affect scales (Watson & Clark, 1994).

Results and Discussion

As shown in Table 1, Past orientation was unrelated to Present and Future orientation. However, Past-Self-Knowledge was positively related to Past, Present, and Future

orientations, suggesting that greater Past-Self-Knowledge provides greater access to all temporal periods. Additionally, Future-Worry was unrelated to Future orientation.

Past orientation corresponded with lower PWB, and Future orientation corresponded with greater PWB. However, as hypothesized, Past-Self-Knowledge predicted greater PWB, and Future- Worry predicted diminished PWB.

Table 1 – *Correlation coefficients*

	TOS Past	TOS Pres	TOS Fut	Past-Self-Know	Fut-Wor	Self-Est	Opt	Auto-nomy	Eniv. Mast.	Self-Acc.	Pos. Aff.	Neg. Aff.	SWL
TOS Past	1	.07	.09	.41**	.54**	-.46**	-.39**	-.15	-.25*	-.19†	-.22*	.32**	-.31**
TOS Pres		1	-.00	.30**	-.01	.19†	.26*	.11	0.15	.31**	.19†	-.19†	.17
TOS Fut			1	.25*	.16	.26*	.28**	.11	.37**	.21*	.38**	-.08	.23*
Past-Self-Know				1	.20†	.05	.10	.03	.08	.20†	.38**	-.20†	.19†
Fut-Wor					1	-.37**	-.40**	-.24*	-.24*	-.16	-.22*	.16	-.08

† $p<.10$ *$p<.05$ **$p<.01$

Study 1 thus demonstrated the viability of the Past-Self-Knowledge and Future-Worry as extensions of traditional models of temporal orientation. Correlations suggest that integrating the past into the present and future is beneficial for mental health, while excessive worrying about future events diminishes mental health. Study 2 extended these findings to test whether mortality salience moderates temporal orientation's relationships with mental "time-travel".

Study 2

Method

One-hundred eighty six introductory psychology students participated in an online one-way design (mortality salience vs. control) in exchange for partial course credit. First, participants completed all of the temporal orientation measures from Study 1. Participants then described the thoughts and emotions that death (or dental pain) evokes, and what they think will happen as they experience death (or dental pain). Next, to determine whether mortality salience affects the ability to mentally access the past, participants described their five most memorable memories. We operationalized memory elaboration as the total number of words participants used to describe their memories. Finally, participants described five goals for the future. To determine whether mortality salience affects the ability to access the future, participants indicated for each goal whether they agreed that they had "thought carefully about attaining this goal" on a 1 (*Disagree Strongly*) to 7 (*Agree Strongly*) scale.

Results and Discussion

To test whether mortality salience truncates one's ability to access the past, and whether this tendency is moderated by Past orientation, we regressed the total number of memory description words on condition (0=control; 1=mortality salience), centered Past orientation, and the interaction in a regression model. The interaction was significant, b=-33.92, SE=10.70, p=002. Simple slope analyses revealed that greater Past orientation predicted greater memory elaboration in the control condition, b=70.91, SE=21.97, p<.001. In the mortality salience condition, however, Past orientation was unrelated to memory elaboration, suggesting that mortality salience limits "time-travel" to the past. Past Self-Knowledge was unrelated to memory elaboration in both experimental conditions.

To test whether mortality salience truncations one's ability to access the future, and whether this relationship is further moderated by Future orientation, we regressed goal concern on condition, centered Future orientation, and the interaction in a linear regression model. The interaction was significant, b=.46, SE=.22, p=.04. Simple slope analyses revealed that greater Future orientation predicted greater goal concern in the control condition, b=.10, SE=.36, p<.01. In the mortality salience condition, however, Future orientation was unrelated to goal concern. Future-Worry was unrelated to goal concern in both experimental conditions.

General Discussion

These studies demonstrate the dual effects of cognitive and affective processes on the temporal dimensions of the self. The consequences of focusing on the past or future depend on the affective orientation one holds. Past focus has negative effects on current psychological well-being if it is based in negative affect, but not if it is based in a constructive and valued view of the contemporary self. Conversely, future focus contributes positively to psychological well being when desired outcomes are expected and more confidently anticipated, but negatively when worry is the dominating affect with which the future is considered.

In our studies, death salience curtails time travel in both directions (past and future), but only for people who are respectively past and future oriented. Death salience disrupts well learned patterns of thinking about and reacting to the past or future. Past Self-Knowledge and Future-worry were unrelated to memory elaboration and goal concern, respectively, suggesting that these dimensions do not predict the frequency with which one cognizes about the past and future. Rather, these aspects of temporal orientation may determine whether past and future thoughts are integrated into the current self. These aspects of temporal orientation suggest the need for a more elaborate view of how focusing on temporal regions is influenced by the interaction of cognitive and affective factors.

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Chapter 16

Action planning fosters adoption of regular physical activity behavior among low-control individuals with high intention

Pier-Eric Chamberland
Paule Miquelon
University of Quebec, Canada
pier.e.chamberland@gmail.com

Abstract: This study aims to document how action planning (AcP) and coping planning (CP) (Gollwitzer, 1999) combines with the intention and perceived behavioral control (PBC) variables (Ajzen, 1991) to predict physical activity (PA) behavior. It was hypothesized that: 1) intention and the use of planning would each have a main effect on PA behavior, 2) AcP, with or without CP, would be useful to individuals with low PBC if their intention was high. In a quasi-experimental prospective design, 122 individuals were asked to engage regularly in PA for the 5 following weeks with the help of AcP alone, AcP and CP, or no planning at all. TPB variables and past month PA behavior were measured at T1 and frequency of PA was measured at T2. Results of an ANCOVA 2 (low vs high intention) X 3 (no planning, AcP, AcP + CP) X 3 (low, average or high PBC), which controlled for the influence of past behavior, revealed a main effect of intention and a significant interaction between intention, planning and PBC. Simple effects analysis demonstrated that AcP alone improved PA frequency among low PBC individuals with high intention. Limits of the design as well as conceptual implications are discussed.

Keywords: physical activity, action and coping planning, intention, perceived behavioral control.

Background

Optimal functioning and self-regulation of goals, including health goals like regular physical activity (PA), are ideally attained through future-oriented and eudaemonic mindsets (Miquelon & Vallerand, 2008; Oettingen, 2000; Zimbardo & Boyd, 1999). Goal setting and planning (or implementation intentions, IIs, Gollwitzer, 1999) are integral parts of these processes (Gollwitzer & Oettingen, 2011) and planning can even compensate for the goal striving deficits associated with a limited time perspective (Gellert et al., 2012). Concurrently, research by Bayer, Gollwitzen & Achtzigen (2010) suggested that IIs also contribute to acquire a concrete and present-centered mindset called hypo-egoic self-regulation, in which conscious thoughts conflicting with execution of action (i.e. self-defeating emotions or temptations) are silenced, thus fostering flow experience and reducing self-regulatory expenditure (Leary & Guadagno, 2011). Effective goal intentions and planning go hand in hand (Mele, 2009), as intention alone appears to be insufficient to foster behavior change (intention-behavior gap, Sheeran, 2002). Indeed, IIs were shown to be significant intention-PA mediators, induced IIs having small to medium effect sizes

(Bélanger-Gravel et al., 2011; Carraro & Gaudreau, 2012) and spontaneous IIs having medium to large effect sizes (Carro & Gaudreau, 2012). Both subtypes, action planning (AcP, specifying where, when & how to exercise) and coping planning (CP, identifying obstacles to exercise and the means to overcome them, Sniehotta et al., 2005), have been used with success, separately or in combination, within interventions to increase PA (Carraro & Gaudreau, 2012).

Purpose and hypotheses

To our knowledge, the benefits of AcP combined with CP have never been compared to those obtained with AcP alone. Also, few studies focused on differential effects of AcP and CP on different profiles of exercisers. For example, since perceived behavioral control (PBC) has its own main effect on PA behavior (Ajzen, 1991), some people have the intention to exercise regularly but lack the confidence in succeeding to do so over a long period of time. Concurrently, past experience facilitates enactment of behavior (Ajzen, 2002) and is likely to impact positively on PBC. For these reasons, we aimed to investigate the possibly increased benefits of combining AcP and CP, and the potential of AcP, with or without CP, to help people with limited PA experience increase their practice of PA. In brief, we expected past behavior, intention and planning to have a main effect on PA behavior, as well as a three-way interaction between PBC, intention and planning. We also hypothesized that AcP, with or without CP, would be useful to individuals with low PBC if their intention was high.

Method

In order to verify these hypotheses, we used a prospective quasi-experimental design with IIs being experimentally manipulated. Two waves of data were collected from a sample of 140 French-Canadian adults (109 women & 31 men, mean age: 31.5 years, S.-E. = 1.0 years) recruited through newspaper ads and on-the-spot solicitation at the Center for sports and PA of University of Québec at Trois-Rivières. Participants were required to present no pre-existing condition that might hinder the practice of PA and not already be regular exercisers (practicing PA less than 3 times a week). They were also invited to engage in moderate PA for at least 30 minutes, three days per week, over the following five weeks. The survey protocol consisted of two web-based questionnaires (pre and post-test), filled in an interval of 4 to 5 weeks.

The first questionnaire (T1) contained scales measuring past and current moderate PA frequency (adapted from Godin & Shephard, 1997), intention and PBC toward PA (3 and 6 items, Boudreau & Godin, 2009). At the end of this questionnaire, each participant was randomly assigned to one of the following conditions: a) a control group with no induced planning, b) a group forming AcP only and c) a group forming both AcP and CP. Adopting Sniehotta and colleagues (2005)' procedure, participants forming AcP were instructed to write down where, when and how they intended to practice PA over the following five weeks, while those forming both AcP and CP were also asked to list what obstacles where most likely to hinder their PA goals over that time and what means they chose to overcome

them efficiently. Participants in the control group were not asked any questions about planning. The second questionnaire (T2) measured the weekly frequency of PA over the last five weeks on a 7-point Likert Scale (adapted from Godin & Shephard, 1997). An analysis of covariance (ANCOVA) 2 (low vs. high intention) X 2 (low vs. high PBC) X 3 (conditions a, b, and c), controlling for the effect of past PA frequency, was used to analyze the data, as well as planned contrasts and pairwise comparisons with Bonferroni correction to identify significant differences. The median was used as a cut-off point to create upper and lower intention and PBC categories.

Results

Table 1 – *Effects of past PA, intention, PBC and planning on PA frequency at T2*

Source	df	Type 1 SS	MS	F	*p*	η^2
Past PA frequency	1	8,307	8,307	6,154	,014	,046
Intention	1	9,562	9,562	7,084	,009	,053
PBC	1	3,745	3,745	2,774	,098	,021
Condition	2	5,606	2,803	2,077	,130	,032
Condition*intention	2	,784	,392	,291	,748	,005
Condition*PBC	2	,163	,081	,060	,942	,001
Cond.*intention*PBC	3	13,867	4,622	3,424	,019	,075
Error	127	171,429	1,350			
Total	140	823,739				
Corrected Total	139	213,463				

Planned contrasts revealed a significant difference between control and experimental groups, $F(1, 127)= 8.72$, $p = .004$, but not between experimental groups ($p = .31$). Results of the ANCOVA are presented in Table 1. Past PA frequency and intention had significant effects on PA frequency at T2 ($p =.014$ and $p =.009$). Although no effects were found for PBC and the experimental conditions ($p > .05$), an interaction between intention, PBC and the experimental conditions was found ($p = .019$). Pairwise comparisons indicated that the significant contrast was between AcP and the control group for participants included in the high intention and low PBC categories. More precisely, AcP users showed higher PA frequency than the control group ($p = .021$). The difference between the group using both AcP and CP and the control group was not significant. Also, among low-PBC AcP users, participants in the high intention category showed higher PA frequency than participants in the low intention category ($p = .022$). Interestingly, participants with low intention and high PCB using AcP showed higher PA frequency than those who did not, but that difference was only marginally significant ($p =.056$).

Discussion and conclusion

Our first hypothesis was partially supported, since only past frequency of PA and intention had main effects on PA frequency at T2. No main effects were found for PBC and the experimental conditions but the two variables interacted with intention altogether. The experimental conditions' effect size suggests that increasing sample size would help reach significance in future research. By contrast, our second hypothesis was supported: AcP combined with high intention improved PA frequency in individuals with low PBC. Small sample size might be responsible for the lack of significant differences between the group using AcP only and the group using AcP combined with CP. Nevertheless, the group using both AcP and CP had the highest increase in PA frequency between T1 and T2 in the sample, although it was not significant compared to other groups. A complementary effect of CP might have emerged over a longer time period, once the behavior was installed through AcP.

Overall, these findings are consistent with the intention-behavior mediation found by Conner et al. (2010), which revealed that planning is more efficient when intentions to exercise are strong. They also contrast with findings of Luszczynska and Haynes (2009), which reported that self-efficacy must be sufficiently high for the plans to work. Self-efficacy and PBC being conceptually distinct, this could raise the question of whether planning boosted self-efficacy in people with low PBC. The marginally significant difference between AcP users and control group for low-intention-high PBC profiles suggests that the effect of plans may not be limited to the intentional stage (Carraro & Gaudreau, 2012). Further research is necessary to document the effect of provided planning in pre-intentional stages.

In sum, AcP seems to have a beneficial effect on PA behavior for individuals who have low confidence in their ability, but this is conditional to intention: volition is still necessary. Results suggest that first-timers can concentrate on getting started with AcP before considering CP, which should be more useful in maintenance (Scholz et al., 2008). In addition to the formulation stage-appropriate specific plans, they also highlight the importance of sustaining volition over time, hence self-regulatory effort, as proposed by Hall, Fong & Cheng (2011), and Hagger et al. (2010).

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Chapter 17

The relationship between time perspective and death attitude in women patients with type II diabetes

Masoumeh Nozari
Yarali Dousti
Roya Raoufi Ahmad
Islamic Azad University, Sari Branch, Iran
roya.nozari@gmail.com
raoufi.rar1973@yahoo.com

Abstract: Time perspective helps to give order and meaning to events, and is also used in encoding, storing and recalling experienced events. The aim of the study was to investigate the relationship between time perspective and death attitude in diabetic women patients. In a cross-sectional design study, 100 outpatients were selected by sampling at hand. Data were collected through two questionnaires including (ZTPI-56) and (DAPR-32). Results revealed a significant positive correlation between different time perspectives and death attitudes. Past-Positive orientation is connected with the view of death as a natural phenomenon and approach acceptance. Past-Negative orientation is connected with the escape acceptance, and also with fear of death and avoidance. Present-Hedonistic orientation is connected with escape and avoidance. Present-Fatalistic orientation is connected with natural acceptance. Future orientation is connected with the view of approach and avoidance. According to these findings, diabetic women patients with past-negative and present-fatalistic orientations have a more negative view of death.

Keywords: time perspective, death attitude, patients with type II diabetes.

Introduction

Time perspective (TP) is used in encoding, storing, and recalling experiences; in sensing, feeling, and being; and in shaping expectations, goals, contingencies and in imagining scenarios. Zimbardo & Boyd (2008) believe that time perspective is often a non-conscious personal attitude that each of us holds toward time and the process whereby the continual flow of existence is bundled into time categories that help to give order, coherence, and meaning to our lives. For example, our thoughts about the past, the present, and the future may be positive or negative, happy or sad, hopeful or fearful.

Many basic psychological processes rely on some aspect of time, such as habituation, conditioning, memory, reinforcement contingencies, self-efficacy, anticipation, violation of expectation, evolutionary adaptive, guilt, depression and anxiety, to name but a few. Even fundamental distinctions between cognition and emotions are reconcilable within the framework provided by a temporally-based theory in which emotions are cast as being evolutionarily more primal for immediate responding, whereas cognitions are cast as later

adaptations for planning and reflective responding (Zimbardo & Boyd, 1999). Cognitive processes involve reconstructing the past and constructing the future, thus influencing current decision making and behavior. One's beliefs about negative past experiences and a life path predestined and uninfluenced by individual actions have been positively associated with depression and trait anxiety, and negatively associated with self-esteem. A present-time perspective has been positively related to risk-taking behaviors and substance use (Anagnostopoulos & Griva, 2012).

Results of research showed the predicting role of TP in preventing healthy & unhealthy behaviors (Fieulaine & Martinez, 2009; Zambianchi & Ricci Bitti, 2008; Zambianchi, Ricci Bitti & Paola, 2010). Both approach and avoiding motivations increase as the future goal/event is approached in time and it influences the performance level of pupils differently (Bjornebekk & Gjesme, 2009). But if a certain time perspective starts to dominate an individual's view of time to the extent that it excludes or minimizes the others, it may become dysfunctional. In an optimally balanced time perspective, the past, present and future components blend and flexibly engage, depending on a situation's demands and our needs and values (Osin, Boniwell, Iwley & Ivanchenko, 2009).

The threat of death is the most fundamental and important source of adaptive and maladaptive psychological structures like high and low self-esteem (Mohammadi, Ghorbani & Abdollahi, 2010). As an existential crisis, death anxiety may create suffering and impact quality of life (Sherman, Norman & Mcshenny, 2010).

Continuous exposure to death can have adverse effects on physical health and mental well-being. Some of the effects found to be associated with higher levels of death anxiety include general anxiety, depression, discrepancy between self and ideal self, negative self-attitude, and neuroticism (Harrawood, White & Benshoff, 2008-2009). Studies suggest that although illness alone may arouse death concerns in some people, the degree of death anxiety triggered by deteriorating health is a function of both interpersonal factors (social support) and personal resource (coping styles and religious beliefs), rather than illness per se (Neimeyer, Wittkawski & Mosen, 2004).

Studies showed that an improvement in perception of the meaningfulness of life in four categories: expanded viewpoint; sadness about death; treating life sincerely; and instilling hope in life, was associated with interaction and self-reflection (Hwang, Chen & Lin, 2005). Future time perspective associated with it leads to a positive outlook on death (Neimeyer et al., 2004).

The researchers in this study investigated the relationship between time perspective and death attitude profile in women patients with diabetes type II.

Method

In a cross-sectional design study, 100 female outpatients with diabetes type II from Imam Hospital clinics in Sari/Iran, were selected by sampling at hand (2011-2012). Data were collected through two questionnaires including the Zimbardo Time Perspective Inventory (ZTPI-56) and Death Attitude Profile-Revised (DAPR). Half of the cases filled in the Time Perspective Inventory first and Death Attitude Profile-Revised next, and the other half did the reverse. Ages ranged from 18-78 years (M=48.21, SD= 12.01).

Measures

Time Perspective Inventory (ZTPI). The Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999) is a 56-item measure consisting of five subscales, each including 9–15 items. Participants respond to statements using a 5-point Likert scale (1=very uncharacteristic; 5=very characteristic). Its developer reported internal consistency estimates for subscale scores based on Cronbach's alpha coefficients ranging from .74 to .82. Test–retest reliabilities (over a 4-week period) of the five subscales ranged from .70 to .80.

Death Attitude Profile-Revised (DAPR). The death attitude profile-revised inventory is a 32-item measure consisting of five subscales (Fear, Avoidance, Neutral Acceptance, Approach, and Escape Acceptance). Participants respond to statements using a 7-point Likert scale. Its developer reported internal consistency estimates for subscale scores based on Cronbach's alpha coefficients ranging from 0.65 to 0.97.

Results

Correlation coefficients showed a significant positive correlation between different time perspectives and death attitudes. Past-Positive orientation is connected with the view of death as a natural acceptance and approach acceptance. Past-Negative orientation is connected with escape acceptance, also fear of death and avoidance. Present-Hedonistic orientation has a positive correlation with escape and avoidance acceptance. Present-Fatalistic orientation is connected with natural acceptance. In addition, Future orientation is connected with the view of approach and avoidance acceptance (Table 1).

Discussion

The findings showed that there is a positive and significant relation between fear of death and escape acceptance and death avoidance components with past-negative (PN) time perspective. Studies showed that negative perception of the past reflects an unhappy view toward the past and it is associated with depression, trait anxiety and self-reported unhappiness (Zimbardo & Boyd, 1999; Anagnostopoulos & Griva, 2012). In additional, higher levels of depression and anxiety were also predicted by PN in individuals diagnosed with chronic diseases such as diabetes (Anagnostopoulos & Griva, 2012). Death is feared for different reasons. The loss of self, the unknown beyond death, pain and suffering, lost opportunity for atonement and salvation are just some of the sources of fear of death (Neimeyer, 1994).

Based on the findings of different studies, it is assumed that negative obsessive rumination with past memories leads to activating negative attitudes toward death.

Positive Past (PP) showed positive correlations with natural and approach acceptance. In natural acceptance, a person believes that death as a reality is neither feared nor welcomed. Whereas in approach acceptance, a person believes in death as a gateway to a happy life hereafter (Neimeyer, 1994). So, this finding supported studies which showed PP as related to a strong sense of self-esteem and happiness, and low levels of depression and anxiety

(Anagnostopoulos & Griva, 2012). Present-Hedonistic (PH) showed positive correlations with escape and avoidance acceptance. In escape acceptance, a person confronts death as an escape from a physical and psychological pain. When life is full of pain and misery, death may be a welcome alternative. It has been suggested that the fear of living under certain conditions may be stronger than the fear of death (Neimeyer, 1994). A person with a death avoidance view avoids thinking or talking about death in order to reduce death anxiety. In the present samples it seems to be replaced by a defensive response to internal problems.

Table 1 – *Relationship between time perspective and death attitude profile*

Time Perspective		Fear of death	Escape acceptance	Natural acceptance	Approach acceptance	Death avoidance
Past-Negative	Pearson Correlation	.399**	.259*	.120	-.010	.221*
	Sig. (2-tailed)	.000	.011	.243	.922	.030
Past-Positive	Pearson Correlation	.043	.052	.252*	.210*	-.081
	Sig. (2-tailed)	.678	.618	.013	.041	.435
Present-Hedonistic	Pearson Correlation	.152	.219*	.106	.162	.246*
	Sig. (2-tailed)	.139	.032	.306	.116	.016
Present-Fatalistic	Pearson Correlation	.100	.088	.216*	.092	.151
	Sig. (2-tailed)	.333	.394	.035	.376	.142
Future Orientation	Pearson Correlation	.156	.214*	.191	.295**	.025
	Sig. (2-tailed)	.129	.036	.062	.004	.811

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Present-Fatalistic (PF) showed positive correlations with natural acceptance. PF reveals a belief that the future is predestined and uninfluenced by individual actions, whereas the present must be borne with resignation because humans are at the whimsical mercy of "fate" (Zimbardo & Boyd, 1999). Natural acceptance refers to a view of death as a reality that is neither feared nor welcomed (Neimeyer, 1994). Perhaps the reason for this attitude in the sample is that they accept death as a part of their fate.

Future orientation (F) showed positive correlations with escape and approach acceptance. F is associated with internal control, planning and a striving for goals and rewards (Kolesovs, 2002; Anagnostopoulo & Griva, 2011). Future time perspective is associated with it, and leads to a positive outlook on death (Neimeyer et al., 2004). These studies support the relationship between F and approach acceptance but, quite contrary to previous studies, a positive relation with escape acceptance. Escape acceptance reflects a negative view toward life and a positive view toward death. The researcher can conclude that if a certain time perspective starts to dominate an individual's view of time to the extent that it excludes or minimize the others, it may become dysfunctional (Osin et al., 2009).

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PART 4

THE ROLE PALYED BY TIME PERSPECTIVE IN CAREER AND VOCATIONAL DEVELOPMENT

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Chapter 18

The role of future time perspective in career decision making

Terrance L. Walker
Terence J. G. Tracey
Arizona State University, USA

Abstract: The present study of two hundred and seven university students examined the structural relation of future-orientation (both valence and instrumentality), career decision-making self-efficacy and career indecision (choice/commitment anxiety and lack of readiness) in a sample of 218 college students. Future time perspective was viewed as a key input to career decision making. Structural equation modeling results indicated that valence was not significantly related to career decision-making self-efficacy, choice/commitment anxiety and lack of readiness. However, instrumentality completely mediated the relation between valence and career decision-making self-efficacy, choice/commitment anxiety and lack of readiness. Instrumentality was significantly related to career decision-making self-efficacy and lack of readiness. Career decision-making self-efficacy completely mediated the relation between instrumentality and choice/commitment anxiety; however, it only partially mediated the relation between instrumentality and lack of readiness. Although the proposed model was invariant across gender, the findings indicated that women reported higher instrumentality and lower lack of readiness than did men. No differences were found for career decision-making self-efficacy and choice/commitment anxiety across gender. The findings suggest that psychologists, counselors, and teachers should consider the role future time perspective in university students' career development.

Keywords: future time perspective, valence, instrumentality, career decision-making self-efficacy, career indecision.

Introdution

Time perspective has been defined as an individual's ability to move into the past through the use of memory and/or to imagine the future (Savickas, 1991). Future time perspective, in particular, has been conceptually understood as the individuals' mental representation of the future. Two important aspects of future time perspective that have been found to be of particular relevance are *valence and perceived Instrumentality*. Valence has been described as the importance individuals attribute or place on goals that can attained in the future. According to De Volder and Lens (1982), present tasks or responsibilities students have are also important components of future time perspective because they lead directly to future goals. These present-oriented tasks are conceptualized as having perceived instrumentality.

Super (1980) first introduced his concept of planfulness. Savickas, Silling & Schwartz (1984) also indicated that future orientation and planning attitudes relate to career choice readiness. Similar to Super and Savickas and colleagues, we proposed that the orientation and continuity components of future time perspective will be associated with career

decision-making. Career decision self-efficacy is defined as having confidence to make decisions based upon one's self-concept, goals, and career options. The career decision process can be difficult and career indecision can result (Brown et al., 2012). Crites (1978) and Savickas, Silling and Schwartz (1984) posit that people's inability to think in terms of time perspective – unable to look beyond immediate tasks and obstacles- is a good indicator of level of career indecision.

Brown et al. (2012) have demonstrated that career indecision is not a unidimensional construct. They demonstrated that there are four relatively independent dimensions of career indecision but we thought that only the choice/commitment anxiety and lack of readiness dimensions were the most appropriate criteria of career indecision relative to future time perspective. The former describes one's inability to commit to a decision to due to having a multiplicity of available options or to not having a sufficient amount of information that would permit one to make a confident decision, and the latter is refers to a genuine lack of planfulness and goal directedness. As such, we hypothesized that individuals who understand the importance of future goals and present-task behaviors would experience less anxiety about the career choices, and would also be better prepared to make informed decisions. (See Figure 1 for complete model).

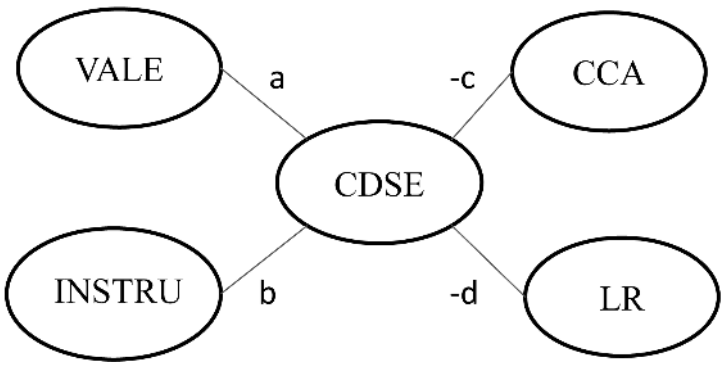

Figure1. Presentation of hypothesized model of relations between (VALE) and instrumentality (INSTRU), and career decision-making self-efficacy (CDSE) and choice/commitment anxiety (CCA) and lack of readiness (LR). (-) Signifies an inverse relation between the variables.

Method

Participants

The sample was comprised of 218 university students enrolled at Arizona State University. Of the total sample, 107 (49%) were women (mean age 19.55, SD=1.40) and 111 (51%) were men (mean age 19.70, SD=2.10). There were 136 (62.4%) White, 37 (17%) Hispanic, 15 (6.9%) African American, 13 (6%) Asian American/Pacific Islander, and 17 (7.8%) Multi-racial students. There were 59 (27.1%) Freshmen, 61 (28%) Sophomores, 67 (30.7%) Juniors, and 31 (14.2%) Seniors.

Measures

Sociodemographic. This questionnaire gathered an array of demographic data, which included ethnicity, age, sex, and GPA.

Future Time Perspective (FTS, Shell, 1985; Measure only available in Shell & Husman, 2001). The FTS assessed the extent to individuals are future-oriented. Valence (7 items) and Instrumentality (12 items) were used as they were the most salient in the present study. For both subscales, participants were asked to indicate their agreement with each question using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) and responses were summed to yield total subscale scores. In the present study, the internal consistencies for the valence and instrumentality subscales were α's of .69 and .84, respectively.

Career Decision Self-Efficacy. The short form of the CDSE scale (Betz, Klein, & Taylor, 1996) was designed to measure the most important aspect of students' beliefs regarding career decision making. The measure consists of 25 questions and asks students to rate their confidence in their current ability to complete a task. Higher scores indicated more decision-making efficacy. The scale is widely used as a unidimensional test and has been found to be highly reliable and to have sufficient evidence for validity (Betz et al., 1996). Betz et al. (1996) internal reliability coefficients for the total scores of α =.94 and .93, respectively. The internal reliability for the current study was .92.

Career Indecision Profile (CIP; Brown et al., 2012). The CIP is a 65-item scale used to assess career indecision. The scale consists of the four subscales with responses rated on a 6-point Likert-type scale ranging from 1 (*completely disagree*) to 6 (*strongly agree*). For purposes of the current study, only the choice/commitment anxiety and lack of readiness subscales were used. Higher scores indicated more insecurity and anxiety, and more unpreparedness when making occupational choices. For the current sample, we found internal consistency estimates of α = .96 and .92, for choice/commitment anxiety and lack of readiness respectively.

Procedures

Data were collected using hardcopy and online forms of the questionnaire that took approximately 15 minutes to complete. The career development class draws individuals from all majors across campus and is one of the most diverse courses with respect to interest distribution. Two hundred and eighteen (87%) of the 250 students we invited to participate in the study completed the questionnaire. Of the total sample, 161 (74%) of the students completed the survey in class while and 57 (26%) participants completed the questionnaire online. There was only 5% (11 people) who did not complete all of the data. Given the low number we used listwise deletion.

Analyses

Structural equation modeling was used to test both the relational and mediational effects of future time perspective and career decision-making self-efficacy and career indecision (i.e., anxiety/commitment and lack of readiness). Analysis of the proposed model followed the two-step procedure (see Anderson and Gerbing (1988)).

The maximum-likelihood (ML) estimation method was utilized in order to examine the fit of the model. According to Quintana and Maxwell (1999), the ML procedures are widely used because they are more robust to situations where the distribution departs from normality. To assess for model fit we used several fit indices including the chi-square, comparative fit index (CFI), root-mean-square error of approximation (RMSEA), standardized root-mean-square residual (SRMR) (Hu & Bentler, 1999). In order to test whether the hypothesized model was superior to other competing models, we followed Hoyle and Panter's (1995) recommendations by performing several comparisons between pairs of tested models with chi-square difference tests. To test the magnitude and significance of mediation effects, we followed Shrout and Bolger's (2002) suggestion to use the bootstrapping procedure.

Results

Confirmatory factor analysis (CFA) was used to test the measurement model. There were 5 latent factors, each with three or more indicators, in the model (Valence, Instrumentality, Career Decision-Making Self-Efficacy, Choice/Commitment Anxiety, and Lack of Readiness). The fit indices suggest that measurement model reached acceptable fit: (χ^2 (110, 207) = 189.21, p <.01; CFI = .96, RMSEA = .06; SRMR = .05). Convergent validity was supported for the measures, as factor loading ranged from .41 to .89, all significant at the p < .01 level. (See Table 1 for correlations, means and standard deviations)

The hypothesized model specified in Figure 1 was found to fit the data well with the fit indices reported in Table 2. Each of the fit indices was within acceptable bounds (χ^2 (114, N = 207) = 219.68, p <.01; CFI = .95, RMSEA = .07; SRMR = .07), so the hypothesized model was judged to be a good fit to the data.

To examine if our ordering of time perspective leading to career decision making self-efficacy leading to career indecision was appropriate, we examined a viable alternative where career decision making self-efficacy leads to future time perspective which leads to career indecision. The fit indices of this alternate causal model indicated that this model did not fit the data well (χ^2 (113, N = 207) = 330.06, p <.01; CFI = .88, RMSEA = .10; SRMR = .15).

To examine if the hypothesized model could be improved we examined the modification indices which indicated that only one parameter should be added to improve the model. The alternative model (ATL 1) was a version of our hypothesized model but with the direct relation between instrumentality and lack of readiness added. ATL 1 was fit to the data and resulted in the following acceptable indices of fit: χ^2 (113, 207) = 192, p < .01; CFI = .96; RMSEA = .07; SRMR = .06. There was a significant difference in chi-square between ALT 1 and HypModel (χ^2*diff* (1,207) = 27.63, p < .01), thus indicating ATL 1 to be a superior fit. However, we also wanted to select the model that was most parsimonious, thus removing any regression paths that were not significant. In the modified model (ALT 1a), the regression path from valence to career decision-making self-efficacy was deleted. The model was re-estimated with the paths deleted and resulted in the following acceptable indices: χ^2(114, 207) = 192.23, p < .01; CFI = .96; RMSEA = .06; SRMR = .06. There was no significant difference in chi-square between ALT 1 and Alt 1a (χ^2*diff* (1,207) = .23, p < .63) thus, we chose the revised model Alt1a as it is the most parsimonious. (See Figure 2)

Table 1 – *Correlations and Coefficient Alphas Among Valence , Instrumentality, Career Decision-Making Self-Efficacy, Choice/Commitment Anxiety and Lack of Readiness (n=207)*

	1	2	3	4	5	α
Valence	1.00					.69
Instrumentality	.40**	1.00				.84
Career Decision	-.10	.28**	1.00			.92
Choice/Com/Anx	-.12	-.20**	-.53	1.00		.96
Lack of Readiness	-.16*	-.47**	-.60	.35**	1.00	.92
M	23.82	51.34	95.60	80.64	29.40	
SD	4.10	6.34	13.99	27.11	10.74	

** $p < .01$

Table 2 – *Comparison of Nested, Competing Structural Equation Models for Future Time Perspective (n = 207)*

Model	χ^2	*df*	*p*	CFI	RMSEA	SRMR	χ^2 *diff*
HypModel	219.68	114	.01	.95	.07	.07	Alt1-HypModel = 27.68**
Alt 1	192.00	113	.01	.96	.06	.05	Alt 1-Alt 1a = .23
Alt 1a	192.23	114	.01	.96	.06	.06	Alt 1a-HypModel = 27.45**

Note. χ^2 = chi-square; CFI = comparative fit index; RMSEA = root-mean-square error of approximation; SRMR = standard root-mean-square residual; χ^2 *diff* = difference in chi-square log likelihood test. A significant chi-square difference tests indicate a significantly worse fit to the data for the model.* $p < .05$ ** $p < .01$

To test the magnitude and significance of mediation effects, we followed Shrout and Bolger's (2002) suggestion to use the bootstrapping procedure. Instrumentality not only directly predicted more CDSE (.33, $p < .01$), it also predicted less lack of readiness (-.37, $p < .01$), so there was only partial mediation of career decision-making self-efficacy in the instrumentaility and lack of readiness relation (-.58, $p < .01$). This suggested that the regression path from instrumentality to lack of readiness was reduced in-absolute size but was still different from zero when career decision-making self-efficacy was introduced. Individuals, who endorsed more importance on the relationship between present tasks and future goals, were more likely to be confident in their career decisions and less likely to be unprepared to make career-based decisions. Career decision-making self-efficacy completely mediated the relationship between instrumentality and choice/commitment anxiety (-.60, $p < .01$).

Thus, our hypothesis that career decision-making self-efficacy would be a significant mediator of the relationship between instrumentality and both choice/commitment anxiety and lack of readiness was supported. Given that valence did not have a path to career decision-making self-efficacy, we tested the mediation of valence through instrumentality for career decision-making self-efficacy, choice/commitment and lack of readiness. Instrumentality completely mediated the relation between valence and career decision-

making self-efficacy, choice/commitment anxiety and lack of readiness. All of the loadings from the regression paths were significant. (See Figure 2)

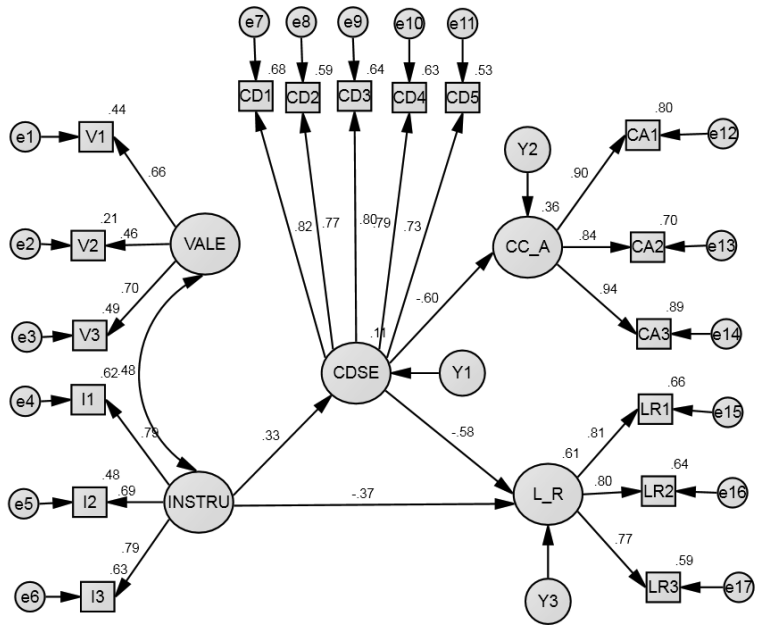

Figure 2. Standardized parameters estimates of the final model (Alt 1a) demonstrates relations between instrumentality (INSTRU), and career decision-making self-efficacy (CSDE), choice/commitment anxiety (CC_A) and lack of readiness (L_R). (-) Signifies an inverse relation between the variables.

Discussion

The purpose of the study was to test whether the theorized motivational properties of future time perspective could be applied to the career decision making of university students. We hypothesized that individuals' endorsement of valuing the future (valence), while taking requisite steps in order to achieve future goals (instrumentality), would predict higher levels of career decision-making self-efficacy. Career decision-making self-efficacy was expected to mediate the relationship between valence and instrumentality and choice/commitment anxiety and lack of readiness). Results of this study provide adequate support for our proposed structural model and proved to be superior to the alternative model in which career decision-making self-efficacy was the primary predicting variable. However, its generalizability is somewhat limited because this sample consisted of predominately White (62.4%) students. Second, although structural equation methods were used to test "causal" models, the data collected were cross-sectional and, thus, cannot provide evidence of actual causation. Finally, in this study, only two subscales were used to represent future time perspective which might limit the degree to which the construct of future time perspective is captured.

Ongoing research in this area could help improve interventions geared towards individuals seeking vocational guidance. While we recognize that these results pertain only to the relations among the variables in the current study, they may have some implications for how interventions can be designed.

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Chapter 19

Occupational choice factor and professional future perspective in early adulthood

Marina D. Petrash
Olga Y. Strizhitskaya
Saint Petersburg State University, Faculty of Psychology, Russian Federation
mp.07@bk.ru
olga_stri@hotmail.com

Abstract: This research is devoted to the formation of professional future emotional position in professional development among young adults. The study considers the relationship between occupational choice factor, emotional position to professional future and professional development factors. Participants (N=179) were divided into two groups: students (M. age=19, SD=1.3), young professionals (M. age =25.4, SD=2.4). Emotional position to professional future was measured with the M.Gynzburg questionnaire, including six scales: fear, anxiety, indifference, optimism, confidence, interest. The occupational choice factor included two special questions: 1) awareness of choice; 2) correctness of choice. Six professional development factors were measured by special questions: the professional development factors: "Contentment of a professional life" and "Professional Self-realization"; four professional activity factors: "Psycho-physiological recover", "Dedication", "Self-control of behavior", and "Interpersonal communication". Correlation analysis proved that the occupational choice factor correlates with emotional position to professional future and all professional development factors. The correct choice and negative modalities of emotional position to professional future were negatively and significantly correlated ($p \leq 0.001$). The correct and aware choice, positive emotional position modalities and all factors of professional development were positively correlated ($p \leq 0.01$; $p \leq 0.001$). The correct and aware choice was determined to be the most relevant predictor of positive position to professional future and constructive professional development.

Keywords: occupational choice, emotional position, professional future, professional development, predictor of positive attitude

Introduction

Professional self-determination based on a professional choice, professional orientation, which is of interest to the profession, and a leaning towards it allow the student to acquire the behaviors and qualities necessary in a particular person. The period of early adulthood involves three important stages in the professional development of a personality: learning in a professional college; entry into the profession and entry into the profession as a colleague.

After graduating from high school, the process of entering a profession begins. A young specialist masters the skills of his work and starts to improve his professional skills. When problems occur at the stage of entering the profession, the young person is not yet analyzing

whether or not his occupational choice was made correctly. It is crisis experiences that make him think about it, though it does not always happen to everyone (Petrash, 2011).

Our study was conducted to examine the relationship between factors of professional choice and emotional position to professional future in the context of the current situation of professional development for students and young professionals.

In accordance with the purpose of the study, tasks were aimed at exploring professional self-determination in choosing a profession, personal characteristics, satisfaction with professional development, and the study of coping strategies. We decided that the listed characteristics may serve as predictors of emotional attitude to professional future.

Method

Emotional attitude to professional future was measured with the M.Gynzburg questionnaire, including six scales: fear, anxiety, indifference, optimism, confidence, interest.

The occupational choice factor included two special questions: 1) awareness of choice; 2) correctness of a choice. A first question of the factors of the professional choice included three answer choices: a) chose profession carefully weighing their aspirations, abilities and personality characteristics; b) were not serious about a career in something; c) undefined. Answers to the second question: (a) fully confident; b) can't give a definitive answer; 3) I was sure that my choice was wrong.

Six professional development factors were measured by special questionnaires: the professional development factors: "Contentment of a professional life" and "Professional Self-realization"; four professional activity factors: "Psycho-physiological recover", "Dedication", "Self-control of behavior", and "Interpersonal communication" (Petrash, 2008).

Personal characteristics were studied using a Big five personality test questionnaire. Coping strategies were measured by Ways of Coping Questionnaire.

Participants

All participants (N=179) were divided into two groups: students (M. age=19, SD=1.3), young professionals (M. age =25.4, SD=2.4).

Statistical analysis

The software SPSS 17.0 for Windows was used to input and analyze the data.

Results

Occupational choice factor

All 179 young people were asked to evaluate their professional choices, attitude to their professional future, contentment with professional life, personality characteristics and coping strategies. Using cluster analysis, we identified the group with a different assessment

of their professional choices: survey questions: "how seriously did you come to the choice of a profession" and "score choice" (table 1).

Table 1 – *Groups with different assessment of their professional choices*

1 cluster	2 cluster	3 cluster
– frivolous approach to choice of profession – view incorrect – low score for yourself as a subject of professional activity.	– serious approach to the choice of profession – confident in choosing – high score for yourself as a subject of professional activity	– doubts about the correctness and awareness – average rating for yourself as the subject of professional activity

Occupational choice factor and professional future

For the students of the second and third clusters a predominance of positive modalities (interest, confidence and optimism) was revealed in relation to the professional future. Students of the first cluster with indifference had anxiety and fear in relation to their professional future.

The occupational choice factors were negatively related to scores on Gynzburg's scale of **"**indifference**"** (r=-0.373, p=0.000). On the other hand, awareness of a choice and correctness of a choice had a positive correlation with the positive relation to the professional future: r=0.496, p=0.000 (table 2).

For all clusters of young professionals a predominance of positive modalities was revealed (interest, confidence and optimism) in relation to their professional future. A negative attitude to professional future (fear, anxiety, indifference) negatively correlated with the factor of occupational choice: "correctness of a choice" (r=-0.281, p=0.006; r=-0.288, p=0.005 and r=-0.212, p=0.040 accordingly). "Awareness of choice" and "correctness of choice" related positively to scores on Gynzburg's scale of "confidence" and "interest" (r=0.255, p=0.013; r=0.270, p=0.008 accordingly).

Table 2 – *Scores of Gynzburg's scale (for the group of students)*

	1 cluster		2 cluster		3 cluster		F	*p*
	m	σ	m	σ	m	σ		
Fear	7	1.9	5	1.9	5.4	1.7	3.570026	0.033
Anxiety	8.6	2.8	6.8	2.9	7.7	1.9		
Indifference	8.7	4.9	4.4	1.9	5.1	2.4	9.283892	0.000
Interest	7.6	4.5	13.2	1.5	12.2	1.9	22.98761	0.000
Confindence	6.3	2	12	2	10.3	2.2	24.07467	0.000
Optimism	6.1	2.5	12.3	1.8	11	1.9	30.69216	0.000

Current situation of professional development

In the first cluster, as students and beginning professionals, the current situation of professional development was unfavorable. More respondents were identified as having low values of satisfaction with the profession (98% of students and 54% of young professionals) and a low desire for professional self-realization (85% of students and 36% of young professionals). The second cluster indicators of professional development were in the range of high values.

Coping strategies

The study of coping behavior of students, showed that the first cluster is dominated by strategy**:** Accepting Responsibility**,** Escape-Avoidance**,** Distancing**,** Self-Controlling**,** Confrontive Coping**.** In the third and second clusters: Planful Problem Solving**,** Positive Reappraisal**.** Young professionals of the first cluster used Confrontive Coping, while the subjects of the second and third clusters used a strategy of Planful Problem Solving**.**

Personal characteristics, occupational choice factors and emotional position to the professional future

For a group of students the occupational choice factors ("awareness of choice" and "correctness of choice") were negatively related to the personal characteristic of "Emotional Stability" (r=-0.232, p=0.033; and r=-0.348, p=0.001 accordingly). A comparative analysis indicated a "low" level of "Emotional Stability" for students in the first cluster.

The personal characteristic of "Extraversion" had a negative correlation with the factor of occupational choice: "correctness of choice" (r=-0.215, p=0.037). A personal characteristic of "Emotional Stability**"** related positively to scores on Gynzburg's scale of "anxiety" (r=0.263, p=0.010).

Discussion

The study revealed that the fact of "premeditated choice" of occupation favors constructive evaluation of their professional development; increases positive modalities in relation to their professional future, and reduces fear and indifferent attitudes. Each stage of professional formation is determined by its content.

Using regression analysis, we have shown that predictors of the positive attitude to professional future among students are factors of occupation choice; contentment with professional life, self-realization in the profession, interpersonal communication, and self-control of behavior; personal characteristics: affection, coping strategies: positive reappraisal, planning, problem solving and responsibility.

Self-realization in the profession, Psycho-physiological recover, interpersonal communication; personal characteristics: attachment and extraversion, and coping-strategy plan-

ning solutions selected are characteristics which are predictors of a positive attitude to the professional future of young professionals.

Our other results showed that low values of satisfaction with the profession, low desire for professional self-realization; predominance of negative modalities (fear, anxiety, indifference) to professional future and coping strategies: Accepting Responsibility**,** Escape-Avoidance**,** Distancing**,** Self-Controlling**,** Confrontive Coping of early adulthood, could be linked with professional turning points.

Conclusions

1. The awareness and correctness of the occupational choice factor may have a positive impact on the professional future and relevant measures should be taken to reduce the experience of professional turning points.
2. Both professional future esteem and evaluation of the current career situation depend on the motivational involvement of a person in the process of professional self-determination while making an occupational choice ("premeditated choice").
3. The correct and aware choice was determined to be the most relevant predictor of a positive attitude to professional future and constructive professional development.

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Chapter 20

The influence of Future Time Perspective in career decision-making: The mediating role of work hope

Paula Atanásio
paulatanasio@gmail.com

Maria Paula Paixão
mppaixao@fpce.uc.pt

José Tomás da Silva
jtsilva@fpce.uc.pt
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal

Abstract: Career decision making (CDM) remains a core construct within Career Counseling research and practice. The notion of career implies a future time perspective (FTP), since future orientation is central to define vocational goals and therefore the pathways to achieve them. Complementarily, Work Hope (WH) is a psychological resource that implies goal-directed thinking, agency and pathways. However, little is known about the functional relationships between these variables, and the possible influence mechanisms of FTP and WH in CDM remains an understudied topic. The present study aims to (1) To analyze the relationship between FTP, WH and CDM; (2) to assess the mediation effect of WH in the relationship between FTP and adult CDM. Sample included 205 individuals attending adult education courses (age range: 18-61 years old; mean age: *M*=37.01, *SD*=10.82; gender: 54% male; low socio-economic background: 66.2%). Future Time Perspective Scale, Work Hope Scale, Career Indecision Scale, and a socio-demographic datasheet were administered to participants. Pearson correlation matrixes were obtained to examine the association between variables, and mediation effects were tested using the internet version of MedGraph-I (Jose, 2003). Moderate associations were observed between FTP and WH (r=.30, p<.001), WH and CDM (r=.46, p<.001), and FTP and CDM (r=.21, p<.01). WH was found to mediate the relationship between FTP and CDM (*Sobel z*= 3.72, p<.001; *lower 95% SCI*= .05, *upper 95% SCI*= .15). Despite its cross-sectional design, and the likely mutual relationships between assessed variables, results from the present study suggest interesting functional hypotheses to be tested in future longitudinal studies. In the context of career counseling, interventions targeting FTP may positively impact CDM through the development of WH as psychological resource.

Keywords: future time perspective, work hope, career decision.

Introduction

Change is a hallmark of today's society. The changing patterns of work conditions and demands are quite distinct from those observed at the beginning of the 20th century, and therefore, the context of decision making in general has dramatically changed. At the present moment, people are expected to make decisions in different moments and across a variety

of contexts, within an overall framework of uncertainty and constant change. Since this is particularly the case for work contexts and related career decision requirements, career decision making (CDM) stands nowadays as a major core construct within Career Counseling. Although the importance of time perspective interventions has been acknowledged for assisting clients' decision making processes (Savickas, 1991), the determinant role of future time perspective (FTP) in CDM remains understudied. Moreover, little is known about the potential variables and mechanisms through which FTP may influence CDM. Research on these matters is greatly needed, because the empirical evidence derived from those studies would enable a better understanding of factors related to CDM and hence improve counseling interventions designed to promote adaptive career decisions.

During the last decades, different theoretical formulations have attempted to describe CDM processes, by systematically identifying difficulties related to career indecision (Gati, Krausz & Osipow 1996). These theoretical proposals aimed at either prescribing how to make the best decision (normative or prescriptive models), or at understanding how people actually make decisions (descriptive models) (Germeijs & De Boeck, 2002). Notwithstanding the definite relevance of these theoretical developments, the positive concept of "career decisiveness" may be seen as complementary to the more negative notion of "career indecision", and hence portray a broader picture of CDM processes and outcomes (Savickas, Carden, Toman & Jarjoura, 1992). Career decisiveness is defined as "an individual's certainty about his/her career decision, where certainty relates to the extent an individual is convinced that he/she can make a career" (Osipow, Carney, Winer, Yanico, & Koschier, 1987, cit in Pečjak & Košir, 2007). Since people's inability to think in terms of time perspective has been suggested as a good indicator of their career indecision level (Savickas, Silling, & Schwartz, 1984), the study of the related concept of future time perspective (FTP) and its associations with career indecision and career decisiveness provides a promising research venue.

The notion of "career" intrinsically implies a FTP, since future orientation is central to defining vocational goals and therefore the pathways to achieve them (Marko & Savickas, 1998). FTP can be defined as the individual's perception about his future (Husman & Shell, 2008), and the anticipation of future goals in the present moment (Simons, Vansteenkiste, Lens & Lacante, 2004). FTP is best conceptualized as a multidimensional phenomenon, encompassing four dimensions: "Value" (also termed as "Valence"), representing the valuing of the future and the willingness to make sacrifices in the present to support the future; "Connectedness", the perceived connection between present activities and future goals; "Extension", pointing to an individual's time horizon; and "Speed", relating to the speed at which individuals feel the passing of time. Recent research on the associations between FTP and CDM self-efficacy and indecision, revealed that individuals who understand the importance of the relation between present steps and future goals (i.e. who perceive increased instrumentality related to FTP), tend to have more confidence in their ability to make decisions, and thus experience less anxiety about choosing and committing to a career (Walker & Tracey, 2012). Interestingly enough, these results were in line with previous reports of general time perspective as an important determinant of adolescent career decision making (Savickas et al., 1984).

Complementarily to the significance of FTP in CDM, Savickas (1990, p. 3) highlighted that a "hopeful temporal experience prompts the self-conscious awareness of a subjective career and engenders the planful attitudes and planning competencies that are critical to

career decision making and adjustment". Within the context of career decision research, this important claim implicitly argues for the consideration of the positive concept of "hope", and more specifically, "work hope". Work hope (WH) may be assumed as a psychological resource and is defined as "a positive motivational state that is directed at work and work-related goals and is composed of the presence of work-related goals and both the agency and the pathways for achieving those goals" (Juntunen Wettersten, 2006, p. 97).

Given the utility of mediation analyses for going beyond the merely descriptive relationships among variables (Preacher & Hayes, 2004), as well as its pertinence for theory development and intervention refinement (Shrout & Bolger, 2002), the present study had two main objectives: first, to assess the relationships between FTP, WH and CDM (i.e. career decisiveness) in adult trainees; and second, to examine the mediating effect of WH in the association between FTP and career decisiveness. Following the available literature and empirical research, it was predicted that moderate positive associations would be verified for the correlations between FTP, WH and career decisiveness. Despite the fact that the mediating effect of WH was also examined, no specific predictions were made in that regard.

Method

Participants

The convenience sample for this study (N = 205) was recruited in an urban school located in the North region of Portugal, between February and May 2011. The following inclusion criteria were considered: a minimum age of 18 years old, and the attendance of an adult educational/training course. Two hundred and thirty-five subjects were then assigned to participate in the study, but only 220 were administered the research assessment protocol, since the remaining 15 subjects dropped out from the courses they were attending or were absent during the established periods for sample collection. After completion, 15 cases were further excluded: 7 cases did not complete all the intended measures, and 8 cases reported an updated professional status of "retired".

Measures

Career Indecision Scale (CIS) (Germeijs & De Boeck, 2002). CIS is a measure used to assess career indecision. This scale was constructed based on the eleven descriptors for difficulties in making decisions, identified by Germeijis and De Boeck (2002) (e.g. taking a long time to decide; finding it difficult to make a decision). For each feature a positive item and a negative one was formulated, to counteract response tendencies (e.g.: "I find it easy to make this decision"/"It is hard for me to come to this decision"). The 22-item scale is to be scored in a 5-point Likert scale from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Given the scope of the present study, which was mainly interested in examining the associations between WH and FTP (two "positive" constructs) and CDM, we opted to revert all negative items, in order to achieve a "positive" overall score that might be indicative of "career decisiveness" (as opposed to "career indecision"). Adequate scale internal consistency was verified within the study sample (α = .83).

Work Hope Scale (WHS) (Juntunen & Wettersten, 2006). The WHS assesses work-related hope. The 24-item measure consists of three subscales: Agency (e.g. "I don't believe I will be able to find a job I enjoy"; "I doubt my ability to succeed at the things that are most"); Pathways (e.g. "I have a plan for getting or maintaining a good job or career"; "There are many ways to succeed at work") and Goals (e.g. "I expect to do what I really want to do at work"; "When I look into the future, I have a clear picture of what my work life will be like"). Participants were asked to indicate their level of agreement on the statements using a 5-point Likert scale from 1 (*Strongly agree*) to 5 (Strongly disagree). Total scores varied between 24 and 120, with higher scores indicating increased work hope. Good internal consistency values were found in our sample for the overall scale (α = .80).

Future Time Perspective Scale (FTPS) (Husman & Shell, 2008). The FTPS is a self-report measure to assess the individual's future time perspective, along its four dimensions: Value (7 items); Extension (5 items); Speed (3 items) and Connectedness (12 items). The FTPS comprises 27 items, to which respondents must indicate their agreement within a 5-point Likert scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Acceptable internal consistency values were observed in this study sample for the overall scale (α = .78).

Procedure

Authorization to collect data was obtained from the school's Direction Board. This school offered a variety of adult training/education courses, which were developed within the recent Portuguese political-educational initiative of "Novas Oportunidades" (*literally:* "New Opportunities"). Following an initial contact with the designated teacher, questionnaires were administered to trainees in the classroom, during the adult education sessions. Questionnaires took approximately 20 minutes to complete, under the supervision of the study's main researcher. Informed consents were obtained from all the subjects participating in the study, prior to their completion of the research assessment protocol.

Data Analysis

Descriptive statistics for socio-demographic variables were used to characterize the obtained sample. As regards the data from FTPS, WHS and CIS, missing values were replaced with item means. Internal consistency for the adopted measures was assessed through the calculation of their Cronbach's alphas, which were then classified as acceptable ($\geq$ .70) and optimal ($\geq$ .80) (Nunnally & Bernstein, 1994). Pearson correlation matrixes were obtained to examine the association between variables, which were then classified as weak (.10 to .29), moderate (.30 to .49) or strong ($\geq$ .50). For the examination of mediation effects, the online version of MedGraph-I (Jose, 2003) was chosen, because this online computational tool simultaneously provides information on the verified type of mediation (i.e. partial, full) and the underlying Sobel test, as well as providing a straight and clear graphical display on the observed mediation effects. Following Baron and Kenny's (1986) recommendations, three assumptions were to be met in order to detect a mediational effect: (1) there should be a significant relationship between the independent variable (i.e. the predictor) and the dependent variable (i.e. the criterion); (2) there should be a significant relationship between the independent variable and the mediating variable;

(3) the mediator had to be a significant predictor of the outcome variable in an equation including both the mediator and the independent variable.

Results

Sample Characteristics

The obtained sample included 205 participants (54.4% women) within an age range between 18 and 61 years old (M = 37.01, DP = 10.82). The majority of participants (71.9%) had completed the secondary level of school (between 9 and 12 years of school). In this sample, most of the cases were classified as pertaining to low/medium socioeconomic backgrounds (97.5%), and 60.7% of the participants were employed, in contrast to 39.3% of unemployed participants (see Table 1).

Table 1 – *Socio-demographic and educational characteristics of the sample*

		n	%
Age (*M*/*DP*) = 37.01/10.82			
	18-30 years	61	30.2
	31-45 years	92	45.5
	+46 years	49	24.3
	TOTAL	202	100,0
Gender			
	Male	93	45.6
	Female	111	54.4
	TOTAL	204	100.0
Socioeconomic Status (SES)			
	Low	133	66.2
	Medium	63	31.3
	High	5	2.5
	TOTAL	201	100.0
Professional Status			
	Employed	119	60.7
	Unemployed	77	39.3
	TOTAL	196	100.0
Educational Level			
	4th grade	8	3.9
	6th grade	37	18.2
	9th grade	146	71.9
	12th grade	12	5.9
	TOTAL	203	100.0

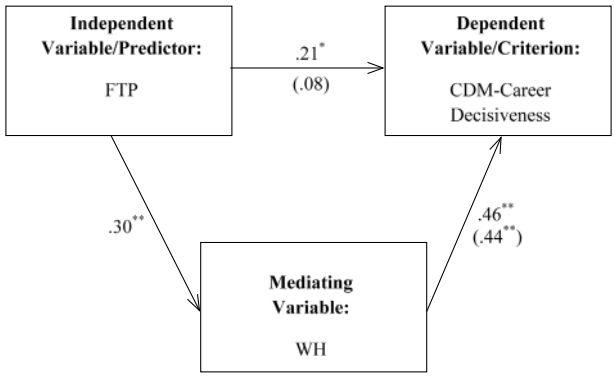
Note. Socioeconomic status (SES) was determined using a classification system based on the individual's job and educational level (Simões, 1994).

Inter-correlations between the Variables

Moderate associations were observed between FTP and WH (r = .30, p<.001), WH and CDM-Career Decisiveness (r=.46, p<.001), and weak between FTP and CDM-Career Decisiveness (r=.21, p<.01).

Mediational Analyses

A mediator effect of WH was observed in the association between FTP and CDM-Career Decisiveness (Figure 1), since there was a significant drop in the coefficient for the relationship between FTP (independent variable/predictor) and CDM-Career Decisiveness (dependent variable/criterion), after the mediating variable (WH) was entered (r = .21, p < .01 to r = .08, *ns*; *Sobel* z = 3.72, p < .001).



Note. ** p < .001, * p <.01

Figure 1. The mediating effect of WH on the link between FTP and CDM-Career Decisiveness.

Discussion

This study aimed at assessing the associations between FTP, WH and CDM (career decisiveness), and further examining the mediating role of WH on the relationship between FTP and CDM-Career Decisiveness. This study's findings confirmed our hypothesis that FTP, WH and CDM-Career Decisiveness were positively and moderately associated, apart from FTP and CDM with a weak association. This finding was in agreement with previous research on the associations between FTP and career decision variables (Walker & Tracey, 2012) and added empirical support for the theoretical claim that hopeful temporal experience may play a determinant role in CDM (Savickas, 1990). Moreover, evidence was found for a mediator effect of WH, thus suggesting that an individual's FTP may be linked to his/her CDM-Career Decisiveness, through his/her perceptions of WH.

These findings suggest that interventions focusing on the development of the individual's FTP, may improve his/her CDM, while increasing his/her career decisiveness. Findings from this study also validated a potential mechanism via which FTP may exert

its effects on CDM-Career Decisiveness, namely through perceived work hope. For this reason, interventions targeting FTP and aimed at improving CDM outcomes should incorporate measures on the construct of WH, in order to effectively plan and monitor the intervention process.

This study had the merits of exploring patterns of associations between the more classical variables, such as career decisiveness, and the relatively more recent variables in Vocational Psychology, such as FTP and WH. Nevertheless, its cross-sectional design stands as it major limitation, since directionality cannot be inferred; in addition, caution must be taken in generalizing the observed results, since they were obtained from a sample with rather specific age, educational and professional characteristics.

Despite these limitations, this study's results offer promising insights that may be further examined in future longitudinal studies, possibly in other adult populations. In that sense, the utilization of more sophisticated statistical procedures, such as structural equation modeling and/or bootstrapping procedures, would be highly recommended as they currently represent analytical alternatives with the greatest statistical power. Finally, it would be interesting to test the plausible hypotheses that multiple variables may operate in the links between FTP and CDM, and that such indirect effects may operate distinctively for different groups; for these purposes, the so-called multiple mediation and moderated mediation analyses would be warranted.

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Chapter 21

The role of feedback from teachers in the perspective of future development of young's career attending courses EFA and PIEF

Dulce Martins
Carolina Carvalho
Institute of Education of the University of Lisbon, Portugal
dulcemartins24@portugalmail.pt
cfcarvalho@ie.ul.pt

Abstract: This paper intends to clarify how the teachers' feedback influences the development of perspective for the future of young people attending professional courses of Education and Training of Adults (EFA), and an integrated programme of education and training (PIEF), in the Lisbon metropolitan area. The main goal is to understand how young people at this stage of their lives, while professional school students, perspective the choice or the decision of a professional future, through the feedback from teachers about their school results and their educational trajectories. In this study, 42 youths participated in Lisbon, of which 31 were attending professional courses EFA and 11 integrate a PIEF group. These young participants were between 13 and 19 years. The methodological plan used included, in addition to collecting socio-demographic identification data, the application of a questionnaire with six issues of open response and the scale *Dellas Identity Status Inventory-Occupation* (DISI-O; Dellas & Jernigan, 1981, adapted by Taveira, 1986), to evaluate the development modes of construction of identity of a future career through feedback from teachers. The generality of the results at scale DISI-O dimensions, it was possible to verify that the young people show contrasting results in the statuses *Foreclosure* and *Moratorium*. These results seem to indicate that although these young people are attending a professional course, show little engagement in exploring development options and career building, and therefore have difficulty in making safe decisions or choices, especially the younger ones.

Keywords: feedback, teachers, youth, career, EFA and PIEF courses.

Introduction

Education policies followed in Portugal, based on benchmarks of European Union (e.g. European Council, 2006, 2007; UNESCO, 2000) highlighted the importance of the role of formal education of young people, which occurs in school context, in the construction and development of essential skills to preparing young people for active life (Carvalho *et al*, 2008). Being one of the missions of the school encourage the appropriation of knowledge, enabling young people to become active citizens, the role of feedback from teachers is an effective resource in the creation of opportunities for exploration, interaction and relationship in the development of young's future career perspectives (Almeida, 2008; Coimbra, 1995; Taveira, 2000; Veiga & Moura, 2005, Vega, 2009).

Some recent research on meta-analysis explain feedback is "the most powerful influences on achievement" (Hattie, 2009, p.173). In model of feedback proposed by Hattie and Timperley (2007), it is recognized the importance of feedback in the formative process of questions like "where am i going", "How am i going" and "where to next". The feedback effect integrates the temporal flow of personal and formative experiences, as the parties of past, present and future (Zimbardo & Boyd, 1999). In this sense, it seems for us, that the feedback acquires a fundamental role in the development and vocational guidance of young people, to help in choices and decisions for a future job or profession (Savickas, 1997/1998).

Methodology

Participants and procedure

In this study participated 42 young people (all male), between 13 and 19 years old (M = 16.5 and DP = 1.46). These young people integrated 4 courses, one of them being equivalent of 5 and 6 grade and the remaining three that had professional curricula (courses of Education and Training of Adults-EFA) at the 7, 8 and 9 grades of elementary school. The respective courses was designated: Integrated Programme of Education and Training (PIEF), Waiter, Kitchen and Maintenance Hotel Operator (OMH). Filling in the questionnaires was supervised by the investigator in the courses above mentioned. This task took place in the normal hours of the courses training and the youths collaborated voluntarily, taking up all the time that was necessary to fill in the questionnaires properly.

Instruments

It was used *Dellas Identity Status Inventory Occupation* scale (DISI-O) that has already been adapted to the Portuguese population by Taveira (1986), has 35 items sorted into 5 statutes of vocational identity, similar to the taxonomy developed by Marcia (1964, 1966): achievement, moratorium, foreclosure, and diffusion-diffusion and diffusion-luck. We also used a open-end questionnaire with six issues to assess how these young people perceived the feedback from teachers in the construction and development of vocational identity.

Results

On the analysis and discussion of the results of this study, had taken into account the following central goals: a) Evaluate the characteristics of vocational identity of young participants, according to age and the courses; b) knowing the perceptions of young participants about the feedback from teachers in the development of perspectives of professional future.

Characteristics of vocational identity of young participants

In Table 1, is organized the data collected through the DISI-O scale to evaluate the characteristics of the vocational identity of young participants, according to age and courses in training. In this Table, the age of young participants was considered in three groups. These age groups are designed based on the mean of age of young participants.

Table1 – *Statistical elements according to age and courses in training of young participants*

Course	Mean (in years)	Statutes of Vocational Identity									
		Achievement		Moratorium		Foreclusure		Diffusion-Diffusion		Diffusion-Luck	
		M	Std. Deviation	M	Std. Deviation	M	Std. Deviation	M	Std. Deviation	M	Std. Deviation
PIEF (N=14)	15,5	21,3571	6,80053	24,8571	5,9337	19,2142	7,62766	23,5000	5,14033	21,9286	5,83707
Waiter (N=9)	16,7	25,7777	5,51764	27,7777	6,74124	22,6666	6,87386	23,6666	7,07106	22,2222	5,09356
Kitchen (N=9)	16,4	24,6666	3,24037	25,8888	4,45658	21,6666	4,27200	24,3333	2,91547	22,6666	3,53553
O M H (N=10)	17,8	25,0000	6,27162	25,9000	5,40473	19,7000	4,49814	22,0000	5,51764	21,0000	6,78233

In general, the results obtained through the application of the scale DISI-O, allow us to find a line with the vocational identity theory and with previous studies (e.g. Dellas & Jernigan, 1981; Taveira, 1986, 2000; Taveira & Campos, 1987; Blustein & Noumair, 1996; Veiga & Moura, 2005). In particular, in terms of vocational identity, most of the young participants, are in full period of adolescence, stays in the status of identity moratorium, which is characterised by young people who are living a period of exploration of the issues of identity, expressing difficulty in making choices. In this situation, we also realize that in spite of the young participants in this study are attending professional courses, which main goal is essentially enable them acquiring essential skills for a future career, these ones reveal difficulties in defining a vocational guidance.

Perceptions of young people about the feedback from teachers in the development of the future career

From the 42 young participants, only 38 completed the open-end questionnaire. In this study, from the 6 issues worked in questionnaire, we present the following questions:

- In the assessments that you receive from teachers, did you ever feel that this was the course that you wanted to attend to find a job/profession?"
- Do you think important that teachers advise or explain which course/profession/job you should choose?

The construction of categories consisted of group, by content similarity, the justifications given by young people for each of the questions in open-end format (Bardin, 1977; Patton, 1990). The categories and the frequency are present in Tables 2 and 3.

- ***Open-end responses***. Emergent response categories are presented in Table 2 regarding the question, "In the assessments that you receive from teachers, did you ever feel that this was the course that you wanted to attend to find a job/profession?"

Table 2 – *Emergent Categories:"In the assessments that you receive from teachers, did you ever feel that this was the course that you wanted to attend to find a job/profession?"*

Category	Answer	Frequency
Interest	"Yes, when I joined this training, I felt that this was the right course"	8
	"Yes, because the teachers tell me that *I have got the way*"	4
	"Yes, when teacher praises me and says that I have way, gives me more desire to follow the course"	5
Disinterest	"No"	13
	"No, because the course has nothing to do with me"	5
Indecision	"I don't know", "Not at all, it is too early"	3
	Not answered	1
	Total	38

Table 3 – *Emergent Categories: "Do you think important that teachers advise or explain which course/profession/job you should choose?"*

Category	Answer	Frequency
Guidance of vocacional Comments	"Yes, because teachers have more ability to say what we should follow and what is best for us"	10
	– "Yes, because teachers are daily with me and know what I have way/capacity"	2
Career Comments	– "Yes, because they have years of life and experience"	4
	"Yes, because young people as me do not care much to this issue [job], they give time to time, which appear is well"	2
	"yes"	6
Disinterest	"No, because I think I have to make that decision"	9
	"No, because the profession I choose will depend on the way and the commitment and love that I will have for "	1
	"No"	2
Indecision	"I do not agree or disagree"	2
Total		38

The most frequently cited response implicated disinterest. The young participants considered the feedback is not relevant, maybe because some of them are not identify themselves with the course "... the course has nothing to do with me" or simply by feel

undecided and consider is "... too early" to reflect on this issue. However, 17 of the 38 responses think that de comments from teachers are motivators. As in the study of Hattie (2003) "It is what teachers know, do, and care about which is very powerful" (p.2) in the achievement process, because teachers are the ones who most be able to monitor, understand, and interpret students with more insight. "As a consequence they seek and provide more and better feedback in light of this monitoring" (p.8).

Emergent response categories in Table 3 are concerned about the question "Do you think important that teachers advise or explain which course/profession/job you should choose?"

In Table 3 is possible to see that the majority of the answers of the young participants consider teachers' opinion important for to have a choice in a future career. They consider that teachers provide effective feedback "...because they have years of life and experience", helping them to better identify the individual skills "...because teachers are daily..." present with their students. 2 of the 38 young's also consider that the feedback from teachers are important because young people "...do not care much to this issue, they give time to time, which appear is well" and in this way teachers can encourage students student to think in future. In this way, like in above the discussion of Table 2, teachers are seen by the young's as experts who monitoring some problems providing relevant and useful feedback (Hattie, 2003).

Final Considerations

In a society, where teachers have a strong influence on personal and social development of young people, the feedback is an important component of pedagogical process, which provide support of the development of the perception of future career of young people (Brookhart, 2008).

According to the results of this work, it is possible to understand the importance that the young participants give to feedback as a guidance practice to develop their vocational identity, because the majority of young people are in a phase of identity moratorium, in which not yet reveal the ability to make choices or elaborate coherent projects for a future career. It is perhaps in this way that in second analysis of youth answers from the open-end questionnaire, it is possible to understand that the majority of young people considers the feedback from teachers, is a consequent practice, since teachers are seen as experienced professionals of school pathways of their students. As such, the feedback comments are mostly understood as motivators, coaches and clarifiers of future perspective of career development and construction.

One of the feedback advantage is that it is aligned with many of best practices associated planning and development vocational choices and life projects of young people (Almeida, 2008; Brookhart, 2008; Taveira, 2000; Veiga & Moura, 2005, Fisher & Frey, 2007; Vega, 2009). In the Hattie (2003) opinion the feedback is "the most powerful single moderator that enhances achievement" (p. 8)

The feedback has generally positive effects in classroom interventions as an educational guidance for promoting the development of future career perspectives (Hattie, 2009). This guidance practice in school context has numerous advantages in personal and social training of our young people, since for many of them school can be a single opportunity

to support the process of construction and development of vocational identity, allowing them access to vocational training and thus facilitating the transition to active life (Taveira, 2000, 2004). In Savikas (2005) opinion, "the goal of the school-to-work transition is that emerging adults learn to contribute to society by fitting their personalities into suitable work roles. The social expectation that adolescents seek occupations congruent with their abilities and interests is communicated to them in the form of vocational development tasks" (p.49). This transition between school and a future career, in addition to helping youth in their vocational choices, promoting the social inclusion of young people, helping them in their integration into the workforce.

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PART 5

TIME PERSPECTIVE IN EDUCATION AND LEARNING

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Chapter 22

Why is the distance between what we know and what we don't know always beyond of what we can achieve with our velocity of learning?

Nuno Álvaro Ferreira Rodrigues
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal
xeurekax@hotmail.com

Alexander Kovacec
Faculty of Science and Technology, University of Coimbra, Portugal
kovacec@mat.uc.pt

Ana Cristina Ferreira de Almeida
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal
calmeida@fpce.uc.pt

Abstract: Learning and use of what is learned is not restricted to school. But, besides knowledge, will and management skills are necessary to reach the pace. The social implementation of the intellectual booty highlights the mathematical mastery of the population, so that knowledge of mathematics should be an integral part of an individual and an educational priority. Although it is true that the construction and consolidation of knowledge happens throughout life, adolescence is undoubtedly one of the most important and sensitive periods, anticipating further capacity building. In Portugal, the results obtained by students in the national exams are, on average, bellow the expected. Unfortunately, educational reforms implemented over the past decades have not solved this problem. How can we motivate students to devote time and energy to the study of mathematics now for their future success? Which strategies catalyze good performances for lifelong learning? Heuristics! Our research project has started with a workshop for high school teachers at an Educational Center, in Coimbra, in 2011. Meeting sessions were devoted to mathematical problem solving supported by George Polya's model. Teachers were invited to apply this methodology to ninth grade students, through the 2011/2012 school year. In parallel with the tracking results by solving selected questions extracted from the *International Mathematical Kangaroo* competition, pupils had to answer a questionnaire about their attitudes towards Math and Problem Solving in the beginning and at the end of the school year. In this paper we explore the promise of learning Mathematics problem-based to shorten the distance between what we do not know and willingness to learn. This is a glimpse into mathematical problem solving practice in a time perspective.

Keywords: heuristics, mathematics, problem solving, time perspective.

Once upon a time…a never ending story called Math

Progress is built with knowledge resources and due to that mathematics is always under construction. As one more level is added to the structure we are in position to see far away

and get a better conscious of the great beyond. If the tools used in this endeavor have become more sophisticated and efficient, it is also true that the effort made to place one more brick is undoubtedly greater.

Spread along Pregel River banks, Konigsberg city, in the 18th century, was the center of a puzzling problem. In the course of History, for better mobility, there were built seven bridges and since then the inhabitants wondered about the possibility of walking on all, without recurrence. They tried to accomplish that goal but without success. Unable to find a solution, the mayor of Danzing asked Leonhard Euler, who lived at St. Petersburg, for help. The answer came swiftly.

> *"Thus you see, most noble Sir, how this type of solution bears little relationship to mathematics, and I do not understand why you expect a mathematician to produce it, rather than anyone else, for the solution is based on reason alone, and its discovery does not depend on any mathematical principle. Because of this, I do not know why even questions which bear so little relationship to mathematics are solved more quickly by mathematicians than by others."*
>
> (Hopkins & Wilson, 2004)

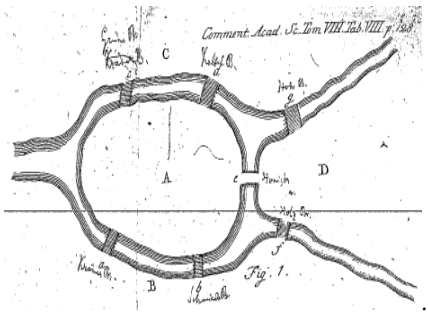

Figure 1

Despite Leonhard Euler's words, he realized that his reasoning, presented to the St. Petersburg Academy on August 26th, 1735, and originally published in 1741 *(Figure 1)* was a breakthrough in Math, starting a new branch today known as graph theory.

To explore the *Konigsberg Seven Bridges Problem* let's engage into George Pólya four steps problem solving model.

What does the problem say?

Challenge the reader to travel along Konigsberg seven bridges without repetition, establishing a network between banks and two islands in the river bed.

Is more information regarding the problem statement available?

Yes. The 18th century Konigsberg city map.

Are there restrictions regarding the place where the path should start?

No. The travel can begin on the coast or in any one of the small islands.

After some attempts is the pathway revealed?

No. Under the problem restrictions it appears to be missing always a bridge.

How can we represent the problem?

Symbolize the north, south and both islands by points and each bridge by a line (Figure 2).

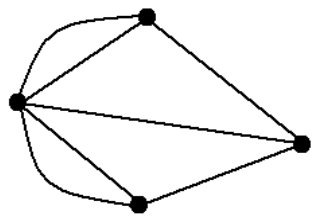

Figure 2

Does the diagram exhibit data that has not yet been analyzed?

Yes. It allows identifying, in a clear way, the number of bridges connected to each point (Figure 3).

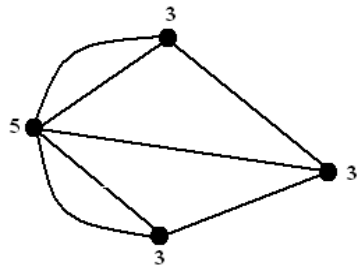

Figure 3

To arrive and depart, the place must be connected to bridges, in even number. If all dots are connected to even number of segments, then the tour can begin and end in the same place (circuit). If all dots are linked to even number of segments, except two, the route (path) is also possible, and it starts and ends in place with odd number.

Is it possible to do a circuit?

No, to accomplish that goal all locations should be linked to even number of bridges.

Is it possible to do a path?

No, because to accomplish that goal all locations, with the exception of departure and arrival, should be connected with an even number of bridges.

The problem has no solution! What happens if one bridge is withdrawn?

Regardless the bridge subtracted it is always possible to complete a path.

The *Konigsberg Seven Bridges Problem* was quickly solved but in Math that doesn't always happen. Pierre de Fermat, in his copy of the book *Arithmetic* from Diophantus, wrote, around 1637, in the margin, next to the sum of squares problem, that , with n greater than two, and x, y, z, n positive integers, didn't have solution. Unfortunately, in his words, he couldn't write the proof there due to the lack of space.

Since then he has no more revisited the subject. After Pierre de Fermat's death in 1665, the son, Clément-Samuel Fermat, has published in 1670, a new edition from *Arithmetic* with his father's notations. For more than three hundred years professional and amateur mathematicians tried to demonstrate Pierre de Fermat statement, all without success, despite some major progress made in the 19th and 20th century. Then, on June, 23rd 1993 Andrew Wiles announced at the Conference of Sir Isaac Newton Institute for Mathematical Sciences, in Cambridge, the most wanted proof to *Fermat's Last Theorem*, so called because all the remaining observations of the French mathematician had already been demonstrated. Later, inaccuracies were found, but Andrew Wiles didn't give up and returned to work on his proof, accomplished his goal, then published on 1995 Annals of Mathematics.

> *"Perhaps I could best describe my experience of doing mathematics in terms of entering a dark mansion. Because, when one goes into the first room and it's dark, completely dark one stumbles around bumping into the furniture, gradually you learn where each piece of furniture is, and finally after six months or so you find the light switch, you turn it on, suddenly it's all illuminated, you can see exactly where you were."*
>
> (Singh & Lynch, 1996)

For n equal to one there is an infinity number of solutions. Replacing n by two it is still possible to solve the problem. Solutions (x, y, z), such as (3, 4, 5), are called Pythagorean triple, numbers that fulfill the equation . *Fermat's Last Theorem* is an expansion of this problem with n integer, greater than two.

> *"I never use a computer. I sometimes might scribble, I do doodles, I start trying to find patterns really, so I'm doing calculations which try to explain some little piece of mathematics and I'm trying to fit it in with some previous broad conceptual understanding of some branch of mathematics. Sometimes that'll involve going and looking up in a book to see how it's done there, sometimes it's a question of modifying things a bit, sometimes doing a little extra calculation, and sometimes you realize that nothing that's ever been done before is any use at all, and you just have to find something completely new and it's a mystery where it comes from."*
>
> (Singh & Lynch, 1996)

Introduced to *Fermat's Last Theorem* at age of ten, since then Andrew Wiles was amazed with the statement and his open ended demonstration, *"I had this very rare privilege of being able to pursue in my adult life what had been my childhood dream."* (Singh & Lynch, 1996). We can argue about how to unlock hard problems. The master key is study with method, acquired by experience, throughout time, only then it is possible to become expertise in the Art of Problem Solving.

Today, the *Goldbach's Conjecture* is one of the greatest mathematical challenges to human intelligence. Until now no one has been capable to prove that all even number,

greater that two can be written as sum of two prime numbers. The quest began on 1742 with a letter from Christian Goldbach to Leonhard Euler and despite important steps forward, it remains open ended. Resilience is essential to overcome difficulties, as control, beliefs, resources and heuristics are to establish connections between different issues.

Theoretical models put into practice give us a better understanding of the complex mechanisms engaged to produce learning.

Problem Solving in a Time Perspective Framework

After this review, throughout the History of Mathematics, concerning problems with different temporal horizon perspectives demanding specific knowledge and reasoning, complex psychological activities and resilience, the authors anticipate that structural changes only come with time. If Problem Solving is shaped by metacognition processes that can be self-regulate allowing autonomy and learning with significance it is also true that cognitive achievements are formed by motivational aspects. The conceptions, attitudes, and expectations of the students regarding mathematics and mathematics teaching are considered to be very significant underlying school experience and achievement (Schoenfeld A. , 1985).

Throughout 2011 last trimester the authors conducted *Heuristics in Math Teaching – Tools for Problem Solving*, a fifty hour course to high school teachers at Nova Ágora Educational Center, in Coimbra. In parallel to the workshop, participants were invited to collaborate in an exploratory study focused on ninth grade students' attitudes towards mathematics and their performances concerning mathematical problem solving. Why the focus on them? Because ninth grade students are less than one year far away from starting Secondary Education, a moment when they need to make curricular options with future consequences, both academic and professional. In 2011/2012 school year more than one in four students from ninth grade didn't accomplish success in Math.

Behaviors are consequences of each one's motivations. In a social cognitive perspective, motivation is conceived as a dynamic process with interactions between subject and context regarding individual experiences and perceptions.

With the purpose to identify what explains pupils' attitudes, and their influence, towards Math Problem Solving, the authors have put into practice a questionnaire to be answered by students at the beginning and at the end of school year.

For each question pupils had to choose one of four options of agreement about the degree felt as true to him/herself with the respective statement: Very Much, More or Less, Sometimes and Not Really, scoring 3, 2, 1 and 0 points in Q_1, Q_2, Q_3, Q_4, Q_5, Q_6, Q_7, Q_8, Q_9, Q_{12}, Q_{16}, Q_{17}, Q_{18}, Q_{19} and 0, 1, 2 and 3 points in the remaining items, inversing the scores in the desirable sense, viewed as the attitudes more prompt for successful learning and problem solving.

Questions from the *International Mathematical Kangaroo* have been selected to compare students' performances, in distinct moments. Despite the original multiple choice model, the authors have decided not to present options. In the first term, pupils have been exposed to thirty questions, eighteen more twelve, forty five minutes each, with increasing difficulty level. After data analysis, authors have determined that further tests would only comprehend ten questions, six more four, forty five minutes each. Students replied to

two tests in this design throughout second school term and one in the third term. For investigation purposes the first group of questions has only been considered due the lack of answers concerning problems with great difficulty level. Each answer scores 0 (Blank / Nonsense), 1 (Weak reasoning), 2 (Miss solution due to a minor error), 3 (Correct solution without justification), 4 (Correct solution with justification), 5 (Correct solution with original procedures).

Table 1 – *Items of the Attitudes toward Mathematical Problem Solving Scale conceived for this study*

Q_1 I like doing problem solving.
Q_2 Time spent doesn't matter when I'm trying to find the solution.
Q_3 When I reach a solution I always check my reasoning and calculations.
Q_4 My justifications are well organized to be easily understood.
Q_5 I like when my teacher sees me doing problem solving well.
Q_6 I enjoy solving problems on the board and correcting resolutions.
Q_7 Learning to solve problems can be useful in my daily life / professional future.
Q_8 I believe problem solving is a good mental exercise because I learn to think.
Q_9 When I'm engaged in doing problem solving I like to decide what to do.
Q_{10} I feel embarrassment when I do not know how to solve a problem.
Q_{11} Problem solving makes me anxious.
Q_{12} I read carefully the problem statement.
Q_{13} I should be more swift and effective in problem solving.
Q_{14} I need help to decide what to do.
Q_{15} Mistakes make me bad humorous.
Q_{16} When I have difficulties I know that I can do something to improve.
Q_{17} Before doing any calculation I analyze the problem.
Q_{18} I believe I do problem solving well.
Q_{19} This is a funny activity.
Q_{20} Problem solving is exhausting.
Q_{21} If I realize the question is complex, I give up.
Q_{22} Even when I check the solution I still don't know if it is right or wrong.

All data was organized with SPSS[1] tools. Statistics concerning the questionnaire and *International Mathematical Kangaroo* performances balanced with school year results have help to build a sketch about students' interests and aptitudes.

Educational Psychology dealing with dynamic models, when applied to Problem Solving, combine human factor with the straight laws of Math, giving a chance to extract both content and procedure information for fostering development and learning.

[1] Statistical Package for the Social Sciences.

Thoughts sustained by results

Is mathematics a difficult subject for all students around the globe? PISA[2] outcomes tell us that the answer is no. On average, North European pupils score better results. Why does that happen? What do they have that others don't? Let's reformulate the question. What don't they have that Southern countries got plenty? One straight answer is warm weather and many sunny hours. As emphasized before, Time plays an important role in the process of understanding and doing Math. Why will I stay quietly closed among four walls with my math textbook as companion if outside pleasure calls for me? If in the past I was not able to achieve success in problem solving activity, today I'm certainly doom to failure. Cultural heritage is a not negligible factor. It is not by chance, that the Portuguese word *Fado* doesn't have translation into English. It expresses the idea of destiny embraced in past, present or future pessimism. As a metaphor Portugal still waits the return of Sebastian I, the young king vanished in the 1578 Alcácer Quibir battle. Portuguese greatest achievements are perpetuated in History books, but present and future are waiting to new chapters to be written.

Time five dimensions, Past-Negative, Past-Positive, Present-Hedonistic, Present-Fatalistic and Future-Oriented (Zimbardo & Boyd, 2009) shape people's choices. A Past-Negative perception combined with a Present-Hedonistic attitude jeopardizes a Future-Oriented perspective related Math. Today adolescents have at their disposal an almost infinite number of gadgets, mobile phones with Internet, video games consoles and hundreds of TV channels. All those instruments are attractive, colorful, entertaining, ready to consume, in opposition to pupils' awareness about Math. A more appealing curriculum, put into practice with vividly lessons may hold students attention, but regarding speed it's impossible to go over stages if we want to consolidate and apply knowledge far from routine exercises. Feedback can be quite different among adolescents; those that are Future-Oriented engage and extract, in principle, more from problem solving work than Present-Oriented kids, although the last ones understand the value of mathematical knowledge in their professional and social future. Perseverance, a main factor in problem solving activity, doesn't find much echo among Present-Hedonistic individuals.

In Problem Solving the outcome is only a fraction of the procedure and its significance depends on the question under analysis. Since year 2005 ninth grade students have to do a national final exam. First year results where catastrophic! On average, more than seven upon ten students scored insufficient. To face this chaos, in 2006, the government has started a plan of action with two main vectors: educational courses to teachers and more hours allocated to Mathematics. Since then results have balanced between mediocre and acceptable *(Figure 4)*, due to a set of reasons, namely the exam difficulty level, students/parents/teachers/school dedication, curricular organization, or most likely, all those aspects, and others, combined.

The apparent slow progress helps to answer why the distance between what we know and what we don't know is always beyond of what we can achieve with our velocity of learning, concerning mathematical understanding.

[2] Program for International Student Assessment, focus on 15-years-old students to evaluate capacities in reading literacy, mathematics literacy and science literacy.

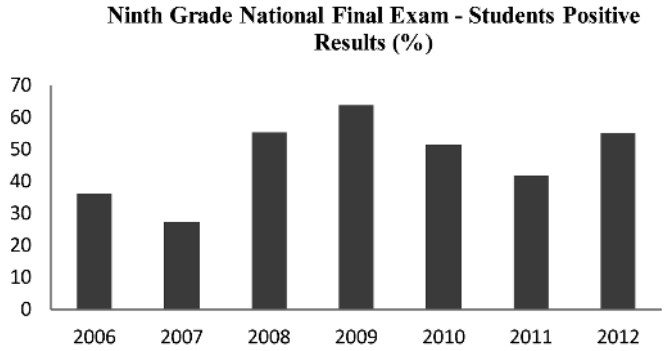

Figure 4

Expertise only comes with time and dedication. If techniques can be hard to master, Problem Solving goes beyond because it requires a more deep thinking. In Math, simplicity and complexity sustain each other as two faces of one coin.

Problem A: What is the value to 13 + 24 + 35 + 46 + 57 + 68 + 79?[3]

Problem B: What is the value to $x - y$, if x = … and y = 13 + 24 + 35 + 20112013?[4]

The previous questions regard number theory but if the first is straightforward, and in appearance, without significance, the last one connects knowledge base, heuristic procedures, metacognition and beliefs (Schoenfeld, 2011, pp. 3-4), a course of action that has been in the genesis of *Heuristics in Math Teaching – Tools for Problem Solving*, a workshop with eighteen high school teachers' participants.

The authors have conducted a study during 2011/2012 school year with a sample composed by 96 youngsters, ninth school year old students, 55 females (54,2%) and 44 males (45,8%) from seven classes, in six public schools from urban areas in the district of Coimbra. The questionnaire regarding problem solving attitudes attends to Schoenfeld model, aiming the assessment of heuristics, resources, control and beliefs. In a global scale,

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[3] In a cut way process student adds the eight parcels. Is he able to use a more efficient strategy, less susceptible to computational error and capable to generate the solution in the shortest time? To do so pupils must have mathematical sensitivity, quality that comes from practice. From the problem analysis emerges that pairs of numbers at the same distance from the extremes generate equal result. From this pattern solution becomes easy to get: 101 + 101 + 101 + 101= 4 × 101 = 404.

[4] What should we do after reading a question difficult to solve? As a marathon racer, problem solving is done step by step, the number of stages used and time needed to accomplish the goal depends on the complexity of the matter and the problem solver's skills.

$x = 1^2 + 2^2 + 3^2 + \ldots + 2011^2 = 1 \times 1 + 2 \times 2 + 3 \times 3 + \ldots + 2011 \times 2011.$

$y = 1 \times 3 + 2 \times 4 + \ldots + 2010 \times 2012.$

$x - y = (1 \times 1 + 2 \times 2 + \ldots + 2011 \times 2011) - (1 \times 3 + 2 \times 4 + 3 \times 5 + \ldots + 2010 \times 2012)$

$= (1 \times 1 - 1 \times 3) + (2 \times 2 - 2 \times 4) + \ldots + (2010 \times 2010 - 2010 \times 2012) + 2011 \times 2011$

$= 1 \times (1 - 3) + 2 \times (2 - 4) + 3 \times (3 - 5) + \ldots + 2010 \times (2010 - 2012) + 2011 \times 2011$

$= 1 \times (-2) + 2 \times (-2) + 3 \times (-2) + \ldots + 2010 \times (-2) + 2011 \times 2011$

$= (-2) \times (1 + 2 + 3 + \ldots + 2010) + 2011 \times 2011$

$= (-2) \times (2011 \times 1005) + 2011 \times 2011 = (2011) \times (-2010) + 2011 \times 2011 = 2011 \times (2011 - 2010) = 2011.$

concerning first term, data reveals 0,787 Cronbach's Alpha internal consistency, when missing values are replaced by the trend.

All items score relevant in the SPSS Item-Total Statistics chart. KMO and Bartlett's Test *(Table 2)* results put on view conditions to perform a factorial analysis.

Table 2 – *KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,758
Bartlett's Test of Sphericity	Approx. Chi-Square	764,732
	df	231
	Sig.	,000

An exploratory factorial analysis was conducted to determinate the most appropriate dimensional structure for the given data set. Exploratory factor analysis was performed using the principal components method (PCA) and Oblimin rotation with the Statistical Program for Social Sciences (SPSS 20®).

The initial results show that the first six components explain approximately 64% of all the variance and each item displays a significant saturation level. Factors have been labeled regarding the structure matrix data and attending to the theoretical model of Schoenfeld *(Table 3)*.

Table 3 – *Factorial structure of the Scale used to assess Attitudes towards Mathematical Problem Solving*

Factors	**Factor Labels**	**Items**
F_1	Beliefs/Motivation	(Q_1, Q_2, Q_7, Q_8, Q_9, Q_{18}, Q_{19})
F_2	External Control	(Q_{13}, Q_{14}, Q_{22})
F_3	Mood	(Q_{10}, Q_{11}, Q_{15})
F_4	Resources	(Q_{20}, Q_{21})
F_5	Heuristics	(Q_3, Q_4, Q_{12}, Q_{16}, Q_{17})
F_6	Knowledge Exhibition	(Q_5, Q_6)

The reliability statistics for each subscale, concerning Cronbach's Alpha, have scored Beliefs/Motivation (0,832), Control (0,615), Mood (0,732), Resources (0,645), Heuristics (0,738) and Knowledge Exhibition (0,383).

Which correlations can be established between factors and the global scale? Statistic data allows identifying multiple connections that underline the complexity of behaviors in

relation to Math Problem Solving. Answers to first term questionnaire put on display a set of those unions, namely, Beliefs/Motivation – Resources, Beliefs/Motivation – Heuristics, Beliefs/Motivation – Knowledge Exhibition, Control – Mood, Control – Resources, Mood – Resources, Heuristics – Knowledge Exhibition. Each one of the six factors is significantly correlated with the total scale.

It is not by chance that Beliefs/Motivation is such a powerful instrument; it captures the idea of success *vs.* failure and perseverance *vs.* renounce, engaging theoretical understanding, tools to do Problem Solving and the will in showing the work done to others. Control skills are linked to disposal and knowledge, undoubtedly the lack of aptitude to deal with emotions can be the source of bad humor, as metacognition helps to organize, open and use what is inside the shelves of information. When I understand what to do I like to do it! The good use of heuristics seems to give confidence allowing the student to share his reasoning with the teacher or colleagues.

Table 4 – *Correlation coefficients between each factor and the total scale*

	F_1	F_2	F_3	F_4	F_5	F_6	Total Scale
F1		---					,752**
F2	,096	---					,324**
F3	,027	,303**	---				,467**
F4	,292**	,285**	,293**	---			,454**
F5	,383**	-,135	-,010	,075	---		,566**
F6	,316**	-,063	,054	-,019	,397**	---	,490**

**. Correlation is significant at the 0.01 level (2-tailed).

Months later, in the course of school year last term, students have been exposed to the same questionnaire. Will there be changes? If so, in what way and why did they occur?

The rank chart allows understanding variations regarding students' attitudes concerning the components presented previously. Surprisingly, or not, in all of them, more pupils have scored worse at the end of school year comparing to those who have increased their performance. The major differences are related to Heuristics, Control and Resources.

The Mean Rank values are found after all data from both questionnaires, related to each component, have been assembled into one column. Then, positions are established from the highest to the lowest and split in two groups, identified as Negative Ranks and Positive Ranks, to compute each one's mean. Despite their progress regarding Beliefs/Motivation and Knowledge Exhibition, students still display inferior Mean Rank. About Control, Mood, Resources and Heuristics the Mean Rank of those who have improved is quite better comparing with the group that has presented worse results in the last term. This seems to underline that it is easier to see progress regarding Beliefs/Motivation and Knowledge Exhibition attitudes in students that initially didn't reveal them, and it is most likely that steps forward concerning Control, Mood, Resources and Heuristics can be done more swiftly among those who were already imbued with them in the first term.

A Wilcoxon test, which evaluates difference between medians, was applied to this repeated-measure design in order to estimate if participants have changed their attitudes.

About the whole sample, Test Statistics *(Table 5)* results show significant differential concerning Control; first term (m=1.19, sd=0,55) / third term (m=1.04, sd=0,40), Mood; first term (m=1.78, sd=0,86) / third term (m=1.60, sd=0,76), Resources; first term (m=1.50, sd=0,76) / third term (m=1.27, sd=0,64) and Heuristics; first term (m=2.21, sd=0,48) / third term (m=2.05, sd=0,49).

Table 5 – *Test Statistics*[a]

	$F_1 3^{rd} Term$ – $F_1 1^{st} Term$	$F_2 3^{rd} Term$ – $F_2 1^{st} Term$	$F_3 3^{rd} Term$ – $F_3 1^{st} Term$	$F_4 3^{rd} Term$ – $F_4 1^{st} Term$	$F_5 3^{rd} Term$ – $F_5 1^{st} Term$	$F_6 3^{rd} Term$ – $F_6 1^{st} Term$
Z	-,320[b]	-2,589[b]	-2,215[b]	-2,780[b]	-2,758[b]	-,995[b]
Asymp. Sig. (2-tailed)	,749	,010	,027	,005	,006	,320

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

The results concerning each one of the six teachers and the seven classes are showed below.

Table 5a – *Test Statistics*[a,b]

	$F_1 3^{rd} Term$ – $F_1 1^{st} Term$	$F_2 3^{rd} Term$ – $F_2 1^{st} Term$	$F_3 3^{rd} Term$ – $F_3 1^{st} Term$	$F_4 3^{rd} Term$ – $F_4 1^{st} Term$	$F_5 3^{rd} Term$ – $F_5 1^{st} Term$	$F_6 3^{rd} Term$ – $F_6 1^{st} Term$
Z	-2,140[c]	-,223[c]	-1,309[c]	-2,046[c]	-2,228[c]	-,035[c]
Asymp. Sig. (2-tailed)	,032	,823	,190	,041	,026	,972

a. Teacher = MAS
b. Wilcoxon Signed Ranks Test
c. Based on positive ranks.

Table 5b – *Test Statistics*[a,b]

	$F_1 3^{rd} Term$ – $F_1 1^{st} Term$	$F_2 3^{rd} Term$ – $F_2 1^{st} Term$	$F_3 3^{rd} Term$ – $F_3 1^{st} Term$	$F_4 3^{rd} Term$ – $F_4 1^{st} Term$	$F_5 3^{rd} Term$ – $F_5 1^{st} Term$	$F_6 3^{rd} Term$ – $F_6 1^{st} Term$
Z	-1,442[c]	-1,915[c]	-,132[c]	-,351[d]	-,305[c]	-1,064[c]
Asymp. Sig. (2-tailed)	,149	,055	,895	,726	,761	,287

a. Teacher = CMM
b. Wilcoxon Signed Ranks Test
c. Based on positive ranks.
d. Based on negative ranks.

Table 5c – *Test Statistics*[a,b]

	$F_1$3rd Term – $F_1$1st Term	$F_2$3rd Term – $F_2$1st Term	$F_3$3rd Term – $F_3$1st Term	$F_4$3rd Term – $F_4$1st Term	$F_5$3rd Term – $F_5$1st Term	$F_6$3rd Term – $F_6$1st Term
Z	-,154[c]	-,470[c]	-1,118[c]	-,862[c]	-1,292[c]	-1,656[c]
Asymp. Sig. (2-tailed)	,878	,639	,264	,389	,196	,098

a. Teacher = CMN
b. Wilcoxon Signed Ranks Test
c. Based on positive ranks.

Table 5d – *Test Statistics*[a,b]

	$F_1$3rd Term – $F_1$1st Term	$F_2$3rd Term – $F_2$1st Term	$F_3$3rd Term – $F_3$1st Term	$F_4$3rd Term – $F_4$1st Term	$F_5$3rd Term – $F_5$1st Term	$F_6$3rd Term – $F_6$1st Term
Z	-,893[c]	-1,802[c]	-,627[c]	-1,527[c]	-2,210[c]	-,702[c]
Asymp. Sig. (2-tailed)	,372	,072	,531	,127	,027	,483

a. Teacher = MMF
b. Wilcoxon Signed Ranks Test
c. Based on positive ranks.

Table 5e – *Test Statistics*[a,b]

	$F_1$3rd Term – $F_1$1st Term	$F_2$3rd Term – $F_2$1st Term	$F_3$3rd Term – $F_3$1st Term	$F_4$3rd Term – $F_4$1st Term	$F_5$3rd Term – $F_5$1st Term	$F_6$3rd Term – $F_6$1st Term
Z	-2,322[c]	-,666[d]	-,000[e]	-,378[c]	-,677[c]	-1,983[c]
Asymp. Sig. (2-tailed)	,020	,506	1,000	,705	,498	,047

a. Teacher = MIG
b. Wilcoxon Signed Ranks Test
c. Based on negative ranks.
d. Based on positive ranks.
e. The sum od negative ranks equals the sum of positive ranks.

Table 5f – *Test Statistics*[a,b]

	$F_1$3rd Term – $F_1$1st Term	$F_2$3rd Term – $F_2$1st Term	$F_3$3rd Term – $F_3$1st Term	$F_4$3rd Term – $F_4$1st Term	$F_5$3rd Term – $F_5$1st Term	$F_6$3rd Term – $F_6$1st Term
Z	-1,429[c]	-2,047[d]	-1,134[d]	-1,136[d]	-1,207[d]	-000[e]
Asymp. Sig. (2-tailed)	,153	,041	,257	,256	,227	1,000

a. Teacher = MFM(A)
b. Wilcoxon Signed Ranks Test
c. Based on negative ranks.
d. Based on positive ranks.
e. The sum od negative ranks equals the sum of positive ranks.

Table 5g – *Test Statistics*[a,b]

	F_1 3rd Term – F_1 1st Term	F_2 3rd Term – F_2 1st Term	F_3 3rd Term – F_3 1st Term	F_4 3rd Term – F_4 1st Term	F_5 3rd Term – F_5 1st Term	F_6 3rd Term – F_6 1st Term
Z	,000[c]	-,600[d]	-1,556[e]	-2,047[e]	-,594[e]	-1,543[e]
Asymp. Sig. (2-tailed)	1,000	,549	,120	,041	,553	,123

a. Teacher = MFM(B)
b. Wilcoxon Signed Ranks Test
c. The sum od negative ranks equals the sum of positive ranks.
d. Based on negative ranks.
e. Based on positive ranks.

Is it odd that values have declined even with the *Heuristics in Math Teaching – Tools for Problem Solving* intervention program? Let's look for clues that can help answering that question.

Since early ages most Portuguese students start developing negative behaviors concerning Math due to causes previously exposed in this paper. When they arrive to ninth grade, prejudice concerning this subject has developed and spread deep roots on learning soil. Regardless of teachers' guidance into Math Problem Solving, that influence is limited because there is a curricular program to accomplish and limited time to do it. On May 10th 2012, students did a national in-between exam before school year national final exam. The ninth grade school population scored, on average, the mediocre result of 31%. Few weeks later, on June 21st 2012, 93435 students did the national exam, now with a medium score of 53%.

If an image can be worth for a thousand words, these numbers are sufficient to illustrate, but not to understand, how complex is the teaching and learning process related to mathematical contents.

Last appointments and first conclusions open to discussion

Math comprehension only came with time. Literature about Problem Solving highlights methodologies that can be used to improve performances; still it is not one *Lapis Philosophorum*. A solid resources package is half way done to achieve success, as embodied on teacher CMM students' results during 2011/2012 school year, where the results are positively correlated with *International Mathematical Kangaroo* questions *(Table 6)*. Last term students' school results are the outcome from the national in-between exam and not from regular internal tests as in the first and second term. This might explain why the correlation value extracted between *IMK* and SSR in the third term (0,365) is not as strong as those observed in first and second term.

The way students engage themselves on Math Problem Solving is the result of multiple components. How to solve them is a never ending journey into cognition fields.

Table 6 – *Correlation Matrix between IMK e SSR**

	IMK 1st Term	*IMK* 2nd Term A	*IMK* 2nd Term B	*IMK* 3rd Term
SSR 1st Term	,559	,493	,690	,480
SSR 2nd Term	,529	,267	,782	,294
SSR 3rd Term	,444	,447	,809	,365

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Chapter 23

The effect of combined mastery-cooperative learning on working memory capacity, self-efficacy and academic achievement in grade skipping

Monir Kalantar Ghoreishi
Flor Rezaei Kargar
Bita Ajilchi
Maryam Kazemlou
Department of Psychology, Faculty of Human Science, Islamic Azad University, Iran
flor.rezaei@gmail.com

Abstract: In this study 25 students of one of the volunteer middle schools of Tehran who were eligible to take grade skipping test were randomly selected and were then examined with working memory capacity test and self-efficacy questionnaire. Then, they participate in a 45-day teaching program for 11 hours a day in summer. The same test and questionnaire given prior to the educational program were re-administered, after the students had completed the educational program and then taken the grade skipping test. These same both tests were administered for a third time, one year later. To examine academic achievement, in the pre-test, the grade point average (GPA) of the first year of the middle school, in the post-test the GPA of the grade skipping exam and in the follow-up the GPA of the third grade of the middle school were taken into account. The repeated measures ANOVA showed a significant increase in working memory capacity and its components, storage and processing, and self-efficacy.

Keywords: cooperative-mastery learning, working memory capacity, self-efficacy, academic achievement.

Introduction

Acceleration is an educational intervention based on progress through an educational program at rates faster or at ages younger than typical (Pressey, 1949). It is ideally suited to academically gifted students — young people who have an enhanced capacity to learn. Acceleration practices provide the appropriate level of challenge and reduce the time necessary for students to complete traditional schooling (NAGC, Position Paper, 1992, cited in Colangelo et al., 2004). There are many forms of acceleration, over than 18 types, that one of them is Grade-skipping or whole-grade acceleration (Colangelo et al., 2004).

Study and research in this field showed that grade skipping for students who are ready, and for whom the process has been carefully considered, can be not only an effective and sound intervention, but better than the alternative, i.e., doing nothing (Colangelo et al., 2004).

In current study, we use a special instruction, combined mastery-cooperative learning, for this mean.

The cooperative learning is one of the educational methods that have attracted the attention of many authors and the relevant studies illustrate its capacity to enhance the access of the students to considerable educational and social progress (Johnson & Johnson, 2002). Cooperative learning consists in a working group of students aiming to achieve one mutual goal using cooperative skills and face-to-face progress feedback (Johnson, Johnson & smith, 1991). In fact, according to some authors it is a process that maximizes the students learning (Johnson et al., 1999).

The extant research showed that cooperative learning has a positive effect on several relevant constructs, such as: educational progress, academic success, long term memories, critical thinking, cognition, higher level reasoning, friendship communications, self-esteem, self-respect, attitude, anxiety and control (Johnson & Johnson, 1989; Artut, 2009; Edrem, 2009).

Some psychologists and trainers believe that learning should be organized in such manner that each student can act and learn to have more academic achievement on the basis of their abilities. In this regard the mastery learning method is suitable. As Gentile (1994; cited in Damavandi et al., 2010) said, mastery learning method includes two systems which derived from different theories but have common learning goals and standards. The first is Keller Personalized System of Instruction that is an individual method in which some large groups are taught. Basis of this system is that development and progress depend on success of the students in doing their homework in the curriculum. The second is the Mastery for Learning Group-Based Approach which was presented in the Carroll learning model (1968; cited in Damavandi et al., 2010) and says that classroom learning is a time-based phenomenon and the longer time of learning lead to the higher rate of learning. This method in comparison with the traditional training, in the different science courses such as physics (Wambugu & Chageiywo, 2008), chemistry (Damavandi et al., 2010), mathematics (Shafie, et al., 2010) has been more successful. The researches have shown that combination of these two methods have completed each other and have more effects on the academic achievements (Baker et al., 1989; Mevareach, 1986) and mental abilities (Krank & Moon, 2001). There are common aspects between cooperating and mastery learning. For instance, evaluation of students and giving scores to them is based on their learning issues and practical abilities, instead of comparing rate of one student with his class mates. Other similarities are flexibility in performing and adaptability with teachers' methods in teaching and class atmosphere (Guskey, 1987).

Working memory is a mental workspace that is responsible for temporary storage and processing of information for performing a range of complicated cognitive tasks such as understanding, reasoning and learning (Daneman et al., 1980). Many researchers have shown that individuals with high working memory capacity exhibit better learning performance because they have more cognitive sources (Daneman et al., 1980; Mossavi et al., 1995).

One of the most effective psychological factors on the academic achievement of students is self-efficacy, a concept that originates on the Bandura's theory of social learning, and consists of self-judgments about the person's capabilities to perform well in specific situations and tasks (Bandura, 1982). Self-efficacy affects goals, levels of motivation, academic achievement and student's attuned believes in learning and access to higher level

studies (Shunck, 2010). Many researchers showed the direct and positive relationships between self-efficacy and academic achievement (e.g. Bandura et al., 1996; Greene et al., 2004; Sharma, 2007; Carroll, 2009).

This study examined the effect of combined mastery-cooperative learning on academic achievement via the effect on working memory capacity and self-efficacy in grade skipping.

Method

Initially from a candidate school in Tehran 25 samples who were eligible to take a grade skipping test [least grade point average (GPA) 18 and least score 15] were randomly selected from female first year students. In the pre-test, the Working Memory Test of Daneman & Carpenter (1980) and the self-efficacy scale of Sherer (1982) were administered to the sample. After that, training sessions have been carried out during 45 continuous days and for several hours each day in summer. The questionnaires were re-administered, after the students had completed the educational program and then taken the grade skipping test. The same tests were administered for a third time, one year later. To examine academic achievement, the GPA of the first year of the middle school, the GPA of the grade skipping exam, and the GPA of the third grade of the middle school were taken into account. Data were analyzed by one way ANOVA analysis with repeated measure ($p< 0.05$).

Working memory test of Daniman & karpenter (1980)

This test has a series of dual-tasks which required simultaneous processing and storage of information. The processing task for reading–span is to read a series of sentences, while the memory task is to recall the last word in each sentence. The correlation of this test with a verbal aptitude test is 0.59, with a special comprehensive test is 0.72, and with indicate pronouns test is 0.90 (Daniman & Karpenter, 1980). Reliability coefficient was 0.88, in one pilot study thathave been done on eighty four students (Asadzadeh, 2004).

Sherer et al. self-efficacy scale (GSE, 1982)

This test has 23 items of which 17 items evaluate general self-efficacy. The responses are made according to a Likert-type scale (from absolutely agree to absolutely disagree). The general score of this questionnaire correlates with several other measures, such as scores of internal locus of control, internal competence, self-esteem, and assertiveness. In terms of reliability (internal consistency) a Cronbach alpha 0.80 was achieved.

Results

According to Table 1, scores of working memory capacity, storage, processing, and self-efficacy have increased.

Table 1 – *Descriptive statistics for variables*

Variables	Pre-test		Post-test		Follow up	
	Mean	Sd	Mean	Sd	Mean	Sd
Working memory capacity	104.42	21.57	123.52	16.50	121.87	18.93
Storage	44.60	12.20	53.32	9.20	53.58	7.60
Processing	59.83	14.57	70.20	11.88	68.30	16.60
Self-efficacy	55.88	10.17	66.08	6.52	66.72	6.33
Academic achievement	19.12	0.70	19.00	0.54	18.94	0.90

Note. Sd. = Standard deviation

Table 2 – *One way Analysis of variance with repeated measure for variables*

Effect	Value	F(2,23)	P <	Effect size
Working memory capacity	0.441	14.55	0.001	0.559
Storage	0.558	9.12	0.001	0.442
Processing	0.527	10.31	0.001	0.473
Self-efficacy	0.248	38.82	0.001	0.752
Academic achievement	0.793	4.73	0.070	0.207

Note. F values gained by Wilks´ Lambda.

Table 3 – *Means comparison*

Variables	Md	P <	Md (2,3)	P <	Md (1,3)	P <
Working memory capacity	19.10	0.001	1.65	1.00	17.45	0.001
Storage	8.73	0.002	0.26	1.00	8.99	0.001
Processing	10.37	0.001	1.91	0.80	8.46	0.030
Self-efficacy	10.20	0.001	0.64	0.505	10.84	0.001
Academic achievement	0.36	0.317	0.04	1.00	0.18	0.150

Note. Md = Deferential mean, 1 = pre-test, 2 = post-test, 3 = follow up.

As it is observed in Table 2, statistically significant differences (p<0.05) were obtained for the majority of the observed variables, namely working memory and its components (storage and processing) and self-efficacy. The means show that this significant difference has resulted from increasing post-test scores of these variables. Effect sizes of working memory, storage, processing, and self-efficacy are 0.559, 0.442, 0.473, and 0.752, respectively. In accordance with the Cohen's guidelines (1988) that introduce small effect size of 0.01, medium effect size of 0.06 and large effect size of 0.14, the above-mentioned effect sizes are large and show major impact of training on the variables.

As it is clear in Table 3, differences between the means of pre-test and post-test in test working memory capacity and its components (Storage and Processing) and self-efficacy are significant. The results show that in the post-test, the means of these variables have increased (cf. with Table 1 figures). The differences between means (post-test and follow up) aren´t significant for any of the measured variables, which shows stability of results after one year.

Discussion & Conclusion

The aim of this study was to investigate the effect of combined mastery-cooperative learning on working memory capacity, self-efficacy and academic achievement in grade skipping from first grade to third grade of middle school. From our data it is clear that test working memory capacity and its components (storage and processing), and self-efficacy have significantly increased with the training provided to the student´s. Significant change has not been reached in academic achievement during the time allotted to the study. This issue does not mean that this method has no impact on this variable; probably the stress and strain that accompanies the move to a upper academic grade (with a concomitant hardness of study lessons compounded by higher levels of mental problems, such as anxiety due to changing in current situation), has been accompanied by an educational drop.

One of outcomes of current study is the positive effect of this method on working memory capacity that occurs by enhancing the amount of information storage and the improved quality of the students information processing. Many researchers on instruction found that mastery and cooperative learning positively affect memory and not only increase space of memory by omitting unrelated information and dysfunctional behaviors and emotions such as individual competition, anxiety, etc. (Guskey, 1987; Gillies & Ashman, 1998; Johnson & Johnson, 2002; Gillies, 2003; Shellhase, 2008) but also improve processing of information related to task in hand and by this way increase working memory capacity.

These results about direct effect of this method on academic achievement are consistent with previously published research by Baker, King and Wulf (1989), Mevareach (1986a, b) and Krank and Moon (2001).

It seems that one of the factors associated with the promotion of academic progress can be working memory capacity enhancement that occurs via the increment of storage and processing capabilities. This result is similar to the other research studies that showed that an increase in working memory capacity leads to achievement in many courses and causes academic achievement. Accordingly, our findings are in line with findings of Grimley et al. (2008), Alloway and Alloway (2010), Raghubar et al. (2010), Daneman & Carpenter (1986) and Mossavi et al. (1995).

Furthermore, improvement of self-efficacy in students is another factor that can lead to academic achievement. This assumption is based on studies that revealed that when self-efficacy of students is increased academic achievement is also increased. In line with this result we can mention the studies carried out by Bandura et al. (1996), Chemers et al. (2001), Valentine et al. (2004) and Carroll et al. (2009).

The present research is innovative and relevant for several reasons. At an individual level it can be exciting for some students who seem to be future oriented and feel compe-

tent, to be able to more rapidly progress in their educational path. It can be important to the families also because skipping a grade (or more) leads to a reduction in the duration of training and of all associated tuition costs. Finally for society, mainly in poor provinces (and countries) it can be used to optimize the existing resources, especially by promoting motivation and cognitive skills that have a strong and positive impact in the students learning progress.

For the proper generalization of these results this research should be replicated with other students attending other schools and also other grades and educational levels.

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Chapter 24

Effect of teaching creative and critical thinking skills on defense styles and mental health in adolescents

Flor Rezaei Kargar
Bita Ajilchi
Monir Kalantar Ghoreishi
Department of Psychology, Faculty of Human Science, Islamic Azad University, Iran
flor.rezaei@gmail.com

Abstract: Adolescence is an essential period in life course which in mental health is at risk. On the other hand, defense mechanisms that are indicators of mental health have important role in this issue. It seems that promotion of thought can impress these variables. In this regard, the purpose of this study was to examine the effect of teaching creative and critical thinking skills on defense styles and mental health in adolescents attending high school. In an experimental study 40 students who were selected using random multilayer sampling, were divided into two test and control groups and responded to DSQ-40 and GHQ in group form. Then, the test group received 10 educational sessions (20 hours) focusing on thinking skills (creative and critical). The control group didn't receive any kind of intervention. Upon completion of educational sessions, both groups were retested with questionnaires of critical and creativity thinking, thinking. Independent t-tests showed significant increases in creativity and critical thinking in the experimental group. Furthermore, MANCOVA showed significant increases in mature defense style (and all of its mechanisms) and on general mental health. Additionally, a significant decrease were seen in somatic symptoms, anxiety and insomnia, and severe depression in experimental group.

Keywords: creative thinking, critical thinking, defense style, mental health.

Introduction

Today, modernity and technology cause many changes in life that can be strong sources of stress for people in general. This issue is very important for young people because adolescence is an essential period in life course in which mental health can be put to risk, especially in the absence of mature coping skills necessary to face adversity (Kessler, Berglund, Demler et al., 2005).

In order to cope with stress and maintain mental balance, defense mechanisms play an important role (Bond & Perry, 2004). Indeed, defense mechanisms are unconscious processes (to avoid anxiety and protect the ego)are activated in threatening situations (Cooper, 1998; Freud, 1936) and that can also be seen as indicators of mental health (Feldman, Araujo, & Steiner, 1996).

Andrews and colleagues (1989) classified defense mechanisms into three categories: mature (adaptive), neurotic, and immature defense styles (the two latter are maladap-

tive). Researchers have confirmed the relations between maladaptive defense mechanisms and psychiatric symptoms (e.g. Sarno et al., 2010). Therefore, the promotion of adaptive defense styles and and the concomitant inhibition of maladaptive ones (Freud, 1894; cited in Zigler-Hill et al., 2008) is a key factor in improving mental health.

The findings of Ivans and Seeman (2000) support the theory that defense mechanisms development is based on the ego maturing levels. Since the ego is the location of cognition and intellect, the promotion of cognitive processes and thought functions can lead to ego development and consequently the use of adaptive defense mechanisms can increase mental health (Cramer, 2006; Chavez-Eakle, Lara, & Cruz-Fuentes, 2006; Settersten & Lauver, 2004).

It is clear that thinking skills are key components of cognition and thought. According to the classification of thinking skills made by Swartz and Parks (1994, cited in Burk & Williams, 2008), creative and critical thinking are central cognitive capabilities. Creative thinking process involves the ability to produce original ideas, to perceive new and unsuspected relationships, or to establish a unique and improved order among seemingly unrelated factors (Piaw, 2010). Many scholars (Paul & Elder, 2005; Giancarlo, Blohm & Urdan, 2004; Silverman & Smith, 2002; Glaser, 1985; cited in Piaw, 2010) have viewed critical thinking as the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action.

In this regard, in this study we want to examine the effect of teaching creative and critical thinking skills on defense styles and mental health of adolescents attending high school.

Method

Participants

Forty male students attending the 6th degree (fifteen years old) in one high school in Tehran that was selected using random cluster sampling method were divided into two test and control groups by random assignment. Then, the participants responded to questionnaires defense styles and general mental health. Later, the test group received 10 educational sessions (20 hours, one session per week) focusing on the teaching of creative and critical thinking skills. Finally, both groups responded to a critical thinking skills test, a creativity inventory and the questionnaires used of pre-test.

Instruments

California Critical Thinking Skills Test form B (CCTST). It is a multiple-choice instrument that consists of six subscales including analysis, evaluation, inference, explanation, interpretation, and self-regulation. The internal reliability was computed (it oscillated between 0.78 and 0.84). Validity was measured by correlating the CCTST with the Scholastic Aptitude Test verbal scores (correlation of 0.55) (Facione, 2006).

Abedi- Scumacher creativity Test (O`Neil, Abedi and Spielberger, 1994). It is a multiple choice test comprising 60 questions in which students rate themselves on a three-point scale. It measures fluency, flexibility, originality, and elaboration. Azumendi, Villa and Abedi (1996; cited in Cropley, 2005) reported internal reliability of 0.61 to 0.75 for the four subscales.

Questionnaire of defense style DSQ-40 (Andrews, Sing & Bond, 1993). This scale has 40 items corresponding to twenty defense mechanisms (two items for per mechanism), categorized in 3 defense styles: mature defense style, neurotic defense style, and immature defense style.. Reported Cronbach alpha for the original scales are satisfatory (Andrews et al., 1993). Cronbach alpha's for the Persian version, used in the present study, obtained in a student sample were respectively 0.75, 0.73, and 0.74. The test-retest coefficient after four weeks was 0.82 (Besharat et al. 2001).

The General Health Questionnaire, GHQ-28 (Goldberg, 1972). It consists of 28 items; the higher the score the lower the psychological well-being. It provides four sub-scales respectively tapping somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. Test-retest reliability has been reported to oscillate between 0.78 and 0.90 (Robinson & Price, 1982; cited in Sterling, 2011); Cronbach's α oscillate between 0.90-0.95 (Failde and Ramos, 2000; cited in Sterling, 2011).

Results

Table 1 – *Descriptive statistics of variables*

		Experimental group		Control group	
	Group	Mean	SD	Mean	SD
Mature defense style	Pre test	46.10	9.47	50.75	11.92
	Post test	50.75	11.92	45.55	6.93
Neurotic defense style	Pre test	44.95	10.56	48.95	8.80
	Post test	48.15	9.99	45.5	6.93
Immature defense style	Pre test	124.3	25.91	130.8	23.88
	Post test	120.9	28.56	127.5	22.25
General health	Pre test	28.05	11.51	28.60	10.02
	Post test	24.65	7.93	29.15	11.36
Somatic health	Pre test	5.20	3.38	5.60	3.56
	Post test	4.45	3.68	6.35	3.91
Anxiety and insomnia	Pre test	4.90	4.28	5.40	3.26
	Post test	1.70	2.23	5.10	4.48
Social dysfunction	Pre test	14.55	2.63	14.10	2.95
	Post test	14.75	3.39	13.10	3.82
Severe depression	Pre test	3.25	5.49	3.65	4.67
	Post test	2.05	2.89	4.65	7.07

Table 1 showed that mature defense style increased but neurotic defense style, immature defense style, general health and its components decreased in experimental group.

Table 2 – *Independent T-Test for creative and critical thinking between experimental and control groups*

	Experimental group		Control group			
	Mean	SD	Mean	SD	t(38)	P <
Creative thinking	89.75	16.97	79.90	18.23	2.77	.001
Critical thinking	10.80	2.35	7.60	2.76	3.95	.005

Table 2 showed that creative and critical thinking significantly increased in experimental group after teaching.

Table 3 – *Defense style differences before and after teaching*

Source	Dependent Variable	Sum of Squares	Mean Square	F(1,35)	P <	Effect Size
Group	Post test for Mature Defense style	695.83	695.83	10.12	.003	.224
	Post test for Neurotic Defense style	169.72	169.73	2.54	.120	.068
	Post test for Neurotic Defense style	152.87	152.87	0.356	.554	.010
Error	Post test for Mature Defense style	2406.67	68.76			
	Post test for Neurotic Defense style	2341.75	66.91			
	Post test for Neurotic Defense style	15012.18	428.92			
Total	Post test for Mature Defense style	96618.00				
	Post test for Neurotic Defense style	90672.00				
	Post test for Neurotic Defense style	642366.00				

The results of the MANCOVA (see Table 3) show that the mature defense style increased in posttest in the experimental group (after the teaching sessions). Effect sizes of this variable are 0.224. Using Cohen's instructions (1988) suggesting that large effect sizes are higher than 0.14, it can be concluded that the effect size observed in this study is in that range.

On the other hand the MANCOVA results obtained in the mental health indicators (see Table 4) point out that the scores of general health, somatic symptoms, anxiety and insomnia, and severe depression significantly decreased in posttest in the experimental group (after the teaching sessions). Effect sizes for these variables are respectively 0.124, 0.109, 0.248 and 0.114, expressing medium to large effect sizes.

Table 4 – *General health differences before and after the training program*

Source	Dependent Variable	Sum of Squares	Mean Square	F (1,33)	P <	Effect Size
Group	Post test of general health	166.912	166.912	4.669	.038	.124
	Post test of somatic symptoms	33.017	33.017	4.046	.050	.109
	Post test of anxiety and insomnia	98.633	98.633	10.864	.002	.248
	Post test of social dysfunction	25.667	25.667	2.141	.153	.061
	Post test of severe depression	74.056	74.056	4.226	.048	.114
Error	Post test of general health	1179.721	35.749			
	Post test of somatic symptoms	269.289	8.160			
	Post test of anxiety and insomnia	299.611	9.079			
	Post test of social dysfunction	395.535	11.986			
	Post test of severe depression	578.293	17.524			
Total	Post test of general health	32794.000				
	Post test of somatic symptoms	1750.000				
	Post test of anxiety and insomnia	1054.000				
	Post test of social dysfunction	8279.000				
	Post test of severe depression	1626.000				

Discussion & Conclusion

This study indicated that creative and critical thinking skills as well and mature defense style increased after the teaching sessions. This finding is consonant with Ivans and Seeman (2000), and also Cramer (2006) studies, that argued that adaptive defense styles can be enhanced by improving the ego functions. While defense mechanisms are generally conceived as unconscious processes (Freud, 1996; Cramer, 2006), this study evidenced that they are subjected to change via the manipulation of conscious cognitive processes.

Furthermore, this study showed that teaching creative and critical thinking skills also promote mental health. This finding is in line with Krystal (1988), Parisooz (2011), Khandaghi and Pakmehr (2011) studies, which produce evidence that critical thinking skills and mental health indicators are mutually related.

Studies carried out respectively by Schwarzkopf (1981), Hermann (1987), Shubert (1988), Krystal (1988), Chavez-Eakle, Lara, & Cruz-Fuentes (2006), Khosravani and Gilani (2007), Ourang, Azad Fallah and Dezhcam (2010) have reached similar conclusions.

Indeed, when someone uses creative and critical thinking skills, he/she is involved in healthy behaviors (Settersten & Lauver, 2004), such as, adaptive decision making, and consequently diminishes the possibility of experiencing ill-being, such as despair, somatic symptoms, anxiety and depression.

In conclusion, it can be said that teaching creative and critical thinking skills contributes to the reduction of problems and difficulties in the adolescents.

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PART 6

MEASUREMENT AND EMERGING TOPICS IN TIME PERSPECTIVE

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Chapter 25

Testing the Zimbardo Time Perspective Inventory: Japanese validation study

Kiyoshi Takahashi
Kobe University, School of Business Administration, Japan
ktakahas@kobe-u.ac.jp

Masamitsu Shimane
Meikai University, Japan

Yoshio Ono
Kansai University, Japan

Yasuhiro Hattori
Shiga University, Japan

Abstract: The concept of time perspective has received wide acceptance in both academic and practitioner literatures since Zimbardo and Boyd published their seminal work in 1999. The number of time perspective studies has grown tremendously during the past 10 years. Although time perspective in non-Western contexts is crucial to describe human personality, much of the existing research has relied primarily on Western samples. The purpose of this study is twofold. First, reliability and validity of the Zimbardo Time Perspective Inventory (ZTPI)–Japanese version are investigated. Data collected from 1,063 Japanese workers is factor-analyzed to confirm the underlying structure of the ZTPI-J. The results found that the underlying structure for the Japanese samples was similar to the original factorial structure reported by Zimbardo and Boyd. Second, this study scrutinizes the effects of five perspectives, i.e. Past-negative, Past-positive, Present-hedonistic, Present-fatalistic, and Future, on job satisfaction, organizational commitment, intension to quit, career orientation, leadership, and organizational citizenship behavior. All five subscales were found to have significant relationships to these criteria. This study suggested the applicability of this popular measure for time perspective to the Japanese business persons.

Keywords: ZTPI-Japanese version, reliability, validity, job satisfaction, career orientation.

Introduction

Time perspective is an important area of research for investigating a variety of human behaviors. Its major foci have been placed on the research in educational and clinical psychology. For example, researchers have found relationships between time perspective and academic achievement (e.g., Barber, Munz, Bagsby, & Grawitch, 2009; Joireman, 1999), the use of substances (e.g., Daugherty & Brase, 2010; Keough, Zimbardo, & Boyd, 1999), and depression and suicidal ideation (e.g., Laghi et al., 2009; Pluck et al., 2008). Despite

the fact that time perspective has an explanatory power for job-related construct such as self-efficacy, planning, and goal-oriented attitudes, industrial psychologists have paid scant attention to this important notion that can describe how individuals conceptualize and value their experiences in the temporal frame of past, present, and future.

Since the introduction of the Zimbardo Time Perspective Inventory (ZTPI: Zimbardo & Boyd, 1999), researchers all over the world have translated this inventory into different languages and tested the underlying structure of the scale empirically (e.g., Czech version, Lukavska, Klicperova-Baker, & Lukavsky, 2011; French version, Apostolidis, Fieulaine, & Soule, 2006; Italian version, Leghi et al., 2009, Lithuanian version, Liniauskaite & Kairys, 2009; Swedish version, Carelli, Wiberg, & Wiberg, 2011; and Brazilian version, Milfont et al., 2008). The review of these international studies generally found that the translated ZTPI showed the five-factor structure similar to the original model (i.e., past negative, past positive, present fatalistic, present hedonistic, and future). Therefore, it is safe to say that ZTPI is robust to measure five temporal frames even it is translated into other languages. According to the culture-bound nature of tests, however, it is necessary to examine psychometric properties such as reliability and validity if the scale is applied to the new nation with a different language.

The purpose of the present study is twofold. First, this study aims to provide evidence of the reliability and validity for the ZTPI Japanese version with data collected in industrial settings. Second, the present study follows the exploratory factor analytic procedure conducted in the original study (Zimbardo & Boyd, 1999) to test whether the five-factor model is applicable to the Japanese samples.

Method

Participants

Data was collected from Japanese business persons who are registered to a major internet survey company. Research suggests that using on-line surveys is generally acceptable to survey participants and does not impact data quality when compared with paper-and-pencil surveys (Church, 2001). We recruited respondents through a Japanese internet survey company, an organization which maintains a large database of individuals willing to participate in on-line surveys. The company sent a link to our survey (URL) to Japanese business persons who volunteered to participate in the study. A total of 1,063 Japanese respondents agreed to participate in this data collection. Sexes of participants were controlled to be even, with the composition of 49.8 percent male and 50.2 percent female. Participants ranged in age from 20 to 59 with an average of 39.8 years (*s.d.*=10.4). There was no age discrepancy between gender groups: Average age of males is 40.1 (*s.d.*=10.4) and of females is 39.5 (*s.d.*=10.5). Composition of age groups were also controlled so as to occupy equal proportions: 20's (24.7%), 30's (25.0%), 40's (24.8%), and 50's (25.4%).

Levels of education were generally high such that more than half of the participants held a college degree. 25.6 percent received high-school education or lower, 21.1 percent with junior college education, 47.4 percent with four-year college degree, and 5.3 percent with post-graduate education.

Most participants were rank-and-file employees (69.1%), yet a fairly large number of management-level employees contributed to the data collection: lower management (15.8%), middle management (6.4%), senior management (3.7%), and executives (5.0%).

The levels of annual income were scattered: 3 million yen (US$ 37,500; $1=80 yen) or less (36.9%), 3 to 5 million yen (US$ 37.500 to 62,500; 36.4%), 5 to 7 million yen (US$ 62,500 to 87,500; 14.9%), and 7 million yen (US$ 87,500) or more (11.9%).

Measures

All participants were asked to respond to the Zimbardo Time Perspective Inventory-Japanese version (ZTPI-J) that was translated by Shimojima (2010). Fifty-six items were included in an identical sequence to the original scale. In line with the original version, the ZTPI-J asks respondents to indicate how characteristic a statement is of them on a 5-point Likert scale, ranging from (1) *very uncharacteristic* to (5) *very characteristic*. Reliability of the ZTPI-J is investigated from the internal consistency approach by calculating Cronbach's alpha coefficients for each subscale.

The criterion-related validity is examined by the sizes of correlation coefficients between ZTPI-J subscales and the following outcome variables measured on the five-point Likert scales: Job satisfaction (5 items, *M*=2.78, *s.d.*=.94, alpha=.851); organizational commitment (6 items, *M*=3.11, *s.d.*=.86, alpha=.861); intention to quit (3 items, *M*=3.38, *s.d.*=1.09, alpha=.774); career orientation (3 items, *M*=2.45, *s.d.*=1.00, alpha=.839); leadership behavior (6 items, *M*=2.96, *s.d.*=.80, alpha=.847); and organizational citizenship behavior (OCB: 8 items, *M*=3.26, *s.d.*=.74, alpha=.869).

The hypothesized five-factor structure is tested empirically by following the same factor-analytic procedure taken by Zimbardo and Boyd (1999). Specifically, the present study runs a principal-component analysis with varimax rotations for testing the reproduction of subscale loading patterns for the Japanese industrial data.

Results

Table 1 showed the reliability of the ZTPI-Japanese version. Cronbach's alpha coefficients were moderately high and acceptable as proof of reliable scales. Alpha coefficients ranged in size from .689 (Past Positive) to .789 (Past Negative), with an average of .726. As compared with the original reliabilities (e.g., Past Negative alpha=.82; Present Hedonistic alpha=.79; Future alpha=.77; Past Positive alpha=.80; Present Fatalistic alpha=.74 based on 361 student samples), those for the Japanese version were slightly lower.

The present study tried to validate ZTPI-J subscales by correlating them with outcome variables that were frequently researched in industrial settings. Right columns in Table 1 exhibited correlation coefficients against six popular criteria. Overall, ZTPI found significant validity coefficients with diverse criteria. Specifically, Past Negative (PN) was correlated significantly with all six variables. Interestingly, PN was related negatively with positive outcome variables (i.e., job satisfaction *r*=-.243; organizational commitment *r*=-.209; career orientation *r*=-.093; leadership *r*=-.137; and organizational citizenship

behavior *r*=-.143), while a positive correlation was observed to the negative criterion (i.e., intention to quit *r*=.243).

Present Hedonistic (PH) showed significant positive correlations against all six variables. Among others, PH had the strongest association with leadership behavior (*r*=.301). This may be that because PH is characterized by impulsive and risk-taking attitudes, and individuals who have PH orientation are more likely to take leadership behavior in the situation where collectivistic and harmonious norms are salient. In other words, since leadership in this study focused on visionary/transformational behavior that emphasizes risk-taking attitudes in respondents, the relationships between PH and leadership may be magnified to some degree.

Similarly, Future (F) was associated significantly with all variables. It was intuitive that the planning and goal-orientated nature of F would have positive correlations with job satisfaction (*r*=.125), organizational commitment (*r*=.214), career orientation (*r*=.214), leadership (*r*=.262), and organizational citizenship behavior (*r*=.371), while showing negative correlation with intention to quit (*r*=-.098).

Past Positive (PP) found moderate positive correlations with four positive criteria (i.e., job satisfaction *r*=.112; organizational commitment *r*=.122; leadership *r*=.145; and organizational citizenship behavior *r*=.100). However, PP did not have statistically meaningful connections to career orientation and turnover.

Similar to the patterns of PN, Present Fatalistic (PF) exerted negative influences on positive criteria (i.e., job satisfaction *r*=-.119; organizational commitment *r*=-.155; leadership *r*=-.096; organizational citizenship behavior *r*=-.101) and a positive effect on intention to quit (*r*=.111), though the magnitude of effects were lower than those of PN.

Table 1 – *Reliability and validity coefficients of ZTPI-J (n*= 1063*)*

ZTPI-J Factors	Mean	s.d.	Cronbach alpha	Criterion Variables					
				Job Satis-faction	Organization Commitment	Intention to Quit	Career Ori-ent.	Leadership	OCB
Past Negative	3,11	,66	,796	-.243***	-.209***	.243***	-.093**	-.137***	-.143***
Present Hedonistic	3,20	,46	,736	.080**	.153***	.088**	.205***	.301***	.177***
Future	3,45	,46	,717	.125***	.214***	-.098**	.214***	.262***	.371***
Past Positive	3,27	,57	,689	.112***	.122***	-.020	.023	.145***	.100**
Present Fatalistic	2,89	,54	,692	-.119***	-.155***	.111***	-.046	-.096**	-.101***

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

In order to make a comparison of factor structures between original ZTPI and ZTPI-J, the present study replicated an exploratory principal-components factor analysis of a five-factor solution with varimax rotations. Table 2 revealed that ZTPI-J's five factors explained 35.0 percent of the total variance. Because Zimbardo & Boyd's exploratory factor analysis

accounted for 35.9 percent of variance, the Japanese version was proved to have the equivalent exploratory power for the individual's temporal frame among Japanese people.

Inspection of factor loadings revealed that ZTPI-J items were loaded on the hypothesized factors successfully (bold in Table 2). However, the order of factor extraction disagreed with the original. Past Negative appeared as the first factor, as expected, followed by Future, Present Hedonistic, Present Fatalistic, and Past Positive. Despite the difference in the order of factor extraction, Table 2 suggested that ZTPI-J possessed theoretically justifiable factor structures as well as psychometrically sound properties.

Table 2 – *Exploratory factor-analytic results for ZTPI-J*

ZTPI item	Original Principal Comp. Analysis (Zimbardo & Boyd, 1999)					Principal Comp. Analysis (Japanese ZTPI, *n*= 1063)				
	Past Negative	Present Hedonistic	Future	Past Positive	Present Fatalistic	Past Negative	Future	Present Hedonistic	Present Fatalistic	Past Positive
1	,07	**,42**	-,02	,14	-,10	-,05	,11	,26	-,22	,43
2	-,08	,18	,06	**,62**	,02	,17	,17	,15	-,01	**,49**
3	,24	,19	,09	,14	**,44**	,13	,01	-,01	**,60**	,12
4	**,66**	-,01	-,07	,05	,15	**,65**	-,08	-,09	,13	,27
5	**,41**	,00	,02	,23	,18	,16	-,05	,06	,17	,23
6	,08	-,16	**,46**	,10	,02	,04	**,46**	,13	,08	,00
7	-,25	,14	,01	**,68**	-,02	,06	,00	,03	,03	**,70**
8	,03	**,51**	-,27	-,10	,05	,24	-,27	**,54**	,08	,16
9*	-,09	,21	**-,33**	-,08	,12	-,36	-,09	,43	,24	-,09
10	-,16	,13	**,56**	-,03	-,09	,01	**,63**	,13	-,19	,04
11	-,41	,06	,03	**,63**	-,12	-,42	,06	,18	-,07	**,50**
12	,09	**,32**	-,04	,13	,22	,08	,17	**,26**	,16	,25
13	-,08	-,17	**,63**	,04	,10	,09	**,54**	-,18	,01	-,06
14	,10	,04	-,15	-,07	**,64**	,19	-,22	-,03	**,64**	,02
15	,18	,09	,09	**,63**	,06	,17	,06	,04	,23	**,47**
16	**,69**	,16	-,01	-,18	,06	**,74**	,04	-,02	,17	-,04
17	-,20	**,50**	,19	,11	-,06	-,09	,48	,37	,00	,07
18	,11	,04	**,48**	-,06	-,04	,05	**,44**	-,14	-,03	,11
19	,05	**,38**	,12	,10	,07	,04	,23	,24	,27	,01
20	-,24	,24	,11	**,64**	-,03	-,11	,12	,17	-,03	**,59**
21	-,12	,04	**,46**	,17	-,04	-,10	**,57**	,04	-,10	,14
22	**,49**	,24	,07	-,20	-,04	**,36**	,01	,16	,27	-,27
23	,07	**,51**	-,25	-,12	,13	,23	-,35	**,41**	,17	,15
24*	,06	,28	**-,49**	-,11	,20	,18	**-,51**	,23	,29	,03
25*	,55	-,02	,02	-,52	,21	,60	,00	,02	,35	-,31
26	,05	**,56**	,05	,18	-,14	,08	,15	**,57**	-,23	,16
27	**,55**	,03	-,18	,05	,02	**,58**	-,08	,15	-,02	,02
28	,00	**,36**	-,30	,06	,33	-,12	-,05	**,40**	,21	,10
29	,04	,06	-,02	**,64**	,21	,29	-,05	,02	,03	**,66**

ZTPI item	Original Principal Comp. Analysis (Zimbardo & Boyd, 1999)					Principal Comp. Analysis (Japanese ZTPI, *n*= 1063)				
	Past Negative	Present Hedonistic	Future	Past Positive	Present Fatalistic	Past Negative	Future	Present Hedonistic	Present Fatalistic	Past Positive
30	,08	,03	**,37**	,16	-,29	,17	**,38**	-,12	-,05	,18
31	,00	**,70**	-,02	,00	,03	,06	,16	**,60**	,00	-,01
32	-,13	**,45**	-,08	,08	,15	-,15	,27	**,36**	-,14	,12
33	**,43**	,04	-,17	-,08	,29	**,52**	-,09	,00	,26	-,08
34	**,67**	-,01	,05	-,25	,07	**,68**	,01	-,01	,13	-,06
35	,20	,16	-,20	-,09	**,42**	**,28**	-,02	,07	**,35**	,03
36	**,47**	,08	,06	,24	,21	**,52**	,02	,07	,19	,22
37	,14	,17	-,12	-,04	**,59**	,11	-,07	,02	**,59**	,00
38	,17	-,02	,06	,02	**,73**	,26	-,02	-,07	**,61**	,05
39	,04	-,02	-,01	-,10	**,68**	-,14	-,04	,19	**,44**	-,11
40	-,17	-,02	**,61**	-,01	,04	-,03	**,56**	-,08	,09	,08
41*	,00	,00	,00	**-,45**	,25	,16	,00	,18	,32	-,30
42	,00	**,71**	-,01	-,04	,08	,08	,15	**,67**	-,07	,05
43	-,05	,07	**,45**	,07	-,05	,04	**,50**	,15	-,05	,04
44	,18	**,45**	-,10	,07	,12	,13	-,18	**,41**	,21	,15
45	-,16	-,09	**,61**	-,06	-,06	-,18	**,56**	,00	-,02	,06
46	,16	**,44**	-,22	,23	,10	,29	-,15	**,37**	,14	,08
47	,20	-,09	,00	,09	**,42**	,26	,06	,01	**,30**	,21
48	-,04	**,45**	-,16	-,10	,18	,00	-,21	**,37**	,25	,08
49	,10	-,06	,11	**,47**	-,03	-,20	,17	,09	,03	**,44**
50	**,76**	,06	,06	-,08	,05	**,71**	,05	-,03	,02	,09
51	,09	-,07	**,51**	,01	-,08	-,15	**,52**	,32	-,15	-,05
52	-,05	,28	-,18	-,04	**,34**	-,11	-,17	,39	,26	-,10
53	,08	,14	-,11	,02	**,45**	,19	-,11	,10	**,52**	,03
54	**,63**	-,07	-,13	,01	,21	**,49**	-,06	,11	,10	,37
55	,20	**,44**	,00	,07	-,02	,05	,10	**,47**	-,05	,20
56*	-,11	,29	**-,36**	,09	,10	-,22	,03	,35	,23	,00
eigen value	6,86	5,01	3,54	2,50	2,21	6,57	4,87	3,56	2,63	1,95
% explained	12,3	8,9	6,3	4,5	3,9	11,7	8,7	6,4	4,7	3,5

Discussion

The aim of this study was to examine the reliability and validity of the Japanese version of the ZTPI, and to investigate its factor structure in the sample of Japanese workers.

Results found that ZTPI-J exhibited reasonably high internal consistency and high validity with six outside criteria, including job satisfaction, organizational commitment, intention to quit, career orientation, leadership, and organizational citizenship behavior.

In addition, results of exploratory factor analysis indicated that the five-factor structure proposed by Zimbardo and Boyd (1999) had a fit to the data collected from Japanese industrial participants, providing statistical evidence for a justifiable factor structure, confirmative loading patterns, and a significant explanatory power. Therefore, the present study was able to give empirical support for testing the applicability of ZTPI in international, industrial settings.

Regarding its applicability to an industrial sample, Ryack (2012) tested the ZTPI structure with the data from professional financial advisors, yet failed to support the fit of theoretical models suggested by prior research. According to the findings in this study, however, the original five-factor ZTPI seems to fit well to the business persons. Though researchers have often suggested significant differences between student samples and occupational samples, the present study refuted such an assumption and suggested the generalizability of this popular measure of temporal frame across cultural and situational differences.

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Chapter 26
Validation of the Spanish version of the Consideration of Future Consequences Scale

Alejandro Vásquez
Ana Martín
Alejandro Maiche
Center of Basic Research in Psychology, University of the Republic, Uruguay avasquez@psico.edu.uy

Abstract: We tested the validity of a Spanish version of Strathman et al.'s (1994) Consideration of Future Consequences Scale (CFC-S). A sample of 158 Uruguayan university students completed the CFC-S scale and the Big Five Personality Inventory. We performed exploratory factor analyses that showed that the scale resembles the bi-factorial structure found in some of the samples with the English version, with a Future and an Immediate sub-scale. Results showed that the CFC Scale has acceptable psychometric properties though refinements are needed: the item 5 presents some problems both in loadings and item-total correlations. Additionally, men scored higher than women on the CFC-I sub-scale and, conscientiousness is the most correlated personality trait with the scale.

Keywords: consideration of future consequences, scale adaptation, personality traits, subjective temporality.

Introduction

Time perspective refers to a psychological process, generally unconscious, which role is to organize the ongoing human experience in time and also the conflicts and needs that arise from the confrontation of interests between different partitions of time or temporal dilemmas. Within this process, a more specific concept can be identified, time orientation. It is a personality trait which can predict how people interpret events and make decisions. Consideration of Future Consequences (hereafter CFC) is a specific construct of time orientation. It is defined as the degree in which people "*consider the possible distance of the results of its current behaviors and the extent to which they are influenced by these potential outcomes*" (Strathman, Gleicher, Böninger, & Edwards, 1994). Recent research suggests that the scale is comprised of two factors, one referring to the weight put in the immediate consequences (CFC-I), and other relating to the more distant outcomes (CFC-F). Joireman, Balliet, Sprott, Spangenberg and Schultz (2008) 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.

Despite it has been extensively used for approximately 20 years and it was related to relevant behavioral constructs in the English speaking-countries, there is still little research about the cross-cultural validity of the instrument and the underlying factor structure. Thus, the aim of the present work was to evaluate the internal consistency, factor structure and convergent validity of the Spanish version of the Consideration of Future Consequences Scale.

METHOD

Participants

A sample of 158 first-year engineering and psychology students (82 males, *M* age = 20,0, *SD*= 4.7) were recruited at the University of the Republic (Uruguay).

Instruments

*Consideration of Future Consequences Scale.*The CFC scale has good psychometric properties in its English version (Strathman, Gleicher, Böninger, & Edwards, 1994) and its concurrent validity has been demonstrated consistently in four domains of behavior: (a) academic achievement, economic decision making and preventive health behaviors, (b) prosocial behavior (c) environmental behavior and (d) aggressive behavior (Joireman, Strathman & Balliet, 2006). This scale is composed of 12 items, which are evaluated using a 7-point Likert scale. In the CFC Scale higher numbers indicate a greater consideration of future consequences. Items 3, 4, 5, 9, 10, 11, 12 (CFC- Immediate sub-scale items) are reverse-scored for a general CFC score. Back-translation was used to adapt the English CFC scale to Spanish. In Table 1 we present some of the sample items of the CFC in Spanish.

Table 1 – *Sample Items of the CFC Scale – Spanish Version*

CFC-Immediate (Factor 1)	**CFC-Future (Factor 2)**
4. Mi comportamiento solamente está influenciado por los resultados inmediatos (por ej., en cuestión de días o semanas) de mis acciones. 11. Actúo solamente para satisfacer temas inmediatos, imaginando que me ocuparé de futuros problemas quepudieran surgir más adelante.	6. Estoy dispuesto a sacrificar mi felicidad o bienestar inmediato para lograr resultados a futuro. 7. Creo que es importante tomar seriamente las advertencias sobre resultados negativos, incluso si esos resultados no vana ocurrir en varios años.

Big Five Personality Inventory (BFI). The BFI is probably the most used instrument to assess personality traits. It classifies and describes personality using five dimensions: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience (Benet-Martinez & John, 1998). It also incorporates a scale to measure social desirability. The inventory is composed of a total of 44 items, evaluated using a 5-point Likert scale.

Sociodemographic Data Questionnaire. Age and Sex were also collected for further analyses.

Procedure

The administration of the two instruments was held in a single group session at the beginning of a regular lecture at the University. All subjects gave free and informed consent before completing the questionnaires.

Data analysis

Traditional psychometric analyses were performed to explore the psychometric properties of the scale. An exploratory factor analysis (EFA) with principal components was carried out. Correlation coefficients between the factors of the CFC and the dimensions of the BFI were calculated.

Results

The EFA identified two factors, which replicated the factor structure of the English version of the CFC scale proposed by Joireman *et al* (2008). The solution obtained explains 43.8% of the total variance. Factor 1, CFC-Immediate, relates to higher concerns about immediate consequences of behavior (eigenvalue = 3.5, explained variance = 29.5%) is composed by items 3, 4, 9, 10, 11 and 12. Factor 2, CFC-Future, related to higher concerns for the distant outcomes (eigenvalue = 1.7, Explained variance = 14.3%), being correlated to items 1, 2, 6, 7 and 8. Item 5 did not load to any of the factors in a satisfactory way. In Table 1 we present factor loadings superior to .30 (in italics the loadings of item 5).

Table 2 – *Factor loadings of the two factor solution of the CFC in Spanish*

Item	Factor 1	Factor 2
1	.33	.33
2		.53
6		.67
7		.76
8		.58
3	.70	.32
4	.78	
5	*-.12*	*-.19*
9	.58	
10	.68	
11	.85	
12	.67	

The internal consistency of both factors of the scale was acceptable: Cronbach's alpha = 0.74 for CFC-Immediate and α=0.60 for CFC-Future). The complete scale showed an internal consistency of α=0.72. Inter-item correlations were acceptable for a broad construct such as CFC (Clark & Watson, 1995). The mean inter-item correlation of the CFC-F was .21 and for the CFC-I was .28. In this case, we should note that Item 5,

correlated negatively or null (below .01) with all other CFC-I items. If that item is deleted the mean inter-item correlation rises to .43.

Concerning relationship of the CFC with personality variables, CFC-Immediate was negatively correlated to Agreeableness, Neuroticism, Openness and Conscientiousness. On the other side, CFC-Future was positively correlated to Openness (Table 3).

Table 3 – *Correlations of the CFC with Big Five Personality Factors*

	2	3	4	5	6	7	8
1. CFC- Total Score	.71**	-.86**	.14	.18*	.19*	.24**	.24**
2. CFC- Future		-.26**	.10	.05	.14	.21**	.11
3. CFC- Immediate			-.11	-.21**	-.16*	-.18*	-.26**
4. Extraversion				.18*	-.25**	.28**	.06
5. Agreeableness					-.26**	.10	.15
6. Neuroticism						-.10	-.10
7. Openness							.29**
8. Conscientiousness							-

* p< .05; ** p< 0.01

Finally, we explored possible sex differences in CFC. As expected, we found that males tend to weight more the immediate consequences of behavior than females (Table 4).

Table 4 – *Means and t values for sex comparisons*

Scale	*M* (Males)	*M* (Females)	*t* (*d.f.* 1, 156)	*p*
CFC-Immediate	3,4	3,0	2,33	.021
CFC Future	4,6	4,6	0,2	n.s.
CFC-Total	4,6	4,8	-1,56	n.s.

Discussion

The objective of this research is to validate the CFC Scale to the Spanish language and, more specifically, to the Uruguayan population. Data presented here shows that this objective could be reached.

Concerning the reliability, the Spanish adaptation of the CFC Scale showed acceptable internal consistency, good construct validity, and a two-factor structure, coincident with

the English two factor solution, with a CFC-F subscale and CFC-I subscale.As with the English version, the CFC is related to some personality traits, and presents sex-typed variances.

However, some limitations of our work should be mention. Further refinements should be done to improve psychometric properties of the scale. The item 5 shows very low loadings to any of the factors and reduces the internal consistency of the CFC-I subscale. Also, the internal consistency of the CFC Future 5-item scale, despite acceptable for research intentions, could be improved. In this regard, recently Joireman, Shaffer, Balliet, & Strathman (2012) proposed a 14-item CFC scale that improved considerably the internal reliability of the CFC Future sub-scale. Future work should be oriented to add the two new CFC-Future items and re-write the Item 5 that it is of difficult translation. Also, confirmatory factor analyses should be perform to clearly establish the underlying factor structure of the spanish version of the CFC.

In conclusion, it seems reasonable to use the CFC-Spanish for research on temporal orientation in Uruguayan population. However, future work is needed to guarantee high quality research on the CFC construct in Spanish speaking countries.

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Chapter 27

An exploratory approach to Time Perspective theory and research

Victor E. C. Ortuño
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal
victortuno@gmail.com

Catarina V. M. Gomes
Independent Practice, Porto, Portugal

Maria Paula Paixão
Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal

Isabel Nunes Janeiro
Faculty of Psychology, University of Lisbon, Portugal

Abstract: The Time Perspective theoretical model proposed by Zimbardo & Boyd (1999) has been very prolific in the quantity and quality of research produced in the last decade. However, taking into account the definition of time perspective of Kurt Lewin (1951), we believe that a negative future dimension is an important component of the individual's time perspective. The objective of this study is to verify a 7-dimension model of Time Perspective formed by the 5 original dimensions of the Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999), the Transcendental-Future from Transcendental-Future Time Perspective Scale – TFTPS (Boyd & Zimbardo, 1997) and the Negative Future Scale from Inventário de Perspectiva Temporal – IPT (Janeiro, 2012) in a sample of 563 Portuguese college students. Through Exploratory Factor Analysis we found evidence that supports this model. The majority of items load above .30 in their respective factors, the internal consistency of the 7 dimensions ranges from .722 to .865 and the total variance explained is 46.18%.

Keywords: time perspective, motivation, negative future, ZTPI, exploratory factor analysis.

Introduction

Regardless of the theoretical approach, time has been pointed to on numerous occasions as a relevant dimension for human behavioural analysis. With Philosophy, it is possible to consider time as a structural component of human thoughts and behaviours (Kant, 1781/1965).

With the work of Kurt Lewin (1951), we can understand that individuals create meanings about the present, but also about the past and future moments, and that these same meanings affect their thinking and behaviour. Therefore, how we evaluate our past and future also influences our hopes, desires, fears, and consequently our behaviour. Thus, Lewin

(1951) introduced the concept of Temporal Perspective as "the totality of the individual's views of his psychological future and psychological past existing at a given time" (pp. 75).

At present, one of the most widely used theoretical references for the research of time is the one proposed by Zimbardo and Boyd (1999). Continuing the thought of Lewin, these authors argue that Time Perspective is an unconscious process that assists individuals to encode, store and retrieve information related to personal and social objects that fill their life; this process makes it possible to bring order, meaning and coherence to these same objects through various time categories, which also allow a reinterpretation of all this information.

This model is originally composed of 5 temporal dimensions, Past Positive, Past Negative, Present Hedonist, Present Fatalist and Future. Boyd and Zimbardo (2008) introduced a further sixth temporal dimension: The Trancendental-Future Time Perspective, related with the cognitions about the future after the death of the physical body. Yet, it is important to consider that in Lewin's definition of Time Perspective, he considers the effect of fears and anxiety on human behaviour and cognition. Taking this into account, it was decided to add a seventh temporal dimension to the study. The Future Negative (or Anxious Future) relates to negative feelings and an external and instable control locus about the future.

The goal of this study is to test a model of Time Perspective, which includes these 7 temporal dimensions.

Method

Participants

Composed of 563 participants with ages between 17 and 54 years old (M = 20,15, S.D. = 4.24). 511 (91.7%) are female and 46 (8.3%) male. The participants are students from the Faculty of Psychology and Educational Sciences of the University of Coimbra. 496 (88.7%) attend the Integrated Master in Psychology, 13 (2.3%) the Master in Educational Sciences and 47 (8.4%) the Social Work Undergraduate Degree.

Instruments

All the data were collected using 4 instruments: a Socio-Demographic Questionnaire, the Portuguese Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999; Ortuño & Gamboa, 2009), the Portuguese Transcendental-Future Time Perspective Scale – TFTPS (Boyd & Zimbardo, 1997; Ortuño, Paixão & Janeiro, in press) and the Future Negative Subscale of the Inventário de Perspectiva Temporal – IPT (Janeiro, 2012).

Socio-Demographic Questionnaire: Drawn up by the authors in order to characterize the sample (age, sex, course, course year, etc.).

Zimbardo Time Perspective Inventory – ZTPI (Zimbardo & Boyd, 1999; Ortuño & Gamboa, 2009): this is composed by 56 items (5-point Likert scale) in its Portuguese version (Ortuño & Gamboa, 2009) which represents 5 temporal dimensions: 1) Past Positive, related to pleasant and warm attitudes towards the past (explained variance = 6.02%, α = .68, 9 items), 2) Past Negative, represents an aversive and distressful attitude towards the past (variance explained = 7.85%, α = .80, 10 items), 3) Present Hedonist, represents a tendency to seek immediate pleasure, through exciting and risky experiences

(explained variance = 8.37%, α = .79, 15 items), 4) Present Fatalist, shows a totally defeatist attitude towards life (explained variance = 6.42%, α = .66, 9 items) and 5) Future, indicates a strong tendency to create and pursue long term objectives (variance explained = 6.57%, α = .74, 13 items). These 5 temporal dimensions explain 35.25% of the total variance and a test/re-test validity values between .66 and .86.

Transcendental-Future Time Perspective Scale – TFTPS (Boyd & Zimbardo, 1997; Ortuño, Paixão & Janeiro, in press): this is a one-dimension scale, formed by 10 items (5-point Likert scale). Evaluates the individual's beliefs and attitudes about the future after the death of the physical body. The original TFTPS explains 10% of the total variance, with a internal consistency of .87 and a test/re-test stability of .86.

Inventário de Perspectiva Temporal – IPT (Janeiro, 2012): this is formed by 32 items (7-point Likert-type scale), grouped in 4 temporal dimensions: 1) Past Orientation, 2) Present Orientation, 3) Future Orientation and 4) Negative Future. In this study we used only 4 items related with the negative future dimension (variance explained = 8%, α = .70, 4 items) which is related to an unpredictable and threatening vision of events yet to come.

Procedures & Statistical Analyses

All the data were collected in classrooms. The responses were standardized and any values higher than 2.5 or lower than -2.5 were considered outliers. An Exploratory Factor Analysis – EFA was performed using the 56 ZTPI items, 9 items of TFTPS (Item Nº 5 was eliminated since it presents conceptual and statistical problems in this sample) and 4 items of the IPT (regarding the Future Negative sub-scale). The EFA extraction method was principal component analysis, with Varimax Rotation and fixed to 7 factors. The missing values were replaced with the mean item value.

All the collected data was introduced in the statistical program *Statistical Package for the Social Sciences – SPPS* 16.0 (Windows version).

Results

Exploratory Factor Analysis

The total variance explained by the seven factors was 46.18%. The KMO index for sample adequacy was .894 and the Bartlett's Test of Sphericity value was significant ($p <$ 001). 62 of the 69 items used in the EFA exhibit loadings higher than .30 in the correct factor. The first factor encountered was *Present Hedonist* with 9.18% of explained variance. The second factor was *Future* with 8.28%. The third was *Past Negative*, with 7.92%. The fourth *was Transcendental-Future*, with 7.18%. The fifth was *Past Positive*, with 4.93%. The sixth was *Future Negative*, with 4.41% and the seventh was *Present Fatalist*, with 4.30% of explained variance.

Internal Consistency

The results of Cronbach's alpha for the 7 factors ranged from .746 to .865 (see Table 1). None of the items' removal represents a substantial improvement of those values.

Table 1 – *Exploratory Factor Analysis of the 7 Dimensions Time Perspective Model (ZTPI, TFTPS & IPT)*

Dimensions (Cronbach's α)	Items	PH	F	PN	TF	PP	FN	PF	M	DP	α without item
Present Hedonist (PH) (α = .852)	31	**.668**							2.89	.94	.835
	42	**.635**							2.63	1.05	.845
	23	**.623**							2.99	.92	.841
	46	**.619**							3.38	.96	.838
	32	**.618**							3.57	.97	.836
	26	**.606**	.405						3.92	.93	.834
	48	**.560**	.336						3.68	.98	.839
	44	**.553**							3.19	1.04	.840
	8	**.533**							3.04	.97	.845
	19	**466.**							3.59	1.11	.847
	28	**459.**							3.0	1.04	.848
	12	**.438**	.319						3.61	1.06	.842
	17	**.436**					-.332		3.97	.85	.846
	1	.529	**.581**						4.1	1.16	.835
	55							-.318	4.23	.74	.864
Future (F) (α = .746)	10	.354	**.711**						3.83	.88	.715
	30		**.709**						3.73	.89	.709
	45		**.697**						3.38	.97	.711
	18		**.680**						3.94	1.02	.711
	40		**.677**						3.63	.88	.715
	13		**.648**						3.85	1.02	.713
	51		**.632**						3.39	.90	.719
	21		**.512**						3.95	.72	.729
	43		**.354**						3.05	1.26	.732
	9							-.259	4.04	1.11	.747
	24	-.553						-.402	3	1.01	.764
	56	-.359							3.29	.92	.764
	6						.303		2.41	1.25	.752
Past Negative (PN) (α = .843)	50			**.767**					2.46	1.06	.812
	16			**.739**					2.60	1.07	.814
	34			**.712**					2.41	1.10	.819
	27			**.657**					3.07	1.244	.826
	54			**.629**					2.72	1.11	.820
	22			**.583**		-.339			1.97	1.12	.835
	4			**.565**					3.47	.97	.834
	36			**.550**					2.71	1.09	.828
	33			**.366**				.303	2.72	.87	.838
	5						.289		2.78	.92	.852

Dimensions (Cronbach's α)	Items	PH	F	PN	TF	PP	FN	PF	M	DP	α without item
Transcendental-Future (TF) (α = .865)	3				**.809**				2.64	1.224	.838
	1		.307		**.739**				2.85	1.32	.840
	2				**.729**				2.58	1.26	.842
	4				**.694**				2.35	1.13	.851
	9				**.684**				2.32	1.12	.851
	10				**.682**				2.46	1.23	.854
	8				**.678**				2.41	1.16	.851
	6				**.671**				3.49	1.18	.843
	7	.393			**.442**				3.71	1.09	.858
Past Positive (PP) (α = .765)	15					**.611**			3.39	1.07	.726
	49					**.591**			3.75	.99	.748
	7					**.590**			3.07	.98	.728
	41					**.536**			3.97	.92	.761
	20	.305				**.477**			3.81	.94	.734
	29					**.455**			3.20	1.16	.754
	11	.362		-.376		**.406**			3.71	1.04	.738
	2	.355	.485			**.462**			3.82	.99	.724
	25			-.639		**.437**			4	.99	.769
Future Negative (FN) (α = .858)	27			.362			**.654**		2.06	1.46	.792
	09			.332			**.651**		2.01	1.4	.803
	16			.307			**.645**		2.50	1.6	.813
	05						**.631**		2.27	1.51	.866
Present Fatalist (PF) (α = .722)	39							**.645**	1.92	.935	.688
	14							**.583**	2.42	1.02	.692
	53							**.527**	2.14	.981	.694
	37	.355		.315				**.496**	3.03	1.06	.672
	38			.338				**.481**	2.15	.96	.683
	52							**.306**	2.23	1.01	.721
	35							**.302**	2.43	.90	.700
	3				.326			**.324**	2.56	.97	.711
	47					.324	.303		2.49	1.05	.713

Discussion

The results of this exploratory attempt to improve the study of Time Perspective were satisfactory. The proposed model was confirmed by a clear factor structure with high loadings and good internal consistency across the 7 temporal dimensions. The KMO index and Bartlett's Test results were also satisfactory. With these results we would like to show the possibility of developing the 5-dimension TP model even further. We believe that the Negative Future and Transcendental-Future Temporal Perspectives can bring an important

understanding of human behaviour. As Ortuño, Paixão & Janeiro (2011 – February) point out, Negative Future Time Perspective can significantly contribute to explaining Self-Esteem, for the two are negatively related. Regarding Transcendental-Future, in a cross-sectional study with a sample of college students, Ortuño, Paixão e Janeiro (2011a) noticed that the mean scores of the TFTP lowered as the students advanced in their academic courses. The same authors (2011b) also found significant differences between religious and non religious students, noticing that religious students show higher scores of TFTP. Thus, we recommend the addition of these two temporal dimensions for future researches on the subject of Time Perspective.

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Chapter 28

Different measures of future orientation may yield opposite predictions of environmental attitudes and behavior

Nurit Carmi
Environmental Sciences Department, Tel-Hai College, Israel
nuritcar@telhai.ac.il

Abstract: Future orientation (FO) expresses interpersonal differences affecting the creation of attitudes and behavior in many life areas. FO is a prerequisite of sustainability, which requires considering environmental consequences for future generations. This study compared between two primary measures of FO: Zimbardo's Future Time Perspective (F-ZTP) and Consideration of Future Consequences scale (CFC), in the environmental context. While higher values of CFC predicted significantly higher levels of environmental variables, higher values of F-ZTP did *not* predict higher levels, and in some cases even predicted significantly *lower* levels of environmental variables. These findings suggest that different constructs capture different dimensions of FO; while F-ZTP seems to capture personal-only aspects of FO, CFC relates to more general aspects of FO, including, but not only, personal realms. When temporal conflicts involve social conflicts, as in most environmental conflicts, an inconsistency between the predictabilities of the constructs may emerge, revealing a conflict between the "futures" people are orienting at.

Keywords: future orientation, zimbardo time-perspective, consideration of future consequences, environmental attitudes, environmental behavior.

Introduction

Future orientation (FO) is an inseparable component of the skills required by an individual or by society to protect nature, to recognize and take responsibility for the state of the environment for future generations and to be committed to a sustainable way of life. Considering its importance for environmental education and communication, great interest has been aroused in the study of FO in its environmental context (for a review, see Joireman, 2005). The two primary tools that have been used in contemporary research are: 1. Future Orientation construct included in Zimbardo›s Time Perspective Inventory (F-ZTPI) (Zimbardo & Boyd, 1999) and 2. The Consideration of Future Consequences (CFC) Scale (Strathman et al., 1994). The F-ZTPI assesses the tendency to plan for and achieve future goals, to be organized and efficient in the use of time in order to fulfill many tasks and reach high standards (For a broad international review of research on ZTPI, see Zimbardo & Boyd, 2008; or www.timeperspective.com). CFC assesses «the extent to which individuals consider the potential distant outcomes of their current behaviours and the extent to which they are influenced by these potential outcomes" (For a review, see Joireman, 2005). Most studies have used *either* CFC *or* F-ZTPI as a measure for FO. The

few that have used *both* constructs simultaneously concluded that both constructs share common characteristics, yet there are differences which should be considered (Adams and Nettle, 2009; Crocket, Weinman, Hankins, and Marteau, 2009). To date, no study has yet investigated FO simultaneously with CFC and F-ZTP *on the same issue in the environmental realm.* The present study aims at comparing the patterns with which the two instruments predict various environmental variables. Such a comparison is important for two reasons: The first reason relates to a general methodological aspect of measuring FO. In light of the inconsistency between the two FO measures, hinted by the abovementioned studies, the question is: What aspects of FO do they actually capture? Analysis of inconsistency between the two constructs, if revealed, may contribute to every study that uses either of these constructs as measures of FO, and may help to choose the appropriate construct. The second reason relates to the specific studied context: the environmental realm. If the development of FO is a key factor in promoting environmental attitudes and behavior, it is especially important to be well acquainted with the tool(s) for measuring FO.

Method

The study is based on an internet convenience sample (Qualtrics Research, Suite 2011) distributed by email and by Facebook (n=361; 69.5% females, mean age±SD 32.2±12.1 years). Each respondent completed CFC, F-ZTP and environmental questionnaires. Environmental attitudes, perceived severity of environmental problems, environmental efficacy, and willingness to sacrifice for the sake of the environment were assessed with a questionnaire already developed and validated by Peer, Goldman & Yavetz (2007), to be used on an Israeli student population. They made a distinction between environmental behaviors with personal benefit and behaviors that lack personal benefit (Goldman, Yavetz & Peer, 2006). We used two of their items to measure engagement in environmental behaviors that have **personal benefit** (**saving water and electricity**) (Cronbach's α=.57) and four items to assess behaviors **not involving personal benefit** (for example, picking up trash that others have thrown away when going out into nature or gathering newspapers and used papers and bringing them to bins for recycling (Cronbach's α=.66).

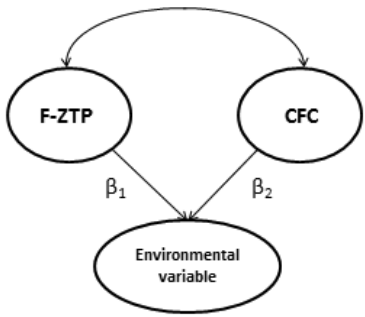

Figure 1. General SEM model of the effects of FO, measured by CFC vs. F-ZTP, on environmental variable (β_1 and β_2 are regression coefficients of F-ZTP and CFC, respectively.)

Statistical analyses

The regression coefficients of F-ZTPI and CFC on each of the environmental variables were calculated separately using a structural equation model (SEM) (Figure 1) in which each measure was treated as a latent variable, consisting of all of its original items as indicators.

Results

CFC was found to be positively correlated with F-ZTPI; r=.34 ($p < .001$). Table 1 presents the regression coefficients of F-ZTPI (β_1) and CFC (β_2) on each of the environmental variables. All models fitted the data reasonably well.

Table 1 – *Standardized regression coefficient of CFC and F-ZTPI on environmental variables (n=361)*

Environmental variables.	Measures of FO		Model fit statistics			
	F-ZTPI (β_1)	CFC (β_2)	χ^2/df	CFI	NFI	RMSEA
Attitudes	.02 ns	.25***	1.658	.911	.806	.043
Perceived severity	-.13*	.29***	1.717	.924	.838	.045
Efficacy	.01 ns	.30***	1.579	.922	.817	.040
WTS	-.18*	.39***	1.708	.904	.800	.044
Behavior (with personal benefit)	.16*	.15*	1.746	.913	.822	.046
Behavior (without benefit)	-.12 ns	.36***	1.694	.902	.795	.044

*p<.05, ** p<.01, *** p<.001

F-ZTPI scores significantly and *negatively* predicted perceived severity of environmental problems, WTS and, negatively yet not significantly, behavior without personal benefit. Higher F-ZTPI scores did *not* result in significantly higher scores in environmental attitudes and environmental efficacy. The only variable that showed significant higher levels with higher F-ZTP was behavior with personal benefit. On the contrary, CFC scores significantly and *positively* predicted **all** of the environmental variables. The highest positive effect was on WTS and on behaviors without personal benefits.

Discussion and conclusions

The present study suggests that "future orientation" is not a simple univalent entity, but may represent different and not necessarily coherent contents such as mental, planning and self-regulation skills as well as tendencies and motivations to consider future implications of present actions. It appears that those scoring high on F-ZTPI did not view the future

of the environment as a value which is worth a present sacrifice, or they did not view an environmental development as a scenario which is likely to affect their own personal future. F-ZTPI describes skills of time management, delay of gratification, and sticking to a time schedule. In certain contexts (personal-private), these skills may be critical for ensuring future developments which may benefit the individual but not necessarily the environment. In comparison, all CFC items deal with quantifying the relative weight granted by the individual in the present to future implications *in general*, and are not phrased specifically to the future of the individual him/herself. These findings raise the question of which "future" is measured by the two constructs. In this study, the only variable predicted by the two constructs in a similar pattern was the behavior *with personal benefit*. Perhaps only when FO is measured in *private* contexts is there greater consistency in the predictive patterns of the two constructs. Behaviors without personal benefit are better predicted by CFC, indicating that CFC reflects long-term considerations which refer to the future in general, not only the future of the individual him/herself. Zimbardo & Boyd (1999, p.1281), describe the "prototype" of the future oriented individuals (according to F-ZTP) as *…"highly organized, ambitious goal seekers who felt pressed for time but were willing to sacrifice present enjoyment to achieve their career objectives".* They are characterized as self-centered and reward-dependent, who waste no time on hanging out with friends or even making them in the first place. These qualities do not necessarily contribute to the development of concern and pro-environmental behavior, and perhaps the opposite may be true. Perhaps the ambitions and the self-centeredness characterizing those who scored high on ZTPI, combined with the ability to sacrifice comfort for (private) future interests, are intended primarily to benefit their own private future. The social deficit which they are willing to pay should actually hint at lower social concern. This reinforces previous findings that ZTPI successfully predicted attitudes and behaviors directed to future results in the personal realm (studies, health) but not in the environmental area, which is not solely personal (Carmi, 2012). To sum up, the inconsistency between the predictabilities of the two constructs seems to be context-dependent, and may reveal and expose conflicting interests between the "futures" people are orienting to. The correlation found between the two constructs (r=0.34) has been documented previously in the range of 0.3-0.5. This means that even though the two constructs provide 10% of the shared variance, it is quite possible that the remaining 90% of variance, stemming from other sources representing other dimensions, will refer to other qualities in a different and even opposite way. Finally, this research has demonstrated that FO is a significant predictor of attitudes and behavior in temporal conflict situations. The studied instruments may offer equivalent predictions in areas in which personal and non-personal futures are not at odds. But when temporal conflicts involve social conflicts, as in the environmental context, the two measures of FO may have different and even opposing effects on attitudes and behaviors. Further research, *using both instruments* along with various psychological variables and in additional contexts, is warranted to understand the differences and to better adapt the instrument to the studied realm.

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Chapter 29

Identification of the Multidimensional Model of Subjective Time Experience

Karel Flaska
Panajotis Cakirpaloglu
Department of Psychology, Philosophical Faculty of Palacky University, Czech Republic

Abstract: A comprehensive metaanalysis of empirical studies on the phenomenon of subjective time-distortion has provided strong evidence that a close relationship between subjective time-distortion occurrence and subjective significance (or emotional judgment) of stimulus exists. The authors suggest an original model of subjective time passage experience consisting of two bipolar dimensions – emotional judgment and perceived speed of time passage. Experimental and statistical verification of this model is the main objective of this study. Participants were 30 undergraduate students (15 males and 15 females) ranging in age from 20 to 26 years. Sophisticated experimental design based on the presentation of music samples with a specific emotion potential was developed. Actual emotional experience triggered by the music samples will be registered via semantic differential technique, together with retrospective time duration and time passage judgment. Eysenck Personality Questionnaire was also administrated. Data will be processed by variety of inductive statistics methods. The identified multidimensional model may significantly enrich many areas of psychological theory and practice. Above all, it is expected to provide valuable data for the development of a new psychodiagnostic method for affective disorders assessment.

Keywords: time, perception, emotionality, multidimensional model.

Introduction

Paradigms in time experience research

There are two most influential paradigms in time experience research, which need to be distinguished – the *prospective* and the *retrospective paradigm* (Block & Zakay, 2010). While in prospective paradigm, the subjects are told in advance that they are expected to make time judgment, in the retrospective paradigm, the subjects are not aware of this fact (Block, 1990). There is a consensus among contemporary time researchers that they are saturated by different psychological mechanisms and that, for any proper progress in the field of time experience research, these two should not be confused (Wearden, 2005).

Two basic types of subjective time experience

Subjective time experience is accessible to experimental measurement in two basic modalities – *time duration* and *time passage judgment*. While time duration judgment can

be defined as the subjective evaluation of duration length, time passage judgment can be defined as the perceived speed of time passage (Block, 1990; Wearden, 2005; Sucala et al. 2010; Sucala 2011).

According to some authors, these modalities are considered to be unrelated and supported by different cognitive mechanisms (Wearden, 2005). Luthman, Bliesener & Staude-Müller (2009, p. 2) go yet further with their interpretations and in the introduction to their study, among other, claim that: *"In verbal estimation task, a decreased subjective time flow will result in an underestimation of the standard time."* In our opinion, it's too early to make premature interpretations of the relationship between the two types of subjective time experience for the lack of consistent empirical evidence. We appeal all researchers in the field of time experience to be more orderly and to avoid such "translations" between these two types of time experience until empirical evidence based "code" or "pattern" for such translation will be obtained.

As far as we know, the first two studies investigating the relationship of the two types of time experience under the same methodological conditions were conducted by Sucala et al. (2010) and Sucala, Scheckner and David (2010/2011). In the first study within retrospective paradigm, Sucala et al. (2010) reported no significant correlation between time duration and time passage judgments. On the other hand, within the prospective paradigm, Sucala et al. (2010/2011), found a significant correlation between time duration and time passage judgment indicating that a longer interval estimate is associated with a slower perceived speed of time passage.

Emotionality and time experience

Several studies on the effect of emotionality on prospective time duration judgment in general population has shown that people tend to overestimate emotionally loaded stimuli relative to neutral stimuli, and that stimuli with negative affective valence seem to last longer than positive or neutral stimuli (Droit-Volet, Brunot, & Niedenthal, 2004; Noulhaine, Mella, Samson, Ragot, & Pouthas, 2007).

Enjoyment and boredom

Up to date research on the effect of hedonic value of an activity on subjective time experience seems to provide empirical support for naive theories about time perception as: time flies when you have fun and drags when you are bored. Within retrospective paradigm, Sucala et al. (2010) investigated the relationship among time perception expectancies, the perception of time progression and perceived hedonic value of a task in virtual reality environment. They found significant difference in time passage judgments between "enjoyment expectancies" and "boredom expectancies" conditions, which implies that when people expect to have enjoyable experience, they perceive time as passing more quickly relative to boredom expectancy. However, results didn't show any significant effect of hedonic expectancies on time duration judgment.

Arousal

Angrilli, Cherubini, Pavese, and Manfredini (1997) reported on differential effect of stimulus arousal level. While for low-arousal stimuli the duration of negative stimuli was

judged to be shorter relative to positive stimuli, for high-arousal stimuli condition, the duration of negative stimuli was judged to be longer relative to positive stimuli.

Fear, anger and anxiety

Langer, Wapner and Werner (1961) found shorter time duration judgments for subjects experiencing fear or danger relative to subjects in a neutral condition. On the other hand, Watts and Sharrock (1984) reported that spider-phobic subjects gave longer duration judgment of a short interval spent observing a spider relative to non-phobic subjects. Rinot and Zakay (2000) reported overestimation of the duration of aversive tones relative to neutral tones. Using the method of reproduction, Haim et al. (2010) reported longer duration judgments in anxious relative to non-anxious individuals when exposed to 2-second presentations of threat stimuli, but when exposed to neutral (calm) stimuli, no differences were found.

Gil and Droit-Volet (2011) found a relative overestimation of time for angry faces compared to the neutral faces in the temporal bisection, verbal estimation and production tasks, but not in the temporal generalization and reproduction tasks.

It's difficult to compare the findings because time distortions vary as a function of the presented emotional stimuli, with each stimulus having specific characteristics with regard to adaptation and timing (Gil & Droit-Volet, 2011).

Eysenck's basic dimensions of personality and time experience

Existing studies (e.g. Eysenck, 1959; Claridge, 1960; Kirkcaldy, 1984; Rammsayer, 1997; or Rammsayer, 2002) on the relationship between Eysenck's basic dimensions of personality and time experience are quite rare and provide highly inconsistent results. All of the studies used only the time duration judgment as the measured variable. So far to our knowledge, there is no study on the relationship between Eysenck's dimensions of personality and perceived speed of time passage (time passage judgment).

Extraversion and time estimation

Using method of reproduction, Eysenck (1959) reported significant overestimation of 5- and 10-sec intervals in extraverted neurotics relative to introverted neurotics. Claridge (1960) reported highly significant correlations (ranging from r = -0,51 to r = -0,66) between extraversion and time errors, which indicates the same tendency to overreproduce time in extraverts relatively to introverts. Similarly, Lynn (1961) also found larger negative time error (overproduction, or overestimation) in extraverts relative to introverts. However, this effect was found only in the last *three* of 10 trials. Zakay, Lomranz and Kaziniz (1984) also found that extraverts overestimated the *duration* of simple figures relative to introverts, but there was no difference between the groups, when complex stimuli were used. On the other hand, some studies indicate the tendency to underestimate time duration in extraverts relative to introverts. Finally, there are also studies where no significant relationship between extraversion and time estimation was found (Bachorowski & Newman, 1985; Du Preez, 1964; Gray, Gray, & Loehlin, 1975; Kirkcaldy, 1984; Orme, 1962; Rammsayer, 1997; Rammsayer, 2002, Reed & Kenna, 1964).

Neuroticism (emotional lability) and time estimation

Similar inconsistency in results can be found in studies on the relationship between neuroticism and time duration judgment. While Davidson and House (1982) found tendency to overestimate time duration in low neuroticism subjects relative to high neuroticism subjects, Kirkcaldy (1984) found a consistent, but not significant, negative correlation between neuroticism and time duration judgments. Results of remaining studies suggest that neuroticism and time duration judgment are unrelated (Du Preez, 1967; Rammsayer, 1997; Rammsayer 2002).

Psychoticism and time estimation

Studies on the effect of psychoticism on time duration judgment are extremely rare. Thanks to different methodology applied, neither their results can be compared. Using the method of production, Kirkcaldy (1984) found significant negative correlation between psychoticism and time duration estimation of 60-sec time interval in females. Using the method of reproduction, Rammsayer (1997) reported significant positive correlation between psychoticism and time duration judgment of 5- to 45-sec auditory intervals in males, which implies that males with higher psychoticism are more accurate and less vulnerable to overestimation than lower psychoticism males, since both groups overestimated. Finally, in his later work applying the method of comparison, Rammsayer (2002) revealed much better performance (greater accuracy/lower overestimation) on time duration judgments in the range of seconds in high psychoticism than in low psychoticism male subjects. In the range of milliseconds, no significant relationship between any of Eysenck's basic dimensions of personality was found in his male subjects.

Review of present research project

Relativistic approach to subjective time experience

Flaska (2011) introduced an original relativistic approach to the phenomenon of psychological time distortion inspired by Einstein's theory of relativity, which could provide a unifying framework to all the contradictory and incomparable results of subjective time experience research. He noticed that, despite all the inconsistencies in empirical results, one common denominator in the background of the phenomena of subjective time distortion can always be found – emotionality, or more generally subjective meaning. This finding can be formed into a general thesis: *"Always there, where relative change in subjective meaning (emotionality) occurs, subjective time distortion (relative change in subjective time duration, or speed judgment) occurs as well."* However, this thesis among others implies that a model of distorted semantic space-time continuum, where each subjective event would have its specific semantic position and specific "local" subjective time (passage or duration), could be developed. This is also the first objective of this study, which can be transformed into two separate following hypotheses:

Hypothesis 1: "A subjective time experience (time duration or time speed judgment) during a specific event and a specific position of this event in subjective semantic space are mutually dependent variables."

Hypothesis 2: "A psychological relativistic model of semantic space-time continuum can be developed."

Data for such semantic space-time continuum model could be easily obtained factorising data gained via semantic differential technique (e.g. in Osgood et al., 1957) and procedures commonly used to measure subjective time experience (e.g. in Gil & Droit-Volet, 2011). As the two basic types of subjective time experience can be simultaneously measured only via retrospective verbal estimation task, the framework of retrospective paradigm and verbal estimation task procedure were employed in our present study.

The choice of retrospective framework and simultaneous exploration of the two basic types of time experience under the same methodological conditions constitutes also the necessity to verify findings of Sucala et al. (2010), who reported statistical unrelatedness of the two types. Therefore, in correspondence with their findings, another hypothesis needs to be formulated:

Hypothesis 3: "Within the retrospective paradigm, time speed and time duration judgments are unrelated, and supported by different psychological mechanisms."

Two-dimensional model of subjective time passage experience

When we formulated the general thesis on the relationship between emotionality (subjective meaning) and time-distortion, we left out the directionality of the relationship (overestimation/underestimation or higher/lower speed of time passage), although existing studies seem to indicate such directionality – that the subjective time duration lengthens and subjective time passage slows down when relatively unpleasant (fearful, stressful, boring etc.) stimulus is presented. These results can definitely be taken as valid, but only for limited amount of types of subjective time passage experience. From this point on, we are going to narrow our considerations only to time passage type of time experience, to avoid translations of results between the two basic types (time duration and time passage experience).

To our knowledge, there's for example no study reporting on accelerated speed of subjective time passage in an unpleasant emotional state, which is maybe the most typical and equally the most problematic quality of time experience of modern western culture man. Contradictory, research reports on the decelerated speed of subjective time passage in a pleasant emotional state and supporting mechanisms as well are of the same or even higher importance, particularly for psychotherapy purposes. Therefore, we would like to propose a new descriptive model of subjective time passage experience that is able to cover all the four basic types of subjective time passage experience (see Figure 1a). The model consists of two basic dimensions – quantitative (the measure of subjective time passage acceleration or deceleration) and qualitative (the rudimentary system of emotional judgment – the aversion-appetence system). Since, the general emotional judgment dimension is expected to fragment into several subdimensions with specific relationship to the quantitative dimension of time passage experience, where some dimensions of this evaluative system are responsible for acceleration of subjective time passage, and others are responsible for deceleration of subjective time passage. Identification and differentiation of these subdimensions could become the main direction of future research in the field of subjective time passage experience. This also results in our fourth hypothesis:

Hypothesis 4: There are subdimensions of emotional judgment, where aversive judgment accelerates the subjective time passage.

Figure 1a and 1b shows the similarity of the suggested two-dimensional model of subjective time experience with the Eysenck's two-dimensional model of temperament (e.g. in Eysenck & Eysenck, 1975). In our opinion, the similarity is not accidental, but rather necessary, and results from the nature of temperament concept, which can be defined as a relatively stable (biological) disposition to specific contents and dynamics of emotional reactions. Proceeding from the assumption that every dynamics presupposes a change, and that every change presupposes time, then every theory of subjective time experience must also contribute to the theory of temperament. These speculations logically imply our last two experimental hypotheses:

Hypothesis 5: The neuroticism (emotional lability) dimension significantly correlates with the qualitative (emotional judgment) dimension.

Hypothesis 6: The extraversion dimension significantly correlates with the quantitative (time speed passage) dimension.

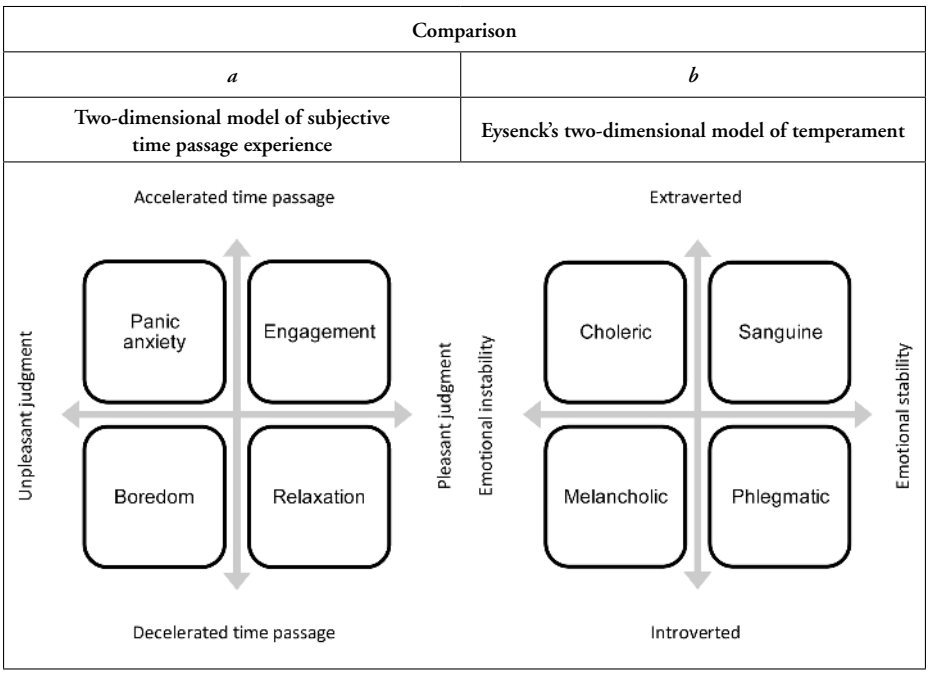

Figure 1. Comparison between the proposed two-dimensional model of subjective time passage experience and Eysenck two-dimensional model of temperament.

Sample & Method

Participants

Participants were 30 undergraduate students (15 males and 15 females) ranging in age from 20 to 26 years (mean age = 21.9 years, SD = 1.32). Each participant was rewarded

with 200 CZK, as compensation for the time spent in the experiment. Informed consent was obtained before the experiment started.

Stimuli and apparatus

The battery of experimental stimuli consisted of 29 complex instrumental music samples and 1 simple tone (f = 528Hz). All the 30 samples were presented in the same order and with the same standard duration of 60 seconds. The auditory stimuli were presented through Bose SoundLink Black multi-room sound system wirelessly connected with PC. Successive presentation of music samples was controlled through music player Winamp (version 5.572).

The complex instrumental music samples were grouped into 5 categories with working title: (1) *Sanguine (5 samples)*, (2) *Melancholic (5 samples)*, (3) *Choleric (5 samples)*, (4) *Phlegmatic (5 samples)*, and (5) *Horror (4 samples)*. These five groups were constituted with the requirement that the sample within the groups 1-4 triggered specific emotional states corresponding with the characteristics of four Galen temperament types, described for example in Eysenck and Eysenck (1975), and that the samples in the Horror group (5) triggered feelings of fear, tension, or anxiety. Placing a sample into one of the categories was conditioned by inter-subjective agreement of 2 independent collectors.

Procedure

Administration of the experiment was strictly individual to secure anonymity of the participants, and safe and confidential environment. Participants were told that the objective of the experiment is to explore relationship between music perception and personality characteristics. They were not told in advance that they are expected to make time judgments. There were also no clocks in the experimental room. If needed, participants were also asked to turn off their mobile phones and take off their wrist-watch.

After subscribing the informed consent, participants filled in the short version (48 items) of Czech adaptation of Eysenck Personality Questionnaire-Revised (EPQ-R; Eysenck & Eysenck, 1975), containing four scales: *Extraversion* (12 items), *Neuroticism* (12 items), *Psychoticism* (12 items) and *Lie/Social Desirability* (12 items).

Following experimental session began with this instruction: *"There are 30 sheets laid printed page down, one for each music sample, on the corner of the table. Your only task is to seat yourself comfortably, listen to the music samples and let them impress on you. Only after each music sample ends, you are supposed to take the sheet, fill it in and give it back to me. Now, I show you how to fill the sheet..."* Then, the participants were instructed how to register and differentiate their impression via semantic differential technique applied. Individual adaptation of volume was made on a non-experimental sample, before the first experimental sample was presented. The experimental music samples were presented in the constant successive order corresponding with the above mentioned numbers of groups. Simple tone (528 Hz) was interposed as the 15th, between the foregoing "Phlegmatic" (No. 14) and the following "Horror" (No. 16) sample.

Measures

Dependent subjective time variables registered in this study were retrospective *time duration* (measured in seconds) and retrospective *time speed* (measured on a 7-point Likert-type scale) *judgments*. Dependent emotional judgment variables were measured via 25 7-point Likert-type scales of semantic differential technique.

Results

To test the first two hypotheses, exploratory factor analysis was computed both for semantic differential scales and for stimuli music samples. Table 1 shows the results of exploratory factor analysis computed for the 25 scales of semantic differential. There were 4 main factors identified – *Evaluation, Stress, Activity and Predictability*. To maximize the reliability of the 4 obtained factors, Cronbach alpha values for each set of the most loaded factor scales was also computed. This process resulted in selection of 15 scales for further statistical analysis (see Table 2).

Relative average positions of the 30 music samples in the semantic space (Figure 1) together with variations of mean time speed judgment (Table 3) indicate that these could be mutually dependent variables, as our first hypothesis suggest, and that the data from Figure 1 and Table 3 together represent a real relativistic model of semantic space-time continuum. For statistical verification of this semantic time-space relationship, basic linear regression was computed. The results show that time speed judgment significantly correlates with all the four factors of semantic differential, as can be seen in Table 4, indicating that positive evaluation, low level of stress, high level of perceived activity and low level of predictability result in accelerated speed of time passage, while the opposite levels result in decelerated speed of time passage. There was also found significant, but much lower, correlation between time duration judgment and two of the four factors of semantic differential, indicating that positive evaluation and low level of perceived activity decrease the time duration estimation.

Pearson correlation coefficient between time duration and time speed judgment variables was not significant ($r_{xy} = 0.03$; $p > 0.05$), indicating that the two types of time experience are unrelated within the retrospective paradigm.

Concerning the effect of Eysenck basic personality dimensions on time experience (see Table 5), results of correlation analysis showed that time duration judgment significantly correlated with extraversion and psychoticism, indicating that high level of extraversion is associated with greater tendency for relative underestimation (shorter time duration judgment), while high level of psychoticism is associated with greater tendency for relative overestimation (longer duration judgment) and also with greater accuracy (because the research group as a whole tended to pervasive underestimation). Contradictory, no significant correlation between any of Eysenck personality dimensions and time speed judgment was found.

Finally, we did not find any significant correlation among any of Eysenck personality dimensions and factors of semantic differential (emotional judgment), except the highly significant correlation between extraversion and evaluative factor, indicating that high level of extraversion is associated with more positive evaluation of the presented stimuli.

Table 1 – *Varimax row rotated PCA (principal component analysis) factor loadings for 30 undergraduate students on 30 stimuli samples*

Scale	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
	Evaluation	*Stress*	*Activity*	*Predictability*
pleasant-unpleasant	.59	.62	.18	.05
happy-sad	-.03	.38	.78	.13
exciting-calming	-.01	-.55	.61	-.01
restful-challenging	.08	.77	.01	.16
intelligible-unintelligible	.47	.51	.13	.32
ugly-beautiful	-.79	-.44	-.02	.00
valuable-worthless	.87	.12	-.04	-.03
interesting-boring	.81	.07	.18	-.21
slow-fast	.03	.12	-.86	.02
meaningful-meaningless	.79	.28	-.04	.01
active-passive	.29	-.09	.78	-.01
tense-relaxed	-.12	-.87	-.08	-.09
safe-dangerous	.22	.86	.04	.13
stable-unstable	.22	.59	-.10	.43
inert-lively	-.29	-.22	-.77	.20
satisfied-unsatisfied	.20	.79	.26	.18
predictable-unpredictable	-.06	.39	.02	.79
closed-open	-.13	-.39	-.51	.25
violent-peaceful	-.14	-.85	.13	-.09
successful-unsuccessful	.69	.31	.29	.15
significant-insignificant	.86	-.01	.05	.04
strong-weak	.70	-.30	.13	-.05
known-unknown	.56	-.06	.18	.45
variable-invariable	.21	-.30	.32	-.64
like-dislike	.81	.34	.16	-.04
Percent of Total Variance	*25*	*24*	*15*	*7*

Table 2 – *Review of the 15 most factor loaded scales together with Cronbach alpha v alues for each factor group of scales*

Factor	Evaluation	Stress	Activity	Predictability
	ugly-beautiful	tense-relaxed	happy-sad	predictable-unpredictable
	valuable-worthless	safe-dangerous	slow-fast	variable-invariable
	interesting-boring	satisfied-unsatisfied	active-passive	
	meaningful-meaningless	violent-peaceful	inert-lively	
	significant-insignificant			
Cronbach alpha	*0.91*	*0.92*	*0.85*	*0.72*

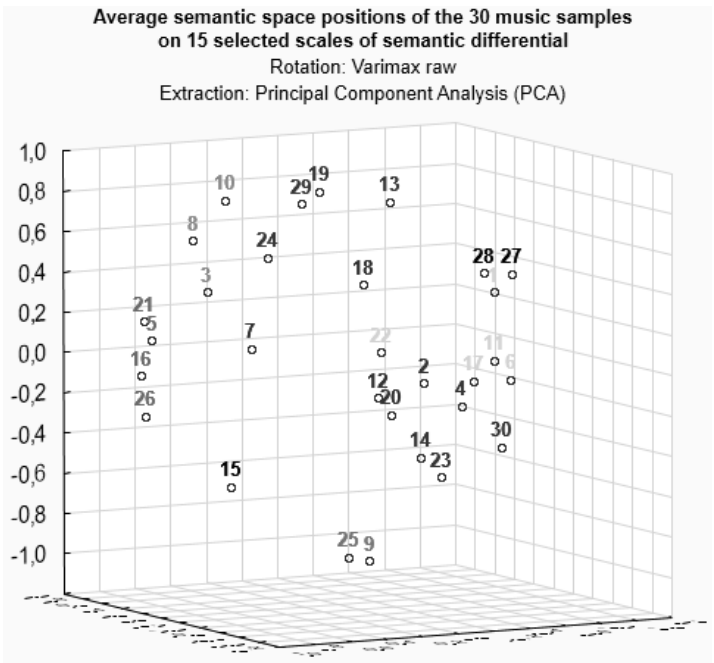

Figure 1. Average 3D semantic space positions of the 30 music samples on the 15 most factor loaded scales of semantic differential.

Table 3 – *Review of factor groups for the original set of 30 stimuli samples counted from positions on the 15 most factor loaded scales of semantic differential, together with mean time speed judgment (Mean TSJ) value of each sample on a 7-point Likert type scale ranging from 1 (extremely fast) to 7 (extremely slow)*

Group	**Sanguine 1**			**Phlegmatic 1**			**Choleric 1**		
	No.	Work title	Mean TSJ	No.	Work title	Mean TSJ	No.	Work title	Mean TSJ
	1	*Sanguine*	2.9	2	*Melancholic*	4.1	3	*Choleric*	3.5
	6	*Sanguine*	3.6	4	*Phlegmatic*	4.8	8	*Choleric*	4.2
	11	*Sanguine*	3.0	14	*Phlegmatic*	4.2	10	*Horror*	3.9
	17	*Sanguine*	3.1	23	*Melancholic*	4.2			
	22	*Sanguine*	3.3	30	*Phlegmatic*	4.0			
Group	**Sanguine 2**			**Phlegmatic 2**			**Choleric 2**		
	No.	Work title	Mean TSJ	No.	Work title	Mean TSJ	No.	Work title	Mean TSJ
	27	*Sanguine*	3.2	9	*Phlegmatic*	5.2	13	*Choleric*	2.9
	28	*Melancholic*	3.1	25	*Phlegmatic*	4.6	19	*Choleric*	3.6
							24	*Choleric*	3.6
							29	*Choleric*	3.8
Group	**Melancholic**			**Horror**			**Simple Tone (528 Hz)**		
	No.	Work Title	Mean TSJ	No.	Work title	Mean TSJ	No.	Work title	Mean TSJ
	7	*Melancholic*	4.6	5	*Horror*	4.8	15	*Tone (528 Hz)*	5.6
	12	*Melancholic*	3.9	16	*Horror*	4.5			
	18	*Melancholic*	4.0	21	*Horror*	4.2			
	20	*Phlegmatic*	4.0	26	*Horror*	4.8			

Table 4 – *Pearson correlation coefficients between the time duration and time speed judgment variables and weighted scores on the 4 factors of semantic differential (* p < 0.05; ** p < 0.01; *** p < 0.001)*

	FACTOR 1 *(Evaluation)*	FACTOR 2 *(Stress)*	FACTOR 3 *(Activity)*	FACTOR 4 *(Predictability)*
Time Duration Judgment	-.06*	.02	.12**	.01
Time Speed Judgment	.36***	-.17***	.46***	-.10**

Table 5 – Pearson c*orrelation coefficients between the scores on Eysenck personality dimensions and time duration and time passage judgments, and the weighted scores on the 4 factors of emotional judgment (*** p < 0.001)*

	Time Duration Judgment	Time Speed Judgment	FACTOR 1 *(Evaluation)*	FACTOR 2 *(Stress)*	FACTOR 3 *(Activity)*	FACTOR 4 *(Predictability)*
Extraversion	-.45***	-.05	.14***	-.02	-.03	-.01
Neuroticism	.02	-.02	.03	-.00	.03	.01
Psychoticism	.21***	.00	.03	.04	-.01	-.02

Discussion

The results of our study seems to provide strong evidence (supporting our first two hypotheses) that, within the retrospective paradigm, time passage experience and emotional judgment (or subjective meaning) are mutually dependent variables, which both together constitute semantic space-time continuum, where perceived speed of time passage can be (at least partially) predicted from a relative position of an event in a semantic space, and vice versa. The factor analysis of the raw semantic differential data revealed that the general emotional judgment factor falls into 4 main factors (Evaluation, Stress, Activity and Predictability). All of them highly significantly correlated with time speed judgment. While negative evaluation, higher level of stress, lower activity and higher predictability are associated with decelerated speed of subjective time passage, positive evaluation, lower level of stress, higher activity and low predictability are associated with accelerated speed of subjective time passage. Two out of the four identified factors of emotional judgment (Evaluation and Activity) significantly correlated also with time duration judgment, but these correlations were much lower than in the case of time speed judgment. However, it seems that similar semantic space-time model (as introduced for the experience of time passage) could be developed also for the emotional judgment and time duration experience, but with different relationships between these two variables, which opens the discussion on the (un)relatedness of the two types of time experience investigated in this study.

The strongest evidence supporting the first part of hypothesis 3 that the two types of time experience are unrelated within the retrospective paradigm provided correlation analysis, which revealed no significant relationship between these two variables. This result can be taken as verification of the findings of Sucala et al. (2010), who also reported unrelatedness of the two types of time experience.

Correlations between the two types of time experience and factors of emotional judgment and Eysenck basic personality dimensions support also the second part of the hypothesis 3 that the two types of time experience are associated with different psychological mechanisms. While the time duration judgment seems to be more associated with personality differences (extraversion and psychoticism), time speed judgment seems to be unaffected by basic personality dimensions and much more correlated with perceived stimulus characteristic, respectively with high-level cognitive processes of emotional judgment or meaning attribution processes. In other words, these findings raise the question of personality versus situation influences on the subjective time experience.

Moreover, the results of our study seem to question the emotional "neutrality" of stimuli commonly used in time research (e.g. Droit-Volet, Brunot, & Niedenthal, 2004; Noulhaine, Mella, Samson, Ragot, & Pouthas, 2007). Even the simple tone (sample No. 15), which could be taken as a "neutral" stimulus, evoked specific (extremely aversive) emotional judgment, which in turn resulted in extremely decelerated perceived speed of subjective time passage. For future research, these findings imply the necessity of consideration and evaluation of emotional characteristics of an employed stimulus.

Concerning the verification of the suggested model of subjective time passage experience, our study failed to find a dimension (or a scale) of emotional judgment, where explicitly negative emotional judgment would be associated with accelerated speed of subjective time passage. These facts call our suggested basic two-dimensional model of into question. Certain, but highly questionable, support for our fourth hypothesis represents the negative correlation between time speed judgment and predictability factor, indicating that unpredictable stimuli accelerate the perceived speed of time passage. The most questionable point is the aversive value of unpredictability. On the other hand, qualitatively considered, we succeeded in finding pleasant stimuli decelerating the perceived speed of time passage (samples No. 9 and 25). But it's necessary to mention that these two music samples were both perceived as sad. However, as was already mentioned, the values of time speed judgments are highly affected by the situational variables, namely by the characteristics of the stimulus presented, and thus by the experimental stimuli selection.

As the external validity of the basic four qualitative types of subjective time passage experience is undisputable, usage of more suitable methodological approach has to be considered. The main question is, whether listening of aversive music samples can put participants into aversive state with accelerated subjective time passage, or not. If yes, then different music samples have to be chosen. If the answer is not, then another methodological approach has to be chosen. Maybe an extreme (absurd) example of an aversive situation with undoubtedly accelerated time passage could provide the differential criterion. Let's imagine for example a hypothetical situation of a man, who has to deactivate a time bomb, having no idea how to do it, who cannot escape from the situation and who experiences it as a real situation (not fiction). Such description provides useful clues for construction of a suitable experimental situation with the same or at least similar characteristics (e.g. time limitation, high self-relevance, high task difficulty, exaggerating the repertoire of the subject's competences, and so on). This represents one of the possible ways of future research verifying the suggested two dimensional model of subjective time passage experience, containing the two exploratory neglected qualitative types of subjective time speed passage – time passage acceleration in unpleasant emotional states and time passage deceleration in pleasant emotional states.

Finally, similarity of the suggested two-dimensional model of subjective time passage experience with Eysenck two-dimensional model of temperament seems to be rather accidental. Significant correlation was neither found between neuroticism and any of the four identified factors of emotional judgment, nor between extraversion and time passage judgment.

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Chapter 30

Time in robot cognition: An emerging research branch

Michail Maniadakis
Panos Trahanias
Institute of Computer Science, Foundation for Research and Technology Hellas, Greece
mmaniada@ics.forth.gr
trahania@ics.forth.gr

Abstract: The long-term goal of robotic research is the implementation of intelligent and social artificial agents capable of interacting in human terms. Besides the significant progress in the field during the last decades, even state of the art robots exhibit poor social competencies when compared to humans or animals. An important reason for that is the lacking ability of robots to experience the flow of time, which in turn prevents artificial agents from sufficiently considering time in their perceptual, behavioral, cognitive, emotional and communicative processes. Given that time is an important dimension of human-human daily interactions, any machine that aims to be seamlessly integrated into human environments is expected to have mature time processing abilities. Based on the above, we put forward temporal cognition as a vital capacity of intelligent and social artifacts. In the present paper we will provide examples of the current robots' time processing insufficiency, we will discuss possible approaches for implementing artificial temporal cognition taking inspiration from the human time processing skills, and we will point out the significant impact that this new research branch is expected to have in the future of robotic research.

Keywords: artificial sense of time, bio-inspired robotics, temporal cognition.

Introduction

The ability to experience and process time is directly involved in most of the daily human activities. Consider for example how we are able to direct attention on a specific past period, how we weight alternative choices to minimize future risk with our decisions, how we select the objects that we put in our luggage before a trip, or how we coordinate our free time with the activities of friends. All these daily actions depend on our time processing capacity and the ability to mentally move back and forth in time. That is, intelligent human behaviors are not reactive but encompasses a lot of information regarding our previous experiences and future prospects.

However, current research in robot perception and action has mainly concentrated on the spatial properties of the environment, largely disregarding the temporal information that accompanies real world phenomena (Maniadakis et al., 2009; Maniadakis & Trahanias, 2011). Such a cognitive approach isolates artificial agents from the past and the future of the world, resulting in systems that are "stuck in time" (borrowed from Roberts, 2002), a characterization that is often attributed to animals or autistic children. In other words, for

artificial agents there is no concept of a time that extends into past and future. Existing robots operate mainly in the "now" of their environment, without being aware of the long and short term changes occurring in the dynamic world.

Despite the fundamental role of time in natural cognition, current endeavors in the development of robotic intelligence are by no means directed towards encompassing time processing in the systems' repertoire of capacities. This is really surprising given the extensive inspiration that robotic community has taken from the cognitive modalities of the brain during the last decade. Even if robotic capacities are surprisingly efficient in accomplishing behavioral tasks such as navigate following complex maps, grasp and manipulate objects, etc., artificial agents lack the ability to place their behaviors in a more general context seamlessly integrated with human activities.

The present work aims to reveal the lack of time processing skills in artificial cognitive systems, to discuss the fundamental role of time in developing intelligent and social behaviors, as well as to direct research attention on furnishing artificial cognitive systems with the ability to experience and process time.

Temporal Cognition

For humans and animals, sensing and knowing the world arises through spatiotemporal experiences and interpretations. This means that not only spatial information but also time has a crucial role in cognition. In the present article, we use Temporal Cognition as an umbrella term describing the set of cognitive functions that support the broad range of our time experiences. Formally speaking, we define TC as follows:

> ***Definition.*** *Temporal Cognition encompasses the set of brain functions that enable experiencing the flow of time and processing the temporal characteristics of real world phenomena, accomplishing (i) the perception of synchrony and ordering of events, (ii) the formation of the experienced present, (iii) the perception of different temporal granularities, (iv) the conceptual abstraction and processing of durations, (v) the mental travelling in future and past time, (vi) the social sharing of temporal views about the world.*

The above definition indicates that what is important for artificial systems is the holistic exploration of time-relevant cognitive processes. Despite the fact that existing works in cognitive science and neuroscience have mainly followed a decomposing approach considering separately what is the role of time in memory, how we perceive temporal orientation, how time is represented in the brain, what is the role of different temporal granularities, etc., investigating time perception in the context of artificial systems requires a synthetic approach, with the holistic consideration of all TC branches. This is because any implementation decision that will be taken for each of the afore mentioned TC aspects is likely to additionally affect procedures in the other aspects as well.

Interestingly, the newly developed sense of time will provide added value to the existing cognitive capacities of artificial agents enabling them to expand in the "new" time dimension (e.g. attention will shift not only in space but also in time, learning may be more efficient after considering past, etc.).

Time as a perceivable physical entity

Discussions of the nature of time, have frequently attracted scientific interest throughout the years, from Aristoteles, Newton and Einstein, to many other modern philosophers and researchers. There are now many (complementary) definitions of what is time, and providing yet another definition, is out of the scope of the present article. What is important here to note, is the fact that time is a unique physical entity that is perceived by living organisms. Time provides the framework to sense and record changes in the environment, as well as to act on the world in order to affect its state. Along this line, considering time provides a practical convenience in modern human societies with numerous time-relevant standards being set up, allowing people to keep their lives running smoothly.

Moreover, time is considered one of the fundamental quantities used to perceive and measure world states in the International System of Units. As a result, to adequately perceive and understand our physical world, intelligent artificial systems should able to monitor the flow of time and integrate it with their perceptions and actions.

Of course, time is not what clock measures. This is because clocks do not implement time, but they just provide a means to measure it. The flow of time will certainly continue being a key parameter in the evolution of our world, even if we break all clocks existing on earth. Therefore, the equipment of artificial systems with a clock is not enough for perceiving and processing time in a way comparable to humans. A specialized cognitive capacity is required to provide meaning on the sequence of time measures and combine them with the observed changes on the world. This capacity is described with the term Temporal Cognition in the present document.

Time as a regulator of cognition

All cognitive processes are integrated with a critical when factor. In other words they are entimed on a particular time period that accompanies their validity. Outside this period, they are not valid any more. Besides the validity of specific statements, cognitive processes that regard multiple asynchronous events/processes require a framework that enables examining associative relationships.

All our perceptions and actions make key associations with temporal features that affect our cognition. This means, our behaviors are modulated by the temporal properties of the world and it is very likely that our behaviors would be different if these temporal properties were also different. As it is commented by Wilson, time pressure plays a key role in choosing and expressing a given action (Wilson, 2002). If there was no pressure we may have selected a different behavior, or we may have executed the same action differently. This highlights how our instant experiences modulate our thinking.

Of course, cognition is not only related to the here and now of the world but can also span in multiple points or periods of time. Similar to the well known "embodiment" (Pfeifer & Scheier, 1999) that highlight how situatedness – i.e. the experience of the current world state – affects cognition, we use the term "entiment" to describe how the association of cognitive processes with different moments in the past, present and future, plays a key role in shaping cognition. For example, by taking a particular strategic decision, we expect

the occurrence of specific events at specific times in the future. This expands the entiment of our current decision not only in the present but also in the future.

The entiment of cognitive processes is also important for organizing our social life. Consider for example a discussion that we may have with friends about the political events and the music of 60s. In such a scenario, we and our friends mentally travel back in time, focusing on a particular time period (i.e. our attention is shifted not only in space, but also in time). All persons participating in the discussion need to develop a common understanding about the period we are talking about. If someone will mention (by mistake) an event of 70s, we will most likely identify this conflict, correcting our partner that his mind has moved outside the period of interest (i.e. outside of the 60s decade). Therefore, we not only situate our personal thoughts in time, but in order to efficiently communicate and socialize we perceive how others entime their thoughts and activities. Another common example that reveals the fundamental role of time in the organization of social life regards our ability to make plans accomplishing to coordinate our own free time with the free time of our friends.

Interestingly our last examples show that, when implementing sophisticated thoughts, parts of our cognitive processes may be entimed differently on the time-line (e.g. while discussing in the present we recall and keep track of past events). This feature is particularly important for implementing high level cognitive skills that are typically less related with the here and now of the world. Temporal cognition provides the framework that enables the association of time-distant percepts, behaviors and emotions and thus provides the basis for implementing particularly complex and sophisticated thoughts.

Overall, the entiment of cognitive processes is a key ingredient for human intelligence and thus, if we are going to ever implement intelligent robots seamlessly interacting with humans, such robots will be equipped with advanced, human-like TC.

Temporal Cognition Brain Mechanisms

The different aspects of TC listed in the above definition develop gradually in humans starting from the late infancy (at about the age of 12 months) when primitive ability to experience the flow of time is obtained (Arterbery, 1993), continue during childhood implementing the ability to think of future at about the age of 4 (Atance and Jackson, 2009), and become fully mature to adult-like levels by the age of 12 (Droit-Volet et al., 2006). Interestingly, TC capacity has been reported to migrate in our brain during development. More specifically, (Smith et al., 2011) has demonstrated age-dependent developmentally disassociated neural networks for time discrimination.

The investigation of the brain mechanisms involved in the perception and processing of time has attracted significant research interest in brain science during the last decade. Contemporary review papers and special journal issues have summarized the new and burgeoning scientific findings in the field (Meck, 2005; Crystal, 2007; Ivry & Schlerf, 2008; Wittmann & van Wassenhove, 2009). It is now well established that, despite the fundamental role of time in our life, there is no region in our brain that is solely devoted to the sense of time (this contrasts to the exclusive representation of audition, vision, touch, proprioception, taste, and other senses in specific cortical regions). However, over the past decade, a number of different brain areas have been implicated to contribute in time-

experiencing including (among others),the cerebellum, right posterior parietal cortex, right prefrontal cortex, fronto-striatal circuits, and insular cortex for duration perception (Lewis & Miall, 2003; Hinton & Meck, 2004; Bueti et al., 2008; Ivry & Schlerf, 2008; Wittmann, 2009), the inferior frontal and superior temporal lobes, hippocampus, medial prefrontal, medial parietal and posterior cingulated cortex for past–future distinction, and mental time travel (Botzung et al., 2008; Suddendorf et al., 2009; Viard et al., 2011), the prefrontal, inferior parietal cortex, superior colliculus and insular cortex for synchronous, and asynchronous event distinction (Dhamala et al., 2007; Kavounoudias et al., 2008), the posterior sylvian regions, posterior parietal, and temporo-parietal networks for temporal order judgment (Woo et al., 2009; Bernasconi et al., 2010; Kimura et al., 2010). The involvement of many brain areas in TC is explained by the significant contribution of multiple cognitive processes such as attention, working-memory, decision making, emotions, etc., in experiencing and processing time (Livesey et al., 2007). Therefore, slight perturbations on these processes may affect our time experiences, explaining why subjective time (how each one of us is perceiving the flow of time) is in principle different than the objective, physical time (Searle, 1992). The aforementioned highly distributed network of brain areas that supports TC suggests that the sense of time relies on, and possibly emerges from, multi-modal cortical interactions. In-line with this, it has been recently suggested that time perception plays an important role in the fusion of perceptuo-motor information throughout the cortex, and the accomplishment of complex cognitive tasks (van Wassenhove, 2009).

A new generation of robotic systems

In order to achieve natural human-like performance, robotic systems need to incorporate the fundamental cognitive skills of biological agents. It is now known that apart from humans, many animals such as monkeys (Medina et al., 2005), rats (Guilhardi et al., 2005), and even zebra-fish (Sumbre et al., 2008), are capable of processing time. Therefore, it seems likely that time perception is a prerequisite for intelligent behavior and it is now high time to direct the attention of the robotics researchers on the investigation of artificial TC (Maniadakis et al. 2009, Maniadakis & Trahanias, 2011, Maniadakis & Trahanias, 2012).

In practical terms, we can identify at least three dimensions in which TC can improve robotic cognition:

- Advance internal cognitive processes: There are many mechanisms with an important role in shaping cognitive dynamics, such as learning, memorization, forgetting, attention, association, and others, that can significantly benefit by considering temporal information. For example, new learning algorithms may be implemented that consider the details of past events when adjusting decision making procedures, time-based association mechanisms may be used to enable future conflict prediction, while directing attention on a particular time period in the past will enable considering relations between a specific set of events.
- Develop skills dealing with the manipulation of time: Artificial TC will provide robotic agents with the capacity to process all different aspects that time is involved in our daily life, accomplishing tasks which are currently out of their scope. For example,

robots may be capable of (i) synchronizing with natural human actions (currently humans are mainly synchronized to robots); (ii) abstracting and categorizing the time scales required for the evolution of different processes; (iii) being aware of the temporal order of their own experiences; (iv) considering the causal relationship linking the present and future with past events that may have occurred many hours or days ago, and others.

- Develop skills that implicitly involve time processing : Time is an important parameter for many low and high-level skills. This is because even simple actions (e.g., object grasping) include a critical "when" component (Battelli et al., 2008) that links a given behavior with the ongoing real world processes. Moreover, high-level cognition that is typically less related with the here and now of the world, requires the association and reasoning on events that occurred, or will occur at different times (e.g., mind reading links past knowledge with future actions). Therefore, both low and high-level cognitive skills can gain significant efficiency through artificial TC.

Implementing artificial temporal cognition

Addressing artificial TC for robotic systems is a most challenging research endeavor. This is partly due to the fact that the capacity to experience and process time has to be seamlessly and effectively integrated with the already implemented robotic skills. Undoubtedly, the latter is affected by the computational approach adopted for implementing TC, which is critical for maximizing the benefits that cognitive systems will gain from this new computational modality. Broadly speaking we can identify two main approaches for equipping robots with TC.

The first approach relies on artificial intelligence (AI) methods that accomplish time-dedicated processing, e.g., temporal logic, or event calculus (Brandano, 2001; Fisher et al., 2005). Noticeably, despite the extensive experience that exists with such systems, the latter are rarely employed in robot implementations, which is because the robotics community has not adequately appreciated the role of time in cognition. Typically AI approaches treat time as an isolated piece of information that can be directly obtained by computer clocks for labeling events and subsequently processed through dedicated mathematical procedures. A significant advantage for the underlying approach is the extensive know-how already obtained, which can be readily employed to facilitate the processing of time. However, getting a bunch of measurements from a robots clock is far from efficiently incorporating time in the cognitive loop of artificial agents. This is because AI approaches result in compact implementations, meaning that TC will operate as a rather separate module of the overall cognitive system, being minimally affected by other cognitive processes. Clearly, such a module for experiencing, representing and processing time can hardly parallelize with the known TC brain processes where there is no time-dedicated region and time-experiencing emerges from the interaction of sensory, motor, cognitive, and emotional modalities (Wittmann & van Wassenhove, 2009). Moreover, the use of clocks, is only one aspect of time processing that does not guarantee TC capacity (in fact, humans develop TC before being capable to use clocks, while animals that also perceive and process time cannot of course use clocks at all!). In a broader sense, we note here that the "good old fashioned AI" approaches have been criticized in many ways by the robotics community

(Wilson, 2002; Steels, 2003). It is now widely accepted that temporal and other logics can deal with only a limited set of real world circumstances (Pfeifer and Scheier, 1999), and it seems unlikely that they can support the development of near-natural intelligence in artificial systems.

The second alternative approach aims at the computational replication of the TC working principles of the human brain. Such an approach assumes collaboration between robotic and brain science communities to abstract the neural mechanisms accomplishing TC and implement their computational counterparts in artificial cognitive systems. Evidently, the brain-inspired approach has high potential to result into artificial cognitive systems equipped with human competent TC. At the same time, due to the complexity and the highly distributed nature of biological TC mechanisms, this approach fosters the revealing of the brain working principles. Extensive testing of the implemented models may facilitate the in silico investigation of TC processes, providing valuable feedback to brain science regarding time processing functions and their role in cognition (e.g., by offering a valid computational test-bed where alternative theories may be evaluated).

To simulate the highly distributed network of brain areas supporting TC, computational modules having both temporal and other cognitive functional responsibilities need to be implemented. The connectivity of such modules that will assimilate the connectivity of brain areas will base on transfer components that should monitor, extract and forward either temporal or other ordinary cognitive information. The implementation of a large scale brain-inspired system will exploit the interaction between cognitive modalities accomplishing the fusion of sensory information and the temporal association of knowledge items, therefore providing added value to the already implemented perceptual, motor, cognitive, and emotional robotic capacities. This type of "entiment" of cognitive processes (i.e. their placement in time) will facilitate the association of past, present and future events, enabling the administration of particularly complex thoughts. Interestingly, due to the crucial role of time in many high-level and social cognitive skills, such as cause attribution, prospective memory, executive control, mind reading, multi-agent planning, and others, the equipment of artificial systems with TC will enable the aforementioned skills to develop in robotic agents.

Conclusions

As it is argued throughout the paper, temporal cognition is not an optional extra but a necessity towards the development of truly autonomous and intelligent machines. Temporal cognition is a vital capacity that enables the processing of the well defined physical concept of time and additionally the entiment of other cognitive modalities into the real world. The latter facilitates the binding of cognitive modalities into a complex whole that effectively accomplishes high-level cognition.

Still, in the field of robotics, the key role of time in cognition is not adequately considered in contemporary research. Without any doubt, it is now high time to direct research efforts on the exploration of robotic time perception and processing abilities. This will be a significant milestone in bridging the gap between human and artificial cognition.

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