A Happier and Less Sinister Past, a More Hedonistic and Less Fatalistic Present and a more Structured Future: Time Perspective and Well-Being
journal article
2014-02-12
en

A Happier and Less Sinister Past, a More Hedonistic and Less Fatalistic Present and a more Structured Future: Time Perspective and Well-Being

Background: Previous studies have established a link between how people relate to their past, present, and future (i.e., time perspective) and subjective well-being (i.e., life satisfaction, positive and negative affect). Time perspective comprises five dimensions: Past Positive, Past Negative, Present Hedonistic, Present Fatalistic, and Future. Life satisfaction can also be evaluated in relation to different time frames. Moreover, approach related positive affect is associated to a different concept of well-being labeled psychological well-being. In the present study we extend previous findings by investigating the effect of time perspective on the time frame of evaluations of life satisfaction (past, present, future) and by investigating the relationship between time perspective and psychological well-being.

Method: Questionnaires on time perspective (Zimbardo's Time Perspective Inventory), temporal life satisfaction (Temporal Satisfaction with Life Scale), affect (Positive Affect and Negative Affect Schedule), and psychological well-being (Scales of Psychological Well-Being - short version) were answered by 453 individuals. Two different structural equation models were tested, one of the relationship between time perspective and temporal life satisfaction, and the other of the relationship between time perspective, affect and psychological well-being.

Results: Time perspective affected life satisfaction depending on the time scale on which it was evaluated—memory of a negative past influenced life satisfaction in all time frames, and a positive view of the past influenced both past and future life satisfaction. Moreover, less rumination about past negative events (i.e., low score on Past Negative), the tendency to take risks in the present to achieve happy feelings and/or avoid boredom (i.e., high scores on Present Hedonistic), and a less hopeless and pessimistic view about the present (low scores

on Present Fatalistic) were associated with higher levels of psychological well-being and positive affect. These same time perspective dimensions were associated with lower levels of negative affect. The Future time perspective dimension (i.e., approaching life with self-control, punctuality, and planning for the future) was associated with both psychological well-being and positive affect.

Conclusions: High levels of both subjective and psychological well-being are related to a happier and a less sinister past, a more hedonistic and less fatalistic present, as well as to a more structured future.

2 **A Happier and Less Sinister Past, a More Hedonistic and Less Fatalistic Present and a more**

3 **Structured Future: Time Perspective and Well-Being**

4 Uta Sailer[1, 2], Patricia Rosenberg[2], Ali Al Nima[1, 2], Amelie Gamble[1], Tommy Gärling[1], Trevor

5 Archer[1, 2], Danilo Garcia[2, 3]*

[1]Department of Psychology, University of Gothenburg, Göteborg, Sweden

[2]Network for Empowerment and Well-Being, Sweden

6 [3]Center for Ethics, Law and Mental Health (CELAM), University of Gothenburg, Göteborg,

7 Sweden

8 * Correspondence concerning this article should be addressed to D. Garcia, CELAM, University

9 of Gothenburg, Wallinsgatan 8, SE 431 41 Mölndal, Sweden. E-mail:

10 danilo.garcia@neuro.gu.se; danilo.garcia@euromail.se.

11 **Introduction**

12 In order to make sense of them humans anchor events and experiences in time. For example, they

13 may use previous instances of an event to predict its occurrence in the future. Zimbardo and

14 colleagues (e.g., Zimbardo, 2008; Zimbardo & Boyd, 1999) have developed a model of how

15 people organize and apprehend time. Their time-perspective model consists of five dimensions:

16 (i) Past Positive reflecting a sentimental and positive view of the past; (ii) Past Negative which

17 reflects a pessimistic attitude toward the past; (iii) Present Hedonistic reflecting the desire of

18 experiencing pleasure with slight concern for future consequences; (iv) Present Fatalistic which

19 reflects a lack of hope and control for the future, and; (v) Future which reflects the ability to find

20 reward in achieving specific long-term goals. Time perspective is expected to influence attitudes,

21 behaviour and goals.

22   Empirically it has been shown that time perspective predicts the reported use of alcohol,

23 drug, and tobacco (Keough, Zimbardo & Boyd, 1999), risky driving (Zimbardo, Keough & Boyd,

24 1997), indecision and avoidant procrastinations (Diaz-Morales, Ferrari & Cohen, 2008),

25 environmental engagement (Milfont, Wilson & Diniz, 2012), the choice of food and of partner,

26 educational achievement, and the distinctness of future goals (Zimbardo & Boyd 1999). Time

27 perspective is also related to mood. As an example, negative views of the past have been reported

28 to be associated with depression, whereas positive views of the past have been reported to be

29 associated with happiness (Zimbardo & Boyd 1999; see also Stolarski, Matthews, Postek,

30 Zimbardo & Bitner, 2013). The influence of a past-oriented time perspective may be explained by

31 that episodic-memory retrieval influences how people imagine and simulate future events

32 (Schacter & Addis, 2007abc). This view is supported by that the retrieval of past events and the

33 imagination of future events involve overlapping neural regions (Addis, Wong & Schacter, 2007,

34 Szpunar, Watson & McDermott, 2007).

35   Subjective well-being or happiness is defined as a person's cognitive and affective

36   evaluations of her/his life (Diener, Lucas & Oishi, 2002). It is influenced both by judgments of

37   life satisfaction and fulfillment as well as the balance between the frequency and intensity (or

38   duration) of positive emotions and moods and the frequency and intensity (or duration) of

39   negative emotions and moods. Life-satisfaction judgments are believed to be based on memory of

40   current and previous life experiences that cause evaluative and emotional reactions (Kim-Prieto,

41   Diener, Tamir, Scollon & Diener, 2005).

42   Previous research suggests that subjective well-being may be critically related to time

43   perspective. Thus, Zimbardo and Boyd (1999) proposed that a 'balanced time perspective' is

44   important for optimal functioning. This implies an ability to simultaneously evaluate past,

45   present, and future time perspectives in a flexible manner. In accordance with Zimbardo and

46   Boyd's (1999) assumption, individuals with such a balanced time perspective report larger

47   happiness (Drake, Duncan, Sutherland, Abernethy & Henry, 2008). Furthermore, subjective well-

48   being is higher for individuals with a positive view of the present and past than for individuals

49   with a negative view of the past (Zhang and Howell, 2011). Whereas these studies demonstrate an

50   effect of time perspective on subjective well-being, it is not known whether this effect also

51   depends on the time frame (past, present and future) in which individuals evaluate their well-

52   being. Moreover, life-satisfaction judgments may be interrelated, that is, that past life satisfaction

53   is related to present and future life satisfaction (Kim-Prieto et al., 2005; Garcia, Rosenberg &

54   Siddiqui, 2011).

55   Arguing that well-being goes beyond happiness and satisfaction with life, Ryff (1989)

56   proposed the concept of psychological well-being—while subjective well-being focuses on the

57   pursue of happiness and a pleasant life, psychological well-being targets the fulfillment of human

58   potential and a meaningful life even in the face of challenges and adversities (Ryan & Deci,

59   2001). Psychological well-being is conceptualized as containing six dimensions: self-acceptance

60   (i.e., the ability to accept all parts of the self), personal growth (i.e., seeing life as an opportunity

61   to develop), purpose in life (i.e., having a sense of meaning in life), environmental mastery (i.e.,

62   the sense of having control in one's life), autonomy (i.e., the sense of self-directedness), and

63   positive relations with others (i.e., the ability of establishing and keeping warmth, close, and

64   trustful relations with others). Thus, psychological well-being has a wider focus on the

65   achievement of full psychological potential and functioning. This concept has still been found to

66   be strongly related to subjective well-being (Compton, Smith, Cornish, & Qualls, 1996). Urry

67   and colleagues (2004), for example, investigated correlations between individual differences in

68   baseline prefrontal activation and psychological well-being. They found that affect, especially

69   approach-related positive affect (e.g., feeling ''interested'' or ''strong''), is related to

70   psychological well-being (engaging with goal-directed stimuli). Hence, psychological well-being,

71   as well as positive affect, seems to have an orientation towards the future. The concept of

72   approach-related positive affect is, for instance, related to Gray's (1981) Behavioural Activation

73   System or sensitivity to reward as well as approach motivation, while negative affect is related to

74   the Behavioural Inhibition System or sensitivity to punishment as well as avoidance motivation.

75   Moreover, recent research (Garcia, 2013) has found that individuals with high levels of

76   psychological well-being recall more positive than negative memories from the past. How

77   individuals relate to the past may also be related to their own self-acceptance, personal growth,

78   purpose in life, environmental mastery, autonomy, and ability to create positive relations with

79   others.

80   ***The present study***

81   Only one study has explored Zimbardo's time perspective model and temporal judgments of life

82   satisfaction (Boniwell, Osin, Linley & Ivanchenko, 2010). This study used the instrument

83   developed to measure temporal variations of life satisfaction (e.g., Temporal Satisfaction With

84   Life Scale; Pavot, Diener, & Suh, 1998) that will also be used in the present study. Moreover, the

85 present study aims to close another knowledge gap in the literature, namely how different time

86 perspective dimensions are related to psychological well-being. Ryff's multidimensional model

87 of psychological well-being is a point of departure in the present study, which although related it

88 is conceptually different to subjective well-being (Kjell, Nima, Sikström, Archer & Garcia,

89 2013).

90   As detailed in the introduction, temporal satisfaction with life seems to be an interrelated

91 construct, that is, past life satisfaction is related to present and future life satisfaction and vice

92 versa. Thus, the first aim of the present study is to investigate the relationship between the

93 dimensions of time perspective and temporal life satisfaction taking into account the inter-

94 relation between past, present, and future life satisfaction judgments. The second aim is to

95 investigate the relationship between time perspective dimensions and psychological well-being

96 and affect by taking into account the close relationship between psychological well-being and

97 affect, especially positive affect.

98 **Method**

99 *Ethics statement*

100 Data collection conformed to the Declaration of Helsinki and the Ethics Committee of the

101 University of Gothenburg approved the research protocol. Verbal informed consent was obtained

102 from all the study participants as agreed by the review board.

103 *Participants and procedure*

104 The data were collected among 400 undergraduate students at an University in the West of

105 Sweden (from which we obtained 324 valid responses corresponding to a 81% response rate) and

106 at a training facility, a gym complex for weight and aerobic training, in the South of Sweden ($N =$

107 158 from which we obtained 129 valid responses corresponding to a .82% response rate). The

108 data collected at the training facility was supported by a grant from The Swedish National Centre

109 for Research in Sports (Grant nr. P2012-0097). A total of 453 individuals participated in the study

110 (148 males and 300 females, 5 who failed to report their gender, *mean* age 29.74 years *SD* =

111 12.86 years). All participants were informed that their participation was voluntary and

112 anonymous. They were presented with a battery of instruments used to collect the relevant

113 measures in the following order: background, time perspective, temporal satisfaction with life,

114 psychological well-being, and affect. Although randomizing the order in which the instruments

115 are presented to participants is suggested to ensure no order effects (Lavrakas, 2008) this was not

116 practically possible to do in both samples. While the university group answered a paper and

117 pencil version of the instruments, the gym group answered an online version by receiving a link

118 to their email addresses and asked to answer the questionnaires in the tranquility of their homes.

119 The gym group also differed in that those who participated received a cinema ticket for their

120 collaboration, whereas no compensation was offered to the undergraduate group.

121 ***Measures***

122 *Background and Health questionnaire (Karlsson & Archer, 2007).* This instrument was applied to

123 collect background data providing health and health-related information about each participant.

124 The questionnaire consists of items pertaining to age, gender, education, sleeping problems,

125 propensity to perform regular physical exercise, and use of psychotropic drugs.

126 *Time Perspective*. The Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999)

127 consists of 56 items that measure the following five time dimensions: Past Positive (e.g., "It gives

128 me pleasure to think about my past"), Past Negative (e.g., "I think about the good things that I

129 have missed out on in my life"), Present Hedonistic (e.g., "Taking risks keeps my life from

130 becoming boring"), Present Fatalistic (e.g., "Fate determines much in my life"), and Future (e.g.,

131 "I believe that a person's day should be planned ahead each morning"). The Swedish version has

132 been used and validated in previous studies (Carelli, Wiberg & Wiberg, 2011; Wiberg, Sircova,

133 Wiberg & Carelli, 2012) and its psychometric properties validated in many different languages,

134 such as, Portuguese (Milfont, Andrade, Belo & Pessoa, 2008), Lithuanian (Liniauskaite & Kairys,

135   2009), and Spanish (Díaz-Morales, 2006). The Cronbach's αs in the present study were: .81 for

136   Past Positive, .87 for Past Negative, .81 for Present Hedonistic, .68 for Present Fatalistic, and .77

137   for Future.

138   *Temporal Life Satisfaction*. The Temporal Satisfaction With Life Scale (Pavot, Diener &

139   Suh, 1998) comprises 15-items rated on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly*

140   *agree*) organized in three subscales assessing past (e.g., If I had my past to live over, I would

141   change nothing), present (e.g., I would change nothing about my current life), and future life

142   satisfaction (e.g., There will be nothing that I will want to change about my future). The

143   Cronbach's α in the present study were: .86 for the past subscale, .93 for the present subscale, and

144   .88 for the future subscale.

145   *Affect.* The Positive Affect and Negative Affect Schedule (Watson, Clark & Tellegen,

146   1988) assesses the affective component of subjective well-being by requiring participants to rate

147   on 5-point adjective scales to what extent (1 = *very slightly*, 5 = *extremely*) during the last few

148   weeks they experienced 10 positive and 10 negative affect. The positive affect scale includes

149   adjectives such as strong, proud, and interested; and the negative affect scale includes adjectives

150   such as afraid, ashamed, and nervous. The Swedish version has been used in previous studies

151   (e.g., Garcia & Erlandsson, 2011; Nima, Archer & Garcia, 2012, 2013; Nima, Rosenberg, Archer

152   & Garcia, 2013; Schütz, Archer & Garcia, 2013a, 2014). The Cronbach's αs in the present study

153   were for positive affect .88 and for negative affect .84.

154   *Psychological Well-Being*. The Scales of Psychological Well-Being-short version (Clarke,

155   Marshall, Ryff & Wheaton, 2001) comprises 18 items including 3 items for each of the six

156   dimensions. These dimensions are: self-acceptance (e.g., "I like most aspects of my personality"),

157   personal growth (e.g., "For me, life has been a continuous process of learning, changing, and

158   growth"), purpose in life ("Some people wander aimlessly through life, but I am not one of

159   them"), environmental mastery (e.g., " I am quite good at managing the responsibilities of my

160   daily life"), autonomy (e.g., "I have confidence in my own opinions, even if they are contrary to

161   the general consensus"), and positive relations with others (e.g., "People would describe me as a

162   giving person, willing to share my time with others"). The Swedish version has been used in

163   previous studies (e.g., Garcia, 2011; Garcia & Siddiqui, 2009). Since the subscales have been

164   found to have low reliability, the total psychological well-being score (i.e., the sum of the 18

165   items) is recommended as a better and more reliable measure (Garcia & Siddiqui, 2009). A

166   Cronbach's α of .83 was in the present study obtained for the total psychological well-being

167   score.

168   ***Statistical treatment***

169   In order to determine whether both samples could be pooled, we first conducted an independent

170   *t-test* between the two groups (undergraduate and gym participants) using the background

171   variables (i.e., education, sleeping problems, exercise frequency, and use of psychotropic drugs)

172   as the dependent variables. We assumed that non-significant differences between the samples in

173   most of these variables would justify pooling them. The results showed that the groups only

174   differed on exercise frequency ($t = 4.65$, $df = 451$, $p < .001$), the gym group reporting exercising

175   more frequently ($M = 4.06$) than the undergraduate group (M = 3.59). Since there were no

176   differences in the other variables, all subsequent analyses were conducted on the whole sample

177   ($N = 453$).

178   We used the Expectation-Maximization Algorithm (EM-Algorithm) to impute missing

179   values. *Little's Chi-Square* test for Missing Completely at Random showed a $\chi^2=67.25$ ($df =$

180   53, $p= .09$) for men and $\chi^2 =77.65$ ($df = 72$, $p= .31$) for women. Thus, the EM-Algorithm was

181   suitable to use. Table 1 shows the Pearson's correlations and inter-correlations between all

182   variables. There are significant correlations between many of the variables, which potentially

183   introduces multicollinearity. Thus, the data were analysed using Structural Equation Modeling

184   (SEM) in order to control for error measurement and collinearity among variables. Based on our

185   research questions we conducted two SEM models, one of the relationship between time

186   perspective and temporal satisfaction (Satisfaction Model) and the other one of the relationship

187   between time perspective and both affect and psychological well-being (PANA and PWB model).

188   Kurtosis and skewness values for all variables in the first (highest kurtosis value = .77; highest

189   skewness value = -.65) and in the second SEM model (highest kurtosis value .77; highest

190   skewness value .75) were within acceptable ranges.

191   Table 1 should be about here

192   The *chi-square* value was significant for the Satisfaction Model (Chi^2 = 3.96, *df*= 1, *p* = .

193   047). However, it is known that the chi square statistic is heavily influenced by sample size

194   (Kline 2010) such that larger samples have a higher likelihood of being significant. Since other

195   measures of fit suggested a good model fit (see below), we considered that the Satisfaction Model

196   was acceptable.

197   The *chi-square* value for the PANA and PWB Model was strongly significant (Chi^2 =

198   126.04 *df*= 3, *p*< .001) suggesting that the model did not fit the data to an acceptable degree.

199   After modifying the model by adding covariances between errors, the chi-square value of the

200   PANA and PWB Model was found to be acceptable (Chi^2 = 3.85, *df*= 1, *p* = .05). Corroborating

201   evidence is provided by the *Root Mean Square Error of Approximation* fit statistic that was below

202   0.10 (Satisfaction Model: .08 and PANA and PWB Model: .08) indicating a reasonable fit

203   (Browne & Cudeck, 1993). The *incremental fit index* (Bollen, 1989) indicated that the model fit

204   was acceptable (Satisfaction Model: 1.00 and PANA and PWB Model: 1.00). Finally, the *Bentler-*

205   *Bonett Normed Fit Indices* (Bentler & Bonett, 1980) also indicated that the model fit was

206   acceptable (Satisfaction Model: 1.00 and PANA and PWB Model: 1.00).

207   **Results**

208 The first SEM model was theoretically based on the relationship between the dimensions of

209 temporal life satisfaction (past, present, and future; see Kim-Prieto et al., 2005) and the

210 independency of this construct of subjective well-being (Diener, Lucas & Oishi, 2002). This first

211 model (Satisfaction Model), was conducted to investigate which time perspective dimensions

212 influence temporal life satisfaction using some modifications (i.e., regression weights from past

213 life satisfaction to present life satisfaction and from present life satisfaction to future life

214 satisfaction) to obtain a better fitting for this model. The second model was based on the relation

215 between affectivity measured by the Positive Affect and Negative Affect Schedule and

216 psychological well-being (Urry et al., 2004). This model (PANA and PWB Model) was

217 conducted to investigate which perspective dimensions influence affect and psychological well-

218 being. The possible covariances for the five time perspective dimensions are taken into account in

219 both models.

220   The results of the Satisfaction Model showed that the Past Positive ($\beta = .38, p < .001$)

221 time perspective dimension predicted past life satisfaction, while the Past Negative dimension

222 significantly counterpredicted past life satisfaction ($\beta = -.49, p =< .001$). Present life satisfaction

223 was predicted by the Present Hedonistic ($\beta = .14, p < .001$) and counterpredicted by the Past

224 Negative ($\beta = -.38, p < .001$) time perspective dimensions. Present life satisfaction was also

225 predicted by past life satisfaction ($\beta = .17, p = .002$). Future life satisfaction was predicted by the

226 Past Positive ($\beta = .12, p = .005$), the Present Hedonistic ($\beta = .11, p = .007$), and the Future ($\beta = .$

227 $09, p = .03$) time perspective dimensions. Present life satisfaction was also involved in the

228 prediction of future life satisfaction ($\beta = .43, p < .001$), while the Past Negative dimension

229 counterpredicted future life satisfaction ($\beta = -.12, p = .020$). The whole model yielded a $R^2 = .31$

230 for past life satisfaction, .33 for present life satisfaction, and .33 for future life satisfaction. See

231 Figure 1 and Table 2 for the details.

232   Figure 1 should be about here

233   The results of the PANA and PWB Model showed that positive affect was predicted by

234   the Present Hedonistic (β = .28, p < .001), and the Future (β = .23, p < .001) time perspective

235   dimensions, while the Past Negative (β = -.22, p < .001) and the Present Fatalistic (β = -.24, p < .

236   001) dimensions counterpredicted positive affect. Negative affect was predicted by the Past

237   Negative (β = .53, p < .001) and the Present Fatalistic (β = .09, p =.03) time perspective

238   dimensions, while the Present Hedonistic (β = -.10, p = .01) dimension counterpredicted negative

239   affect. The whole model yielded a R^2 = .25 for positive affect and .36 for negative affect. See

240   Figure 2 and Table 2 for the details. The results of this model also showed that psychological

241   well-being was predicted by all five time perspective dimensions. Specifically, the Past Positive

242   (β = .20, p < .001), the Present Hedonistic (β = .21, p < .001), and the Future (β = .09, p = .010)

243   time perspective dimensions, while the Past Negative (β = -.43, p < .001) and the Present

244   Fatalistic (β = -.24, p < .001) dimensions counterpredicted psychological well-being. The whole

245   model showed an R^2 = .46 for psychological well-being. See Figure 2 and Table 2 for the details.

246   Figure 2 should be about here

247   Table 2 should be about here

248   Since the results suggested that past positive and past negative time perspective

249   contributed differently to psychological well-being, the two correlation coefficients (.41 and -.58)

250   were Fisher-transformed and then compared with each other using a z-test (Steiger 1980). This

251   analysis was performed in order to investigate which of the correlations was stronger. The

252   correlation between past negative and psychological well-being was found to be significantly

253   higher than that for past positive and psychological well-being (z= 17.43 , p<.001).

254   **Discussion**

255   The aim of the present study was to investigate the relationship between time perspective

256   dimensions and temporal satisfaction with life, affect, and psychological well-being. As expected,

257   satisfaction with past life was related to past perspective (i.e., Past Positive and Past Negative).

258   This is understandable since individuals who report feeling pleasure, nostalgia, and happiness

259   when recalling the past (i.e., Past Positive) should report feeling more satisfied with their past

260   life. Likewise, rumination of bad moments from the past and generalization of bad past outcomes

261   to the present and to the self (i.e., Past Negative) ought to predict lower satisfaction with the past.

262   This is, for instance, related to research on explanatory style—individuals who internalize and

263   interpret past negative events as long-lasting and associated to all aspects of their life are prone to

264   depression (Buchanan & Seligman, 1995). Present life satisfaction was predicted by the tendency

265   to take risks in order to achieve more positive emotions or avoid boredom in the present (i.e.,

266   Present Hedonistic). Consistent with previous suggestions (Kim-Prieto et al., 2005; Garcia et al.,

267   2011), present life satisfaction was predicted by how one feels with the past. Satisfaction with the

268   future was, also as expected, predicted by the tendency to plan for the future, goal-setting,

269   punctuality, and meeting deadlines (i.e., the Future time perspective dimension). As in previous

270   studies (Garcia et al., 2011; Pavot et al., 1998), future life satisfaction was also related to

271   individuals' view of the past and the present. However, whereas the view of the past influenced

272   satisfaction also in the present and future, the Present Hedonistic dimension did not influence the

273   view of the past. This suggests that the Present Hedonistic dimension expresses a "here and now"

274   approach to life.

275   In sum, the Past Negative time perspective dimension predicted lower levels of temporal

276   life satisfaction as a whole, the Past Positive time perspective dimension predicted both past and

277   future life satisfaction, and the Present Hedonistic time perspective dimension predicted both

278   present and future life satisfaction (see Figure 3). Our findings extend previous results concerning

279   the relationships between time perspectives and subjective well-being (e.g., Boniwell et al.

280   2010) by specifying in which time frame life satisfaction is evaluated.

281   Figure 3 should be about here

282   We also found that frequently feeling proud, interested, and engaged (i.e. positive affect)

283   was associated with the tendency to take risks in order to achieve more positive emotions or

284   avoid boredom in the present (i.e., the Present Hedonistic time perspective dimension), and

285   approaching behavior related to the Future time perspective dimension. This is in line with

286   suggestions (Sirois, 2014) with regard to the other end of this affect dimension and its relation to

287   procrastination, namely, low positive affect's role in the explanation of why procrastination is

288   associated to less focus on the future. Positive affect, as measured here, is indeed labeled as high

289   activation affect (Russell & Carroll, 1999). Accordingly, Schütz and colleagues (2013b) showed

290   that agentic behavior (i.e., goal-setting, planning for the future, self-control, etcetera) is

291   associated with a self-fulfilling state defined as frequently experiencing high activation positive

292   affect and infrequently experiencing high activation negative affect (see also Garcia, Anckarsäter

293   & Lundström, 2013). In contrast, the Past Negative and the Present Fatalistic time perspective

294   dimensions attenuated positive affect. In other words, having a negative view of the past (i.e.,

295   Past Negative) and feeling hopeless and lacking control were associated with experiencing few

296   positive emotions. Moreover, a negative view of the past (i.e., Past Negative) and present

297   (Present Fatalistic) predicted frequently feeling afraid, nervous and irritated, while a hedonistic

298   present perspective (i.e., Present Hedonistic) attenuated these negative emotions.

299   Finally, psychological well-being was predicted by all time perspective dimensions.

300   Memories of the past as being happy (i.e., Past Positive), taking risks in the present in order to

301   achieve happy feelings and/or avoid boredom (i.e., Present Hedonistic), and a Future time

302   perspective associated to agentic values (i.e., goal-setting, self-control, planning for the future,

303   etcetera) were associated with higher levels of psychological well-being. In contrast, ruminating

304   about negative events (i.e., Past Negative) and a hopeless and pessimistic view about the present

305   (Present Fatalistic) was associated with low levels of psychological well-being. Interestingly, the

306   effect of a Past Negative time perspective on psychological well-being was stronger than the

307   effect of a Past Positive time perspective, thus supporting the view that the psychological effects

308   of negative events are stronger than those of positive events (Baumeister, Catanese & Vohs,

309   2001). Along these lines, whereas a positive view of the past influenced past and future life

310   satisfaction as well as psychological well-being, the effect of a negative view of the past

311   influenced a larger number of variables – in fact on all variables tested. Past Negative affected

312   life satisfaction in all time frames, positive affect, negative affect and psychological well-being.

313   This suggest that in order to improve general well-being, it may be more effective to reduce a

314   Past Negative time perspective than by inducing a Past Positive time perspective. To summarize

315   the results of the second model, Past Negative, Present Hedonistic, and Present Fatalistic time

316   perspectives were related to affect and psychological well-being. The Future time perspective

317   was related to both positive affect and psychological well-being, while the Past Positive time

318   perspective only predicted psychological well-being (see Figure 4).

319   Figure 4 should be about here

320   ***Limitations and suggestions for future research***

321   The present study used self-reports which does not allow us to infer whether or not time

322   perspective causally predicts actual well-being. Ryff's multidimensional approach is, for instance,

323   suggested to describe the fully functional individual (Ryff & Keyes, 1995). Thus, a balanced time

324   perspective (i.e., the ability to hold past, present, and future time perspectives at the same time

325   and to use them flexibly) may be caused by individuals' tendency to accept all parts of her/his

326   personality (i.e., high self-acceptance), see life as an opportunity to develop (i.e., personal

327   growth), have a sense of meaning in life (i.e., purpose in life), have control in life (i.e.,

328   environmental mastery), have autonomy, and establish and keep positive relations with others.

329 Another limitation is the fixed order in which the questionnaires were administered, after all,

330 randomization of the order in which the instruments are presented to participants is suggested to

331 ensure that responses to survey questions are not affected by the order of the instruments

332 (Lavrakas, 2008). Also, we used the total psychological well-being score instead of each of the

333 subscales because the short version used here has been found to have low reliability in previous

334 studies (e.g., Clark et al., 2001, Garcia & Siddiqui, 2009). A more reliable version may help

335 disentangle which time perspective is associated with each psychological well-being dimension.

336 ***Concluding remarks***

337 High levels of both subjective and psychological well-being were found to be related to

338 memories of a happier and less sinister past, a more hedonistic and less pessimistic present, as

339 well as to a more structured future.

340 *"Happiness can be found, even in the darkest of times,*

341 *if one only remembers to turn on the light"*

342 *Albus Dumbledore in Harry Potter and the Prisoner of Azkaban*

343 **Acknowledgements**

344 We would like to thank Björn Mikmar and his most helpful staff at Friskis&Svettis

345 Karlskrona/Ronneby for their collaboration in the collection of the data. We would also like to

346 convey our gratitude to the participants for spending their valuable time answering to the

347 questionnaires, to Erik Lindskär for his help with the data collection, and to Nabeel Abd

348 Algafoor at the University of Mustansiryah, Bagdad, for his statistical advice. Last but not the

349 least we want to thank Sophia Isabella Garcia Rosenberg for her help with Figures 3 and 4.

References

Addis, D. R., Wong, A. T., & Schacter, D. L. (2007). Remembering the past and imagining the

future: Common and distinct neural substrates during event construction and elaboration.

Neuropsychologia, *45*, 1363-1377.

Baumeister, R.F., Catanese, K.R., & Vohs, K.D. (2001). Bad is stronger than good. *Review of*

General Psychology, 5, 323-370.

356   Bentler, P. M., & Bonnet, D. C. (1980). Significance Tests and Goodness of Fit in the Analysis of

357   Covariance. Structures. *Psychological Bulletin*, *88*, 588-606.

358   Bollen, K.A. (1989), *Structural Equations with Latent Variables*, New York: John Wiley & Sons,

359   Inc.

360   Boniwell, I., Osin, E., Linley, P. A., & Ivanchenko, G. V. (2010). A question of balance: Time

361   perspective and well-being in British and Russian samples. *The Journal of Positive*

362   *Psychology: Dedicated to furthering research and promoting good practice*, *5*, 24-40.

363   Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen, &

364   J. S. Long (Eds.), *Testing Structural Equation Models* (pp. 136-162). Newbury Park, CA:

365   Sage.

366   Buchanan, G., M., & Seligman, M. E. P. (1995). *Explanatory Style*. Hillsdale, NJ: Erlbaum.

367   Carelli, M. G., Wiberg, B., & Wiberg, M. (2011). Development and construct validation of the

368   Swedish Zimbardo Time Perspective Inventory. *European Journal of Psychological*

369   *Assessment*, *27*, 220-227.

370   Clarke, P. J., Marshall, V. M., Ryff, C. D., & Wheaton, B. (2001). Measuring psychological well-

371   being in the Canadian study of health and aging. *International Psychogeriatrics, 13*, 79-

372   90.

373   Compton, W. C., Smith, M. L., Cornish, K. A., & Qualls, D. L. (1996). Factor structure of mental

374   health measures. J*ournal of Personality and Social Psychology*, *71*, 406-413.

375   Díaz-Morales, J. F. (2006). Estructura factorial y fiabilidad del Inventario de Perspective

376   Temporal de Zimbardo. *Psicothema*, 18, 565-567.

377   Díaz-Morales, J. F., Ferrari, J. R., & Cohen, J. R. (2008). Indecision and avoidant procrastination:

378   The role of morningness-eveningness and time perspective in chronic delay lifestyles.

379   *Journal of General Psychology, 135*, 228-240.

380   Diener, E., Lucas, R. E. , & Oishi, S. (2002). Subjective well-being: The science of happiness and

381   life satisfaction. In C.R. Snyder & S.J. Lopez (Ed.), *Handbook of Positive Psychology.*

382   Oxford and New York: Oxford University Press.

383   Drake, L., Duncan, E., Sutherland, F., Abernethy, C., & Henry, C. (2008). Time Perspective and

384   Correlates of Well-Being. *Time and Society, 17*, 47–61.

385   Garcia, D (2011). Two Models of Personality and Well-Being among Adolescents. *Personality*

386   *and Individual Differences*, 50, 1208-1212. DOI: 10.1016/j.paid.2011.02.009.

387   Garcia, D. (2013). La vie en Rose: High Levels of Well-Being and Events Inside and Outside

388   Autobiographical Memory. *Journal of Happiness Studies*. DOI: 10.1007/s10902-013-

389   9443-x.

390   Garcia, D., Anckarsäter, H., & Lundström, S. (2013). Self-directedness and Cooperativeness,

391   Psychosocial Dysfunction and Suffering in ESSENCE. *The Scientific World Journal*.

392   DOI: 10.1155/2013/416981.

393   Garcia, D., & Erlandsson, A. (2011). The Relationship between Personality and Subjective Well-

394   Being: Different Association Patterns when Measuring the Affective Component in

395   Frequency and Intensity. *Journal of Happiness Studies*, *12*, 1023–1034. DOI:

396   10.1007/s10902-010-9242-6.

397   Garcia, D., Rosenberg, P., & Siddiqui, A. (2011). Tomorrow I Could Be in Trouble...But The Sun

398   Will Come Out Next Year: The Effect of Temporal Distance on Adolescents' Judgments of

399   Life Satisfaction. *Journal of Adolescence*, *34,* 751–757. DOI:

400   10.1016/j.adolescence.2010.08.006.

401   Garcia, D, & Siddiqui, A. (2009). Adolescents' Psychological Well-Being and Memory for Life

402   Events: Influences on Life Satisfaction with Respect to Temperamental Dispositions.

403   *Journal of Happiness Studies*, *10*,387 – 503. DOI: 10.1007/s10902-008-9096-3.

404 Gray, J. A. (1981). A critique of Eysenck's theory of personality, In H. J. Eysenck (Ed.) *A model*

405   *for personality*. Springer: Berlin.

406 Karlsson, E., & Archer, T. (2007). Relationship between personality characteristics and affect:

407   Gender and affective personality. *Individ- ual Differences Research, 5,* 44-58.

408 Keough, K.A., Zimbardo, P.G., & Boyd, J.N. (1999). Who's smoking, drinking and using drugs?

409   Time perspective as a predictor of substance use. *Basic and Applied Social Psychology*,

410   *21*, 149–164.

411 Kim-Prieto, C., Diener, E., Tamir, M., Scollon, C. N., & Diener, M. (2005). Integrating the

412   Diverse Definitions of Happiness: A Time-Sequential Framework of Subjective Well-

413   Being. *Journal of Happiness Studies*, *6*, 261 - 300.

414 Kjell, O. N. E., Nima, A. A., Sikström, S., Archer, T., & Garcia, D. (2013). Iranian and Swedish

415   Adolescents: Differences in Personality Traits and Well-Being. *PeerJ* 1:e197. DOI:

416   10.7717/peerj.197.

417 Kline, R.B. (2010). Principles and practice of structural equation modeling (3rd ed.). New York:

418   Guilford Press

419 Lavrakas, P. J. (2008). *Encyclopedia of Survey Research Methods*. Sage: London.

420 Liniauskaite, A., & Kairys, A. (2009). The Lithuanian version of the Zimbardo Time Perspective

421   Inventory (ZTPI). *Psichologija*, *40*, 66-87.

422 Milfont, T. L., Andrade, P. R., Belo, R. P., Pessoa, V. S. (2008). Testing Zimbardo Time

423   Perspective Inventory in a Brazilian sample. *Interamerican Journal of Psychology*, *42*,

424   49-58.

425 Milfont, T. L., Wilson, J., & Diniz, P. (2012). Time Perspective and environmental engagement: A

426   meta-analysis. *International Journal of Psychology*, *47*, 325-334.

427 Nima, A. A., Archer, T., & Garcia, D. (2012). Adolescents' happiness-increasing Strategies,

428   Temperament, and Character: Mediation models on Subjective Well-Being. *Health*, *4*,

429   802-810. DOI: 10.4236/health.2012.410124.

430 Nima, A. A., Archer, T., & Garcia, D. (2013). The Happiness-Increasing Strategies Scales in a

431   Sample of Swedish Adolescents. *International Journal of Happiness and Development*, *1*,

432   196–211.

433 Nima, A. A., Rosenberg, P., Archer, T., & Garcia, D. (2013). Anxiety, Affect, Self-Esteem, and

434   Stress: Mediation and Moderation Effects on Depression. *PLoS ONE* 8(9): e73265.

435   DOI:10.1371/journal.pone.0073265.

436 Pavot, W., Diener, E., & Suh, E. (1998). The temporal satisfaction with life scale.*Journal of*

437   *Personality Assessment,2*, 340-354.

438 Russell, J. A., & Carroll, J. M. (1999). On the bipolarity of positive and negative affect.

439   *Psychological Bulletin*, *125*, 3-30.

440 Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on

441   hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166.

442 Ryff, C.D. (1989). Happiness is everything, or is it? Explorations on the meaning of

443   psychological well-being. *Journal of Personality and Social Psychology*, *57*, 1069-1081.

444 Ryff, C. D., & Keyes, C. L. (1995). The structure of psychological well-being revisited. *Journal*

445   *of Personality and Social Psychology*, 69, 719-727.

446 Schacter, D. L., & Addis, D. R. (2007a). The cognitive neuroscience of constructive memory:

447   Remembering the past and imagining the future. *Philosophical Transactions of the Royal*

448   *Society B: Biological Sciences*, *362*, 773–786.

449 Schacter, D. L., & Addis, D. R. (2007b). The ghosts of past and future. *Nature*, *445*, 27.

450 Schacter, D. L., & Addis, D. R. (2007c). On the constructive episodic simulation of past and

451   future events. *Behavioral and Brain Sciences*, *30*, 331–332.

452   Schütz, E., Archer, T. & Garcia, D. (2013a). Character Profiles and Adolescents' Self-reported

453   Happiness. *Personality and Individual Differences*, *54*, 841–844. DOI:

454   10.1016/j.paid.2012.12.020.

455   Schütz, E., Garcia, D., & Archer, T. (2014). Affective State, Stress, and Type A-personality as a

456   Function of Gender and Affective Profiles. *International Journal of Research Studies in*

457   *Psychology*, 3, 51–64. DOI: 10.5861/ijrsp.2013.450

458   Schütz, E., Sailer, U., Nima, A., Rosenberg, P., Andersson Arntén, A-C., Archer, T., & Garcia, D.

459   (2013b). The affective profiles in the USA: happiness, depression, life satisfaction, and

460   happiness- increasing strategies. *PeerJ* 1:e156. DOI 10.7717/peerj.156.

461   Sirois, F. M. (2014). Out of sight, out of time? A meta-analytic investigation of procrastination

462   and time perspective. European Journal of Personality. DOI: 10.1002/per.1947.

463   Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. Psychological

464   Bulletin, 87, 245–251.

465   Stolarski, M., Matthews, G., Postek, S., Zimbardo, P. G., & Bitner, J. (2013). How we feel is a

466   matter of time: Relationships between time perspective and mood. *Journal of Happiness*

467   *Studies*. DOI 10.1007/s10902-013-9450-y.

468   Szpunar, K. K., Watson, J. M., & McDermott, K. B. (2007). Neural substrates of envisioning the

469   future. *Proceedings of the National Academy of Sciences of the United States of America,*

470   *104*, 642–647. doi:10.1073/pnas.0610082104

471   Urry, H. L., Nitschke, J. B., Dolski, I., Jackson, D. C., Dalton, K. M., Mueller, C. J., et al. (2004).

472   Making life worth living: Neural correlates of well-being. *Psychological Science*, *15*,

473   367–372.

474   Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of

475   positive and negative affect: The PANAS scales. *Journal of Personality and Social*

476   *Psychology*, *54*, 1063-1070.

477   Wiberg, M., Sircova, A., Wiberg, B., & Carelli, M. G. (2012). Operationalizing Balanced Time

478   Perspective in a Swedish Sample. *The International Journal of Educational and*

479   *Psychological Assessment*, *12*, 95-107.

480   Zhang, J., & Howell, R. T. (2011). Do time perspectives predict unique variance in life

481   satisfaction beyond personality traits? *Personality and Individual Differences, 50,* 1261–

482   1266.

483   Zimbardo, P.G. (2008). *The time paradox: The new psychology of time that will change your life.*

484   New York: Free Press.

485   Zimbardo, P.G., & Boyd, J.N. (1999). Putting time in perspective: A valid, reliable individual-

486   differences metric. *Journal of Personality and Social psychology*, *77,* 1271–1288.

487   Zimbardo, P.G., Keough, K.A., & Boyd, J.N. (1997). Present time perspective as a predictor of

488   risky driving. *Personality and Individual Differences*, *23*, 1007–1023.

489   **Legends**

490   **Table 1.** Correlations between Time Perspective, Subjective and Psychological Well-Being

491   variables.

492   **Table 2.** Standardized and unstandardized coefficients for both models in the study.

493   **Figure 1.** Structural equation model of time perspective and temporal life satisfaction (i.e., the

494   Satisfaction Model). Showing all inter-correlations for the five time perspective dimensions, all

495   paths from the time perspective dimensions to the three temporal life satisfaction constructs, and

496   their standardized parameter estimates. *Chi-square* = 3.96, *df*= 1, *p* =.047; *comparative fit index* =

497   1.00; *incremental fit index* = 1.00; *normed fit index* = 1.00; *root mean square error of*

498   *approximation* = 0.08.

499   **Figure 2.** Structural equation model of time perspective, psychological well-being and affect (i.e.,

500   the PWB and PANA Model). Showing all inter-correlations for the five time perspective

501   dimensions, all paths from the time perspective dimensions to psychological well-being, positive

502   affect, and negative affect, and their standardized parameter estimates. *Chi-square* =3.85,*df*= 1, *p*

503   =.05; *comparative fit index* = 1.00; *incremental fit index* =1.00; *normed fit index* = 1.00; *root*

504   *mean square error of approximation* = 0.08.

505   **Figure 3.** Summary of the results with regard to the relationships between the different time

506   perspectives and temporal life satisfaction dimensions.

507   **Figure 4.** Summary of the results with regard to the relationships between the different time

508   perspectives, psychological well-being, and affect.

Table 1

Table 1. Correlations between Time Perspective, Subjective and Psychological Well-Being variables.

Table 1. Correlations between Time Perspective, Subjective and Psychological Well-Being variables.

	1	2	3	4	5	6	7	8	9	10	11
Past Positive (1)	-										
Past Negative (2)	-.39**	-									
Present Hedonistic (3)	.13**	.05	-								
Present Fatalistic (4)	-.07	.37**	.24**	-							
Future (5)	.01	.03	-.22**	-.15**	-						
Past Satisfaction with Life (6)	.58**	-.63**	.07	-.17**	-,03	-					
Present Satisfaction with Life (7)	.30**	-.52**	.12*	-.20**	-,02	.45**	-				
Future Satisfaction with Life (8)	.31**	-.36**	.17**	-.08	,05	.39**	.53**	-			
Positive Affect (9)	.23**	-.32**	.17**	-.30**	,19**	.24**	.53**	.40**	-		
Negative Affect (10)	-.29**	.58**	-.07	.27**	.04	-.43**	-.49**	-.39**	-.29**	-	
Psychological Well-Being (11)	.41**	-.58**	.14**	-.38**	.07	.49**	.59**	.47**	.53**	-.60**	-

Note: * *p*< .05, ** *p*< .01.

Figure 1

Figure 1. Structural equation model of time perspective and temporal life satisfaction (i.e., the Satisfaction Model).

Showing all inter-correlations for the five time perspective dimensions, all paths from the time perspective dimensions to the three temporal life satisfaction constructs, and their standardized parameter estimates. *Chi-square* = 3.96, *df*= 1, *p* =.047; *comparative fit index* = 1.00; *incremental fit index* = 1.00; *normed fit index* = 1.00; *root mean square error of approximation* = 0.08.
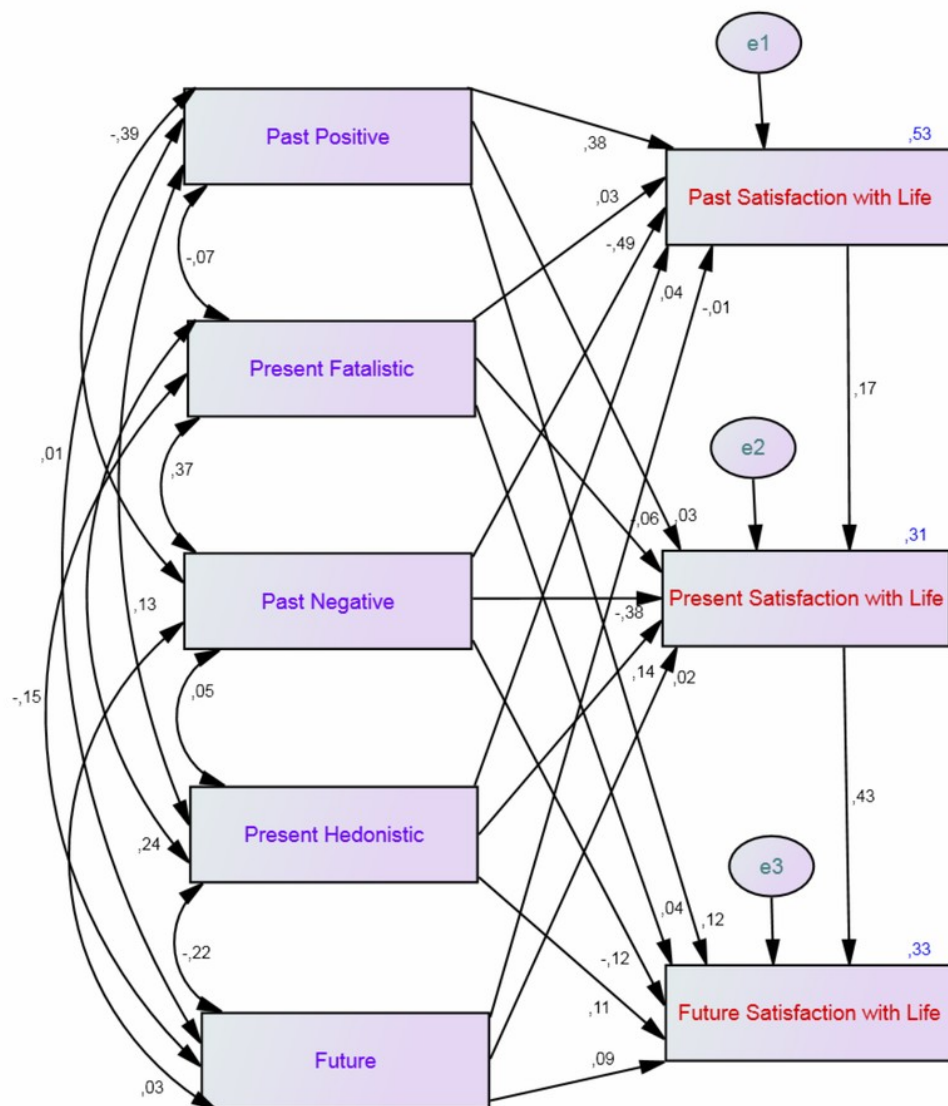
Figure 2

Figure 2. Structural equation model of time perspective, psychological well-being and affect (i.e., the PWB and PANA Model).

Showing all inter-correlations for the five time perspective dimensions, all paths from the time perspective dimensions to psychological well-being, positive affect, and negative affect, and their standardized parameter estimates. *Chi-square* =3.85, *df*= 1, *p* =.05; *comparative fit index* = 1.00; *incremental fit index* =1.00; *normed fit index* = 1.00; *root mean square error of approximation* = 0.08.
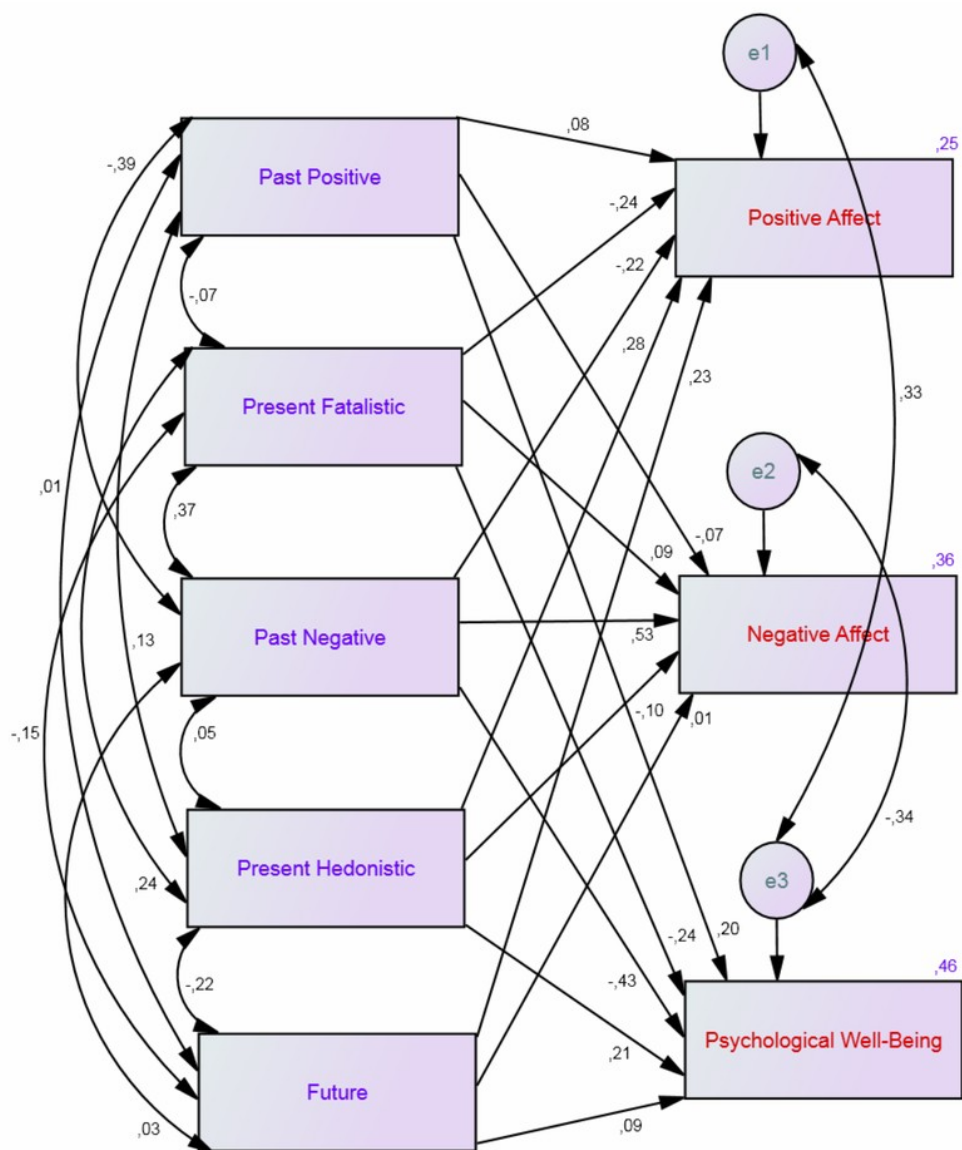
Figure 3

Figure 3. Summary of the results with regard to the relationships between the different time perspectives and temporal life satisfaction dimensions.
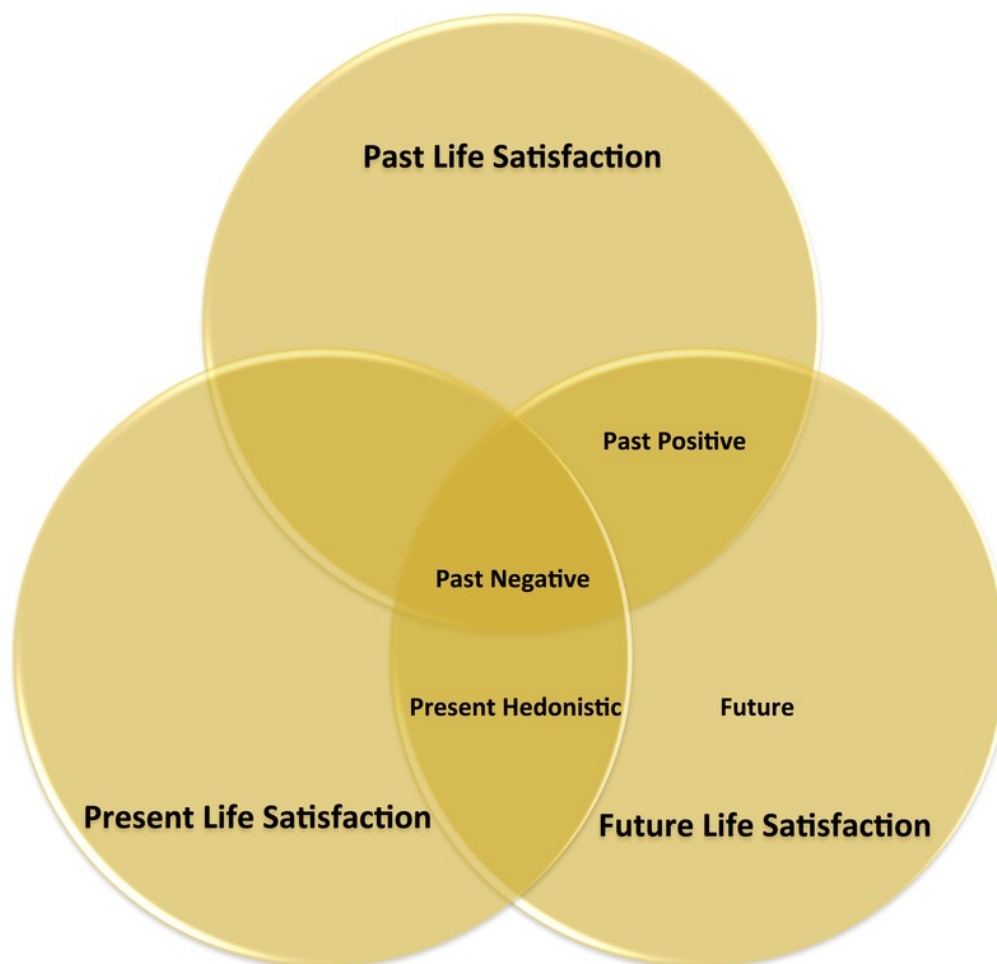
Table 2. Standardized and unstandardized coefficients for both models in the study.

Table 2. Standardized and unstandardized coefficients for both models in the study.

Time Perspective dimension	Well-Being Measure	R^2	β	B	SE	p
Satisfaction Model						
Past Positive			**.38**	**.82**	**.08**	**< .001**
Past Negative			**-.49**	**-.91**	**.07**	**< .001**
Present Hedonistic	Past Life Satisfaction	.53	.04	.11	.10	.28
Present Fatalistic			.03	.82	.10	.43
Future			-.01	-.03	.10	.78
Past Positive			.03	.06	.11	.56
Past Negative			**-.38**	**-.73**	**.10**	**< .001**
Present Hedonistic	Present Life Satisfaction	.31	**.14**	**.43**	**.13**	**< .001**
Present Fatalistic			-.06	-.17	.13	.19
Future			.02	.06	.12	.65
Past Positive			**.12**	**.22**	**.08**	**.005**
Past Negative			**-.12**	**-.18**	**.08**	**.02**
Present Hedonistic	Future Life Satisfaction	.33	**.11**	**.28**	**.10**	**.007**
Present Fatalistic			.04	.10	.03	.31
Future			**.09**	**.22**	**.10**	**.03**
PANA and PWB Model						
Past Positive			.08	.08	.04	.06
Past Negative			**-.22**	**-.17**	**.04**	**< .001**
Present Hedonistic	Positive Affect	.25	**.28**	**.36**	**.06**	**< .001**
Present Fatalistic			**-.24**	**-.30**	**.06**	**< .001**
Future			**.23**	**.29**	**.05**	**< .001**
Past Positive			-.07	-.06	.04	.11
Past Negative			**.53**	**.39**	**.03**	**< .001**
Present Hedonistic	Negative Affect	.36	**-.10**	**-.12**	**.05**	**.01**
Present Fatalistic			**.09**	**.10**	**.05**	**.03**
Future			.01	.02	.05	.73
Past Positive			**.20**	**.17**	**.03**	**< .001**
Past Negative			**-.43**	**-.31**	**.03**	**< .001**
Present Hedonistic	Psychological Well-Being	.46	**.21**	**.25**	**.04**	**< .001**
Present Fatalistic			**-.24**	**-.27**	**.04**	**< .001**
Future			**.09**	**.10**	**.04**	**.01**

Note: Significant relations in bold type.

Figure 4

Figure 4. Summary of the results with regard to the relationships between the different time perspectives, psychological well-being, and affect.