

Project on Future Time Perspective (SOEP-IS)

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“Knowing you don’t have much time left changes things.”
(Kami Garcia, 2011)

1 Introduction

The socioemotional selectivity theory (Carstensen, Isaacowitz, & Charles, 1999) assumes that time horizons play a major role in human motivational processes. More specifically, the theory suggests that our perception of time (i.e., Future Time Perspective; FTP) influences our preferences, goals, and cognitive processes, such as attention and memory (Carstensen, 2006). Carstensen et al. (1999) define two broad categories of goals whose priorities change depending on the subjective perception of time: (1) goals concerning the acquisition of knowledge and (2) goals concerning the regulation of emotion states. According to the authors, if time is perceived as limited, the latter category of goals predominates motivational processes. In doing so, people tend to focus on the regulation of emotional states in order to optimize their personal well-being. In contrast, if time is perceived as open-ended, preparatory goals emphasizing the acquisition of information and the experience of novelty are selected preferentially (see Table 1 for further information). Most importantly, the theory predicts that people experience motivational changes with chronological time (i.e., age). However, it is not age that causes the changes but changes in the perception of time (Fredrickson & Carstensen, 1990).

Since then, studies have examined the role of FTP in various contexts (see Kooij, Kanfer, Betts, & Rudolph, 2018, for review). Results from experimental studies suggest, for example, that the choice of social partners as well as the subjective priority of goals are both influenced by FTP (Fung & Carstensen, 2003; Fung, Carstensen, & Lutz, 1999; Lang & Carstensen, 2002). Furthermore, FTP has been found to be associated with differences in work-related behaviors, such as job performance and affective commitment (e.g., Bal, Jansen, van der Velde, de Lange, & Rousseau, 2010; Baltes, Wynne, Sirabian, Krenn, & de Lange, 2014; Treadway, Duke, Perrewé, Breland, & Goodman, 2011). Another group of variables frequently reported to be associated with FTP are health-related behaviors, such as physical activity and nutrition (e.g., Gellert, Ziegelmann, Lippke, & Schwarzer, 2012; Stahl & Patrick, 2012). For example, adults were more likely to engage in physical activity if they perceived their remaining lifetime as more expansive (Stahl & Patrick, 2012). A recent meta-analysis by Kooij and colleagues (2018) considered five types of outcomes (achievement, well-being, health behavior, risk taking, retirement planning) and three types of antecedents (sociodemographic factors, affective and personality traits, agentic traits related to the self) of FTP. Their analysis revealed, among others, positive associations between FTP (higher scores indicate a more open-ended perspective of time) and achievement, well-being, as well as health behavior. In contrast, risk taking-related behaviors and negative affectivity were negatively associated with FTP.

FTP has originally been operationalized as a bipolar construct, ranging from expansive (i.e., time is perceived as open-ended) to limited (Carstensen, 2006). Nowadays, there is increasing evidence indicating a two-dimensional structure of FTP, with one factor representing a focus on opportunities and the other factor representing a focus on limitations (e.g., Cate & John, 2007; Strough et al.,

	Open-ended FTP	Limited FTP
Focus	Long-term (preparatory) goals Gathering information Experiencing novelty Expansion of breadth of knowledge Social acceptance	Short-term goals Emotion regulation Generativity Optimization of psychological well-being Deepening of existing relationships
Time orientation	Future	Presence
Type of goals	Knowledge-related goals	Emotion-related goals

Table 1: Differences between open-ended and limited FTP.

2016). A commonly used scale to assess an individual’s FTP is the Future Time Perspective Scale developed by Lang and Carstensen (2002).

The present study aims at examining whether previous findings on FTP and its associations with socio-demographic, well-being-, health-, and personality-related variables can be observed in a representative sample of the German population. Furthermore, explorative factor analysis will be performed in order to examine whether FTP exhibits a one- or two-factor structure. If factor analysis suggests to extract to factors, statistical analyses will be performed separately for each factor.

2 Materials & Methods

2.1 Participants

Data from the Socio-economic Panel Innovation Sample (SOEP-IS) student version were used in the present study. In total, the data set included 31,060 rows (person-years) and 348 columns (variables/items). After selection of relevant variables and exclusion of missing values, the data set contained 724 participants and 40 variables (see 2.2 for further information). 403 (55.66%) participants were female and the mean age was 57 years with a standard deviation of 17 years (age range: 21 - 93 years). On average, participants had approximately 12 years of educational training ($SD = 2.5$ years; range: 7 - 18 years). In 2017, 251 (34.667%) participants worked full-time, 103 (14.23%) part-time, 13 (1.8%) were in vocational training, 40 (5.52%) were marginally employed, two (0.03%) were near retirement (zero working hours), and 314 (43.37%) participants were not employed. With respect to the marital status, 369 (50.97%) participants were married, 13 (1.8%) were married and separated, 176 (24.31%) were single, 105 (14.5%) were divorced, 60 (8.29%) were widowed, and one (0.01%) participant was in a registered same sex partnership. Figure 1 visualizes gender-specific distributions of marital status, employment status, amount of education, and age.

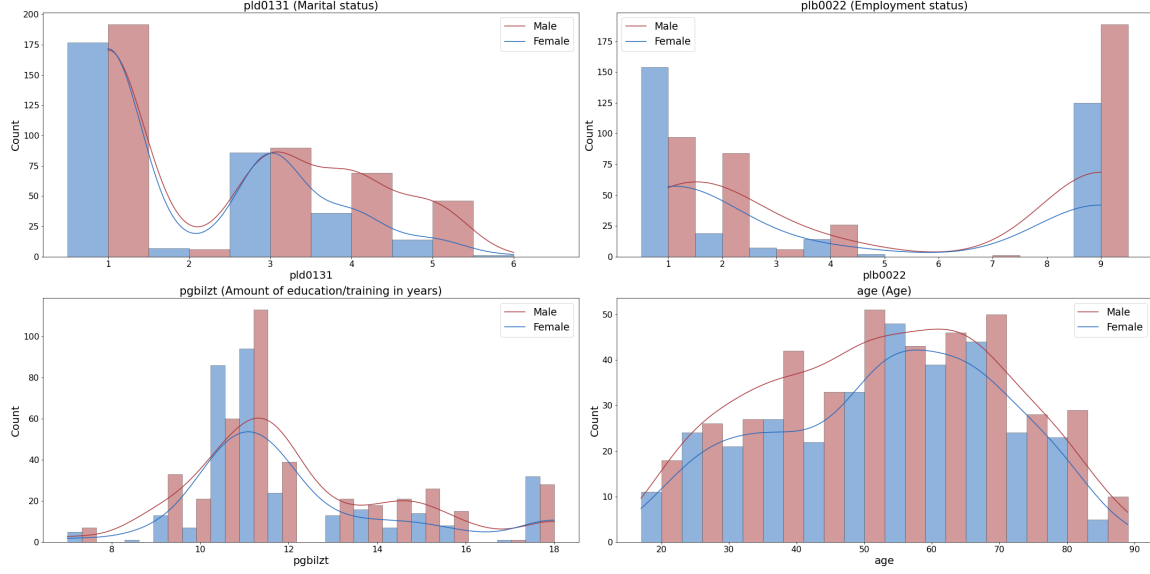


Figure 1: Gender-specific distributions of socio-demographic variables. Marital status: 1 = married, 2 = married, separated, 3 = single, 4 = divorced, 5 = widowed, 6 = registered same sex partnership, 7 = registered same sex partnership, separated. Employment status: 1 = full-time employment, 2 = regular part-time employment, 3 = vocational training, 4 = marginally employed, 5 = near retirement/zero working hours, 6 = military service, 7 = community service, 8 = sheltered workshop, 9 = not employed.

2.2 Variable selection

First, candidate correlates and antecedents of FTP were identified based on the meta-analysis by (Kooij et al., 2018). Table 2 provides an overview of the extracted variables and their previously reported associations with FTP. Second, the provided data were screened for identical or similar variables. In total, 91 items (including person ID, original household number, current wave household number, survey year, and the four items measuring FTP) were selected. Third, the amount of missing values was examined using the following approach. In the SOEP-IS, missing values are represented by negative numbers (i.e., -1: no answer, -2: does not apply, -3: answer improbable, -5: not included). Hence, negative numbers were recoded as “Not a Number” (NaN). In a first step, rows having missing values on the subset of the four FTP items were dropped. Since FTP has only been measured in 2017, only 902 out of 31,060 rows were kept after the removal of missing values on FTP items. In a second step, each column (i.e., variable/item) was examined for its amount of non-missing values. Columns containing more than 90% non-missing values were kept in the data set. In the end, 36 columns did not fulfill this criterion and were thus removed from the data set. Out of the remaining 55 items (724 rows), 36 items (plus the four FTP items) were selected for the final data set based on their meaning/content (see Table 3 for further information). Note that the variable “age” was manually added to the data set by subtracting the year of birth from 2017 (survey year).

Variable	Findings of previous studies
Socio-demographic variables	
Age	Inverted U-shaped relationship with FTP
Gender	Women: stronger focus on future opportunities compared to men, Men: stronger focus on limited time compared to women
Socioeconomic status	Positive relationship with FTP
Well-being	
Life satisfaction	Positive relationship with FTP
Subjective health	Positive relationship with (open-ended) FTP
Anxiety	Negative relationship with FTP
Depression	Negative relationship with FTP
Health behavior	
Substance use	Negative relationship with FTP
Physical exercise	Positive relationship with FTP
Eating behavior	Positive relationship between fruit and vegetable intake & FTP ¹ Positive relationship between consideration of future consequences and organic food consumption ²
Personality traits	
Positive affect	Positive relationship with FTP
Negative affect	Negative relationship with FTP
Big 5	Openness, agreeableness, extraversion, and conscientiousness: Positive relationship with FTP, Neuroticism: Negative relationship with FTP
Hope	Positive relationship with
Optimism	Positive relationship with FTP
Agentic traits	
Locus of control	Positive relationship with FTP
Self-efficacy	Positive relationship with FTP
Self-esteem	Positive relationship with FTP

Table 2: Socio-demographic, well-being-, health-, and personality-related variables and their relationships with FTP based on Kooij et al. (2018). ¹ Gellert et al. (2012). ² Bénard et al. (2018).

Variable name	Description
pid	Person ID
syear	Survey year
Socio-demographic variables	
sex	Gender
age	Age (2017 - gebyear)
pld0131	Marital status
plb0022	Employment status
pgbilzt	Amount of education or training (in years)
Well-being	
plh0171	Satisfaction with health
plh0172	Satisfaction with sleep
plh0182	Current life satisfaction
Health behavior	
ple0008	Current health
ple0026	Pressed for time last four weeks
ple0027	Run-down, melancholy last four weeks
ple0028	Well-balanced last four weeks
ple0029	Used energy last four weeks
ple0030	Strong physical pain last four weeks
ple0031	Limitations due to physical problems
ple0035	Limited socially due to health
ple0053	Hospital stays previous year
pli0059	Hours of sleep, normal workday
Personality traits	
plh0212	Thorough worker
plh0213	Am communicative
plh0214	Am sometimes too coarse with others
plh0215	Am original
plh0216	Worry a lot
plh0217	Able to forgive
plh0218	Tend to be lazy
plh0219	Am sociable
plh0220	Value artistic experiences
plh0221	Somewhat nervous
plh0222	Carry out tasks efficiently
plh0223	Reserved
plh0224	Friendly with others
plh0225	Have lively imagination
plh0226	Deal well with stress
plh0255	Inquisitive

Table 3: Overview of independent variables used in the present study.

2.2.1 Dependent variable

FTP was measured using the following four items of the Future Time Perspective Scale (items 1, 3, 8 and 10) developed by Lang and Carstensen (2002):

1. Many opportunities await me in the future.
2. My future is filled with possibilities.
3. I have the sense that time is running out.
4. As I get older, I begin to experience that time is limited.

Items were rated on a scale from 1 (very good) to 5 (not at all) in order to assess the degree of agreement. Since item responses were only collected in 2017, 30,142 out of 31,060 values were coded with -5 meaning that the items were not included. 16 further values were coded with -1 meaning that no answer was provided. Out of the 902 not-null values, 724 were used for further analysis.

2.3 Statistical analysis

Statistical analyses were run in Python 3.7.10. To examine the relationships between the socio-demographic, well-being, health-, personality-related variables and FTP, multiple linear regression models were computed with FTP as dependent variable. Independent variables were added in a stepwise manner in order to examine their explanatory utility. First, socio-demographic variables were included as independent variables (“base model”). Second, well-being-related variables were added. Third, health-related variables were included. Lastly, personality-related variables were added. Nested models were compared using F tests. If the model comparison indicated that the more parsimonious model should be preferred, only statistically significant independent variables of the less parsimonious model were kept in the model equation. If the model comparison indicated that the less parsimonious model does not fit the data worse than the more parsimonious model, the next model was compared to this less parsimonious model. All analyses were carried out at a significance level of $\alpha = .05$. Continuous independent variables were standardized using sklearn’s StandardScaler. Categorical independent variables were dummy-coded. Regression analyses were performed using the Python module statsmodels.

3 Results

3.1 Descriptive statistics

Table 4 provides descriptive statistics for each independent variable included in the present study (mean, standard deviation, minimum value, maximum value, median). Note that gender, marital status, and employment status were not included in Table 4 as they represent categorical variables.

Variable label	Mean	Std	Min	Max	Median
Age	53.00	17.22	17.0	89.0	54.0
Amount of education	12.21	2.48	7.0	18.0	11.5
Satisfaction with health	6.63	2.19	0.0	10.0	7.0
Satisfaction with sleep	6.73	2.25	0.0	10.0	7.0
Current life satisfaction	7.64	1.55	0.0	10.0	8.0
Thorough worker	6.12	1.00	1.0	7.0	6.0
Am communicative	5.53	1.36	2.0	7.0	6.0
Am sometimes too coarse with others	3.16	1.76	1.0	7.0	3.0
Am original	4.73	1.39	1.0	7.0	5.0
Worry a lot	4.40	1.81	1.0	7.0	5.0
Able to forgive	5.48	1.39	1.0	7.0	6.0
Tend to be lazy	2.63	1.68	1.0	7.0	2.0
Am sociable	5.12	1.45	1.0	7.0	5.0
Value artistic experiences	4.48	1.82	1.0	7.0	5.0
Somewhat nervous	3.74	1.67	1.0	7.0	4.0
Carry out tasks efficiently	5.72	1.05	1.0	7.0	6.0
Reserved	4.12	1.58	1.0	7.0	4.0
Friendly with others	5.84	1.01	1.0	7.0	6.0
Have lively imagination	5.00	1.51	1.0	7.0	5.0
Deal well with stress	4.55	1.48	1.0	7.0	5.0
Inquisitive	5.66	1.24	1.0	7.0	6.0
Current health	2.64	0.93	1.0	5.0	3.0
Pressed for time last four weeks	3.31	1.04	1.0	5.0	3.0
Run-down, melancholy last four weeks	3.72	0.97	1.0	5.0	4.0
Well-balanced last four weeks	2.58	0.84	1.0	5.0	2.0
Used energy last four weeks	2.91	0.89	1.0	5.0	3.0
Strong physical pain last four weeks	3.86	1.14	1.0	5.0	4.0
Limitations due to physical problems	3.88	1.17	1.0	5.0	4.0
Limited socially due to health	4.44	0.91	1.0	5.0	5.0
Hospital stays previous year	1.85	0.36	1.0	2.0	2.0
Hours of sleep, workday	6.74	1.18	3.0	12.0	7.0
FTP: Many opportunities in future	3.27	1.21	1.0	5.0	3.0
FTP: Future is filled with possibilities	3.42	1.18	1.0	5.0	3.0
FTP: Time is running out	1.99	1.22	1.0	5.0	1.0
FTP: Time is limited	2.87	1.40	1.0	5.0	3.0

Table 4: Descriptive statistics for all items included in the present study. Std: standard deviation, Min: minimum value, Max: Maximum value.

3.1.1 FTP

Pearson product-moment correlations revealed that the first two FTP items (zp1, zp2) were strongly correlated ($r = .85$). Similarly, the last two items (zp3, zp4) were found to be highly correlated ($r = .56$). All other correlation coefficients were negative and of moderate size ranging from $-.29$ ($r_{zp1, zp4}$) to $-.38$ ($r_{zp2, zp3}$). Computation of item difficulties showed that items zp1 (.82), zp2 (.85), and zp4 (.72) were rather easy meaning that most participants answered the items in the direction of the attribute. For item zp3, the item difficulty was lower with a value of .5 meaning that comparatively less participants answered the item in the direction of the attribute. Item variances

took on similar values ranging from 1.39 for item zp2 to 1.95 for item zp4. For items zp1 and zp2, negative skewness values (zp1: -0.24 , zp2: -0.33) indicated left-skewed distributions (i.e., the left tail is longer). For item zp3, a positive skewness value of 0.92 indicated a right-skewed distribution. The skewness value of zp4 was close to zero (-0.02) indicating a symmetric distribution. All four FTP items showed negative kurtosis values (ranging from -0.38 (zp3) to -1.28 (zp4)) meaning that their distribution curves were flatter than a normal distribution curve with the same mean and standard deviation, respectively. Figure 2 visualizes the distributions of all four FTP items. With respect to item selectivity, computation of part-whole-corrections revealed values close to zero (zp1: $.08$, zp2: $.07$, zp3: $-.04$, zp4: $< -.001$). Accordingly, each item seemed to have little in common with all other items of the FTP scale. One explanation for this finding might be a potential two-factor structure of the scale. In this case, the scale would measure two different aspects of FTP.

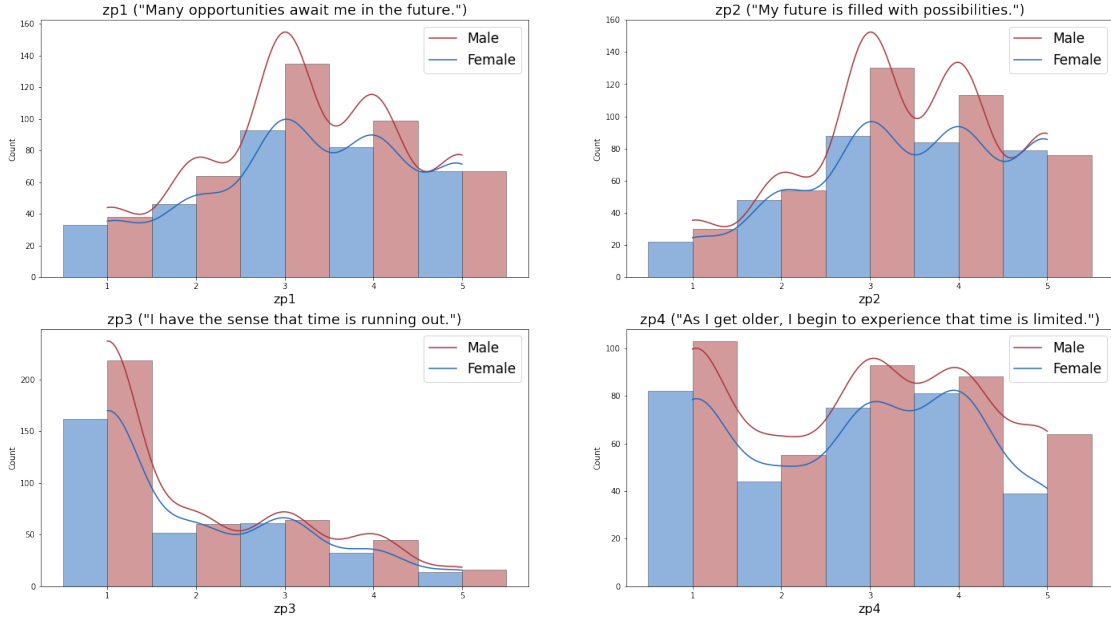


Figure 2: Gender-specific distributions of FTP items (zp1, zp2, zp3, zp4) for the final sample used in the study. Note that items are rated on a scale from 1 (very good) to 5 (not at all).

3.1.2 Correlation analysis

Correlation analyses between groups of the independent variables and the dependent variable were conducted. With respect to the first two FTP items (zp1, zp2), small positive correlations with items measuring facets of well-being (satisfaction with health, sleep, and current satisfaction; Pearson's correlation coefficients between $r = .15$ and $r = .27$), health (limited socially due to health, limitations due to physical problems, hospital stays previous year, strong physical pain last for weeks, and run-down melancholy last four weeks; r between $.11$ and $.24$), and personality traits (am communicative, am original, am sociable, have lively imagination, deal well with stress, and inquisitive; r between $.1$ and $.24$) were observed. In addition, small negative correlations with health (pressed for time last four weeks and used energy last four weeks; r between $-.23$ and $-.12$), and the personality trait item "reserved" ($r = -.15$, $r = -.17$, respectively) as well as medium negative correlations with current health ($r = -.3$), and age ($r = -.45$, $r = -.44$, respectively) were found.

With respect to the second two FTP items (zp3, zp4), small negative correlations with the well-being items (r between $-.26$ and $-.10$), measures of health (limited socially due to health, limitations due to physical problems, strong physical pain last for weeks, and run-down melancholy last four

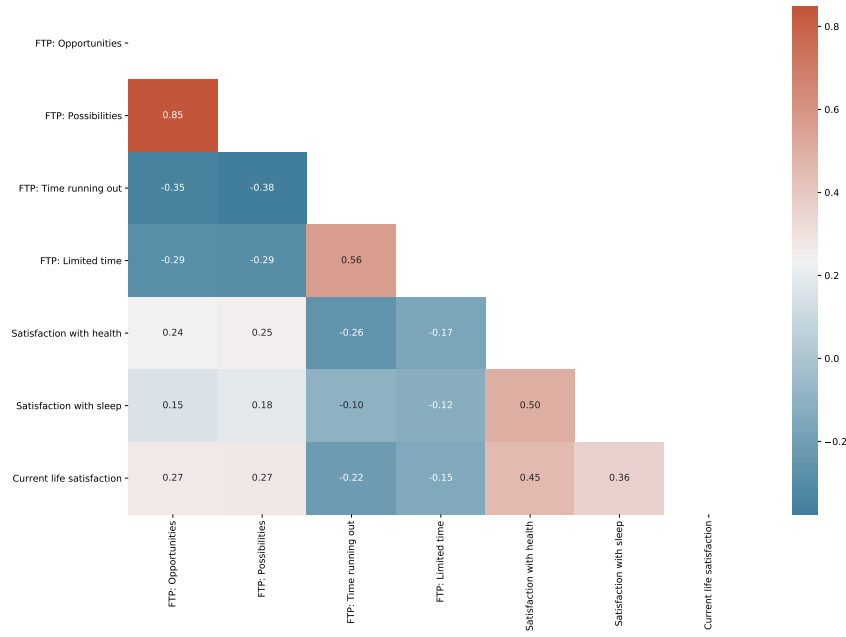


Figure 3: Correlation heatmap including the four FTP items (zp1-zp4) and all well-being items. Values quantify Pearson's correlation coefficients.

weeks ; r between $-.21$ and $-.11$), a positive correlation with current health ($r = .30, r = .21$, respectively), and a medium positive correlation with age ($r = .35, r = .31$, respectively) were observed. All reported results are shown in Figure 3, Figure 4, Figure 5, and Figure 6, respectively.

Among the independent variables, the following items were found to be highly correlated: satisfaction with health and satisfaction with sleep ($r = .5$), satisfaction with health and strong physical pain last four weeks ($r = .5$), satisfaction with health and limitations due to physical problems ($r = .51$), limitations due to physical problems and limited socially due to health ($r = .5$), limitations due to physical problems and strong physical pain last four weeks ($r = .6$), and am communicative and am sociable ($r = .58$). Furthermore, correlations between current health and each of the following variables were found to be strongly negative (cf. Figure 7): strong physical pain last four weeks ($r = -.53$), limitations due to physical problems ($r = -.58$), and satisfaction with health ($r = -.75$). In addition, a strongly negative correlation between run-down, melancholy last four weeks and well-balanced last four weeks was observed ($r = -.5$).

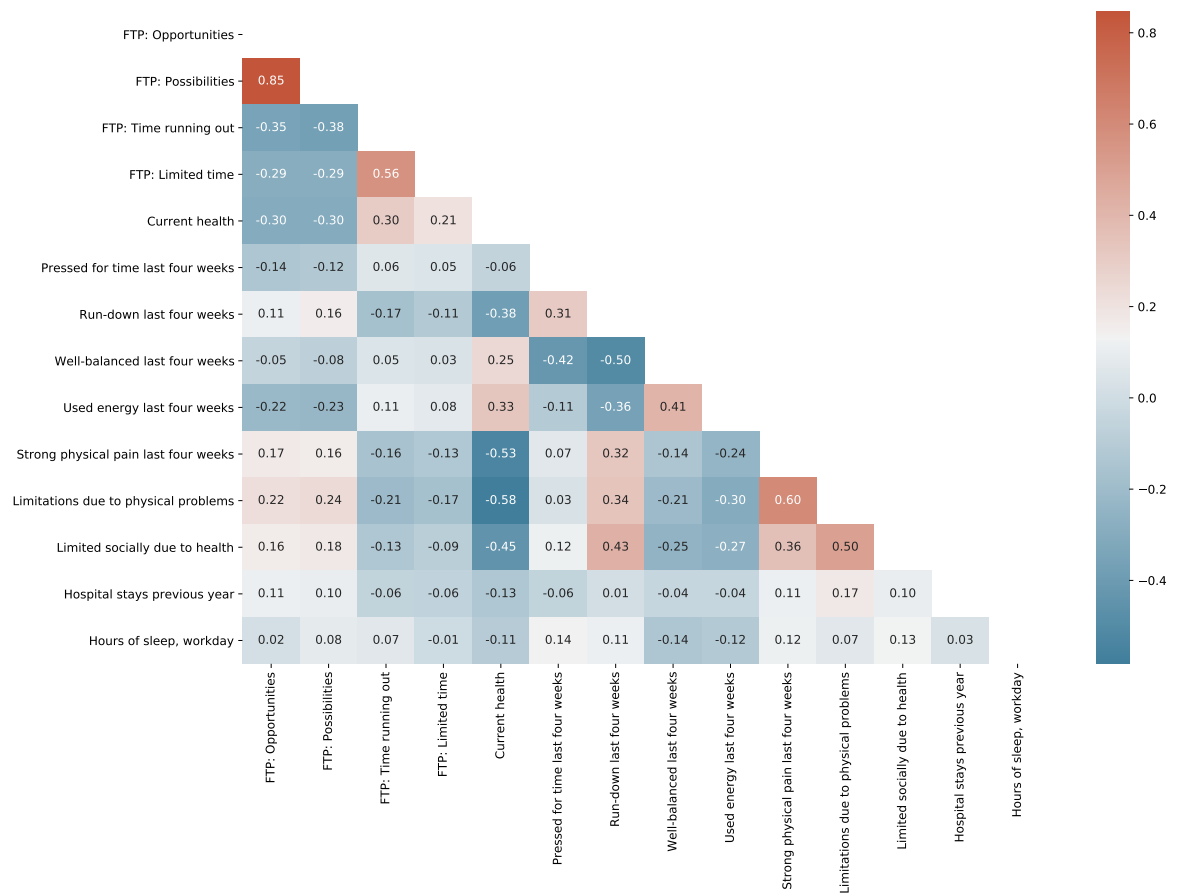


Figure 4: Correlation heatmap including the four FTP items (zp1-zp4) and all health-related items. Values quantify Pearson's correlation coefficients.

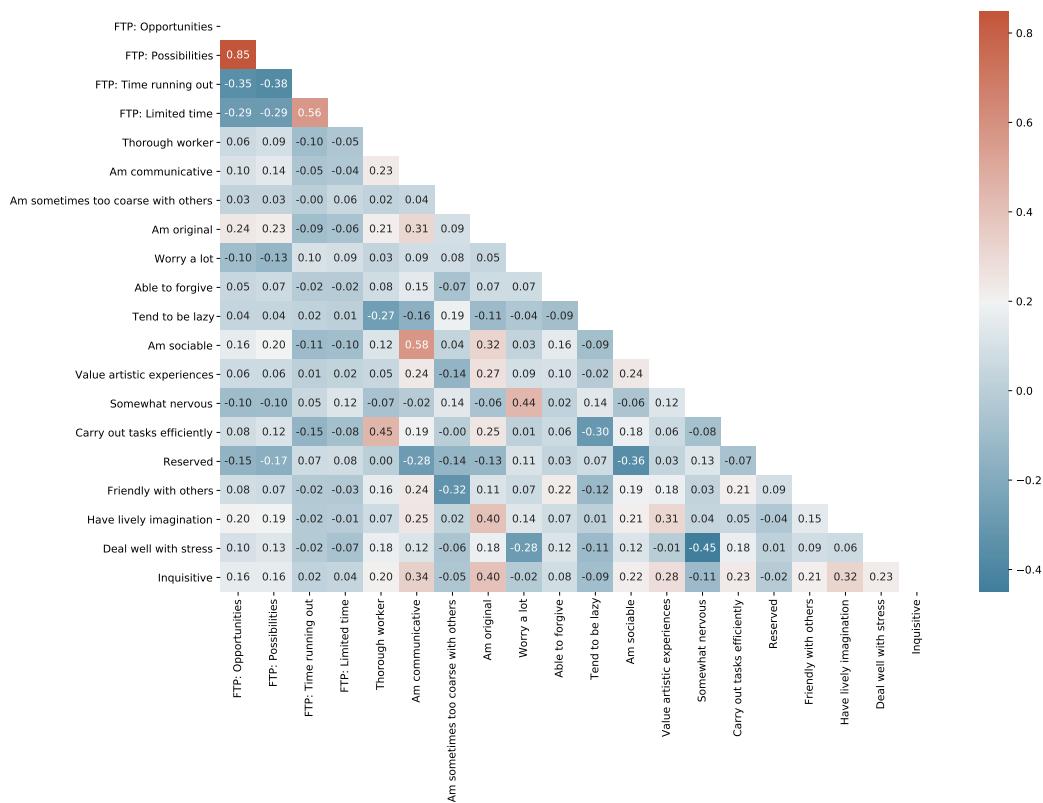


Figure 5: Correlation heatmap including the four FTP items (zp1-zp4) and all personality-related items. Values quantify Pearson's correlation coefficients.

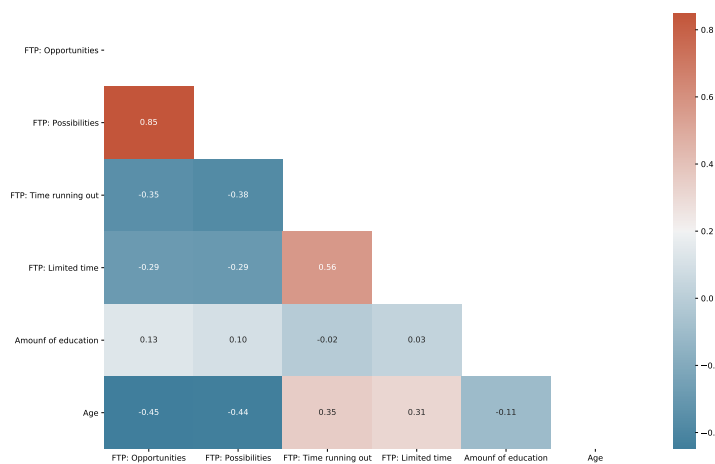


Figure 6: Correlation heatmap including the four FTP items (zp1-zp4), age, and years of education (pgbilzt). Values quantify Pearson's correlation coefficients.

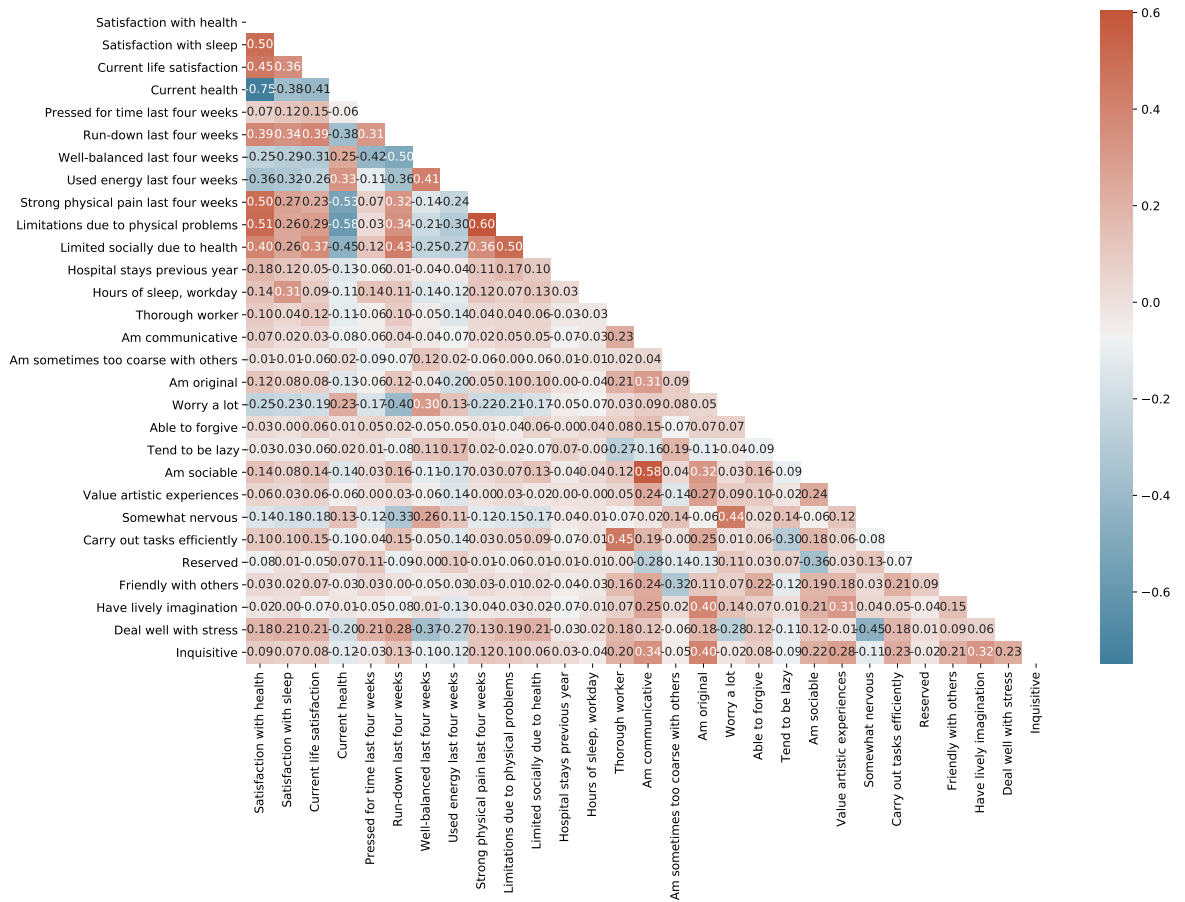


Figure 7: Correlation heatmap including all independent variables (besides socio-demographic variables). Values quantify Pearson’s correlation coefficients.

3.2 Exploratory factor analysis

The Python module “factor_analyzer” (FactorAnalyzer class with default settings) was used to perform explorative factor analysis. Figure 8 shows the resulting scree plot. Based on the Kaiser criterion, two factors should be extracted (eigenvalues > 1). Eigenvalues larger than 1 indicate that a factor explains more than a single item. The first factor (“focus on opportunities”) loaded on the first two items (zp1, zp2) with loadings of .84 and .97, respectively, whereas the second factor (“focus on limitations”) was associated with the last two items (zp3, zp4) with loadings of .75 and .7, respectively (using varimax rotation to ease interpretation). Cronbach’s α took on values of .92 and .72 for factor 1 and factor 2, respectively (computed by using the module “pengouin”). In accordance with the results, two composite scales representing the two aforementioned factors were constructed. All further analyses were performed using each composite scale as dependent variable, respectively.

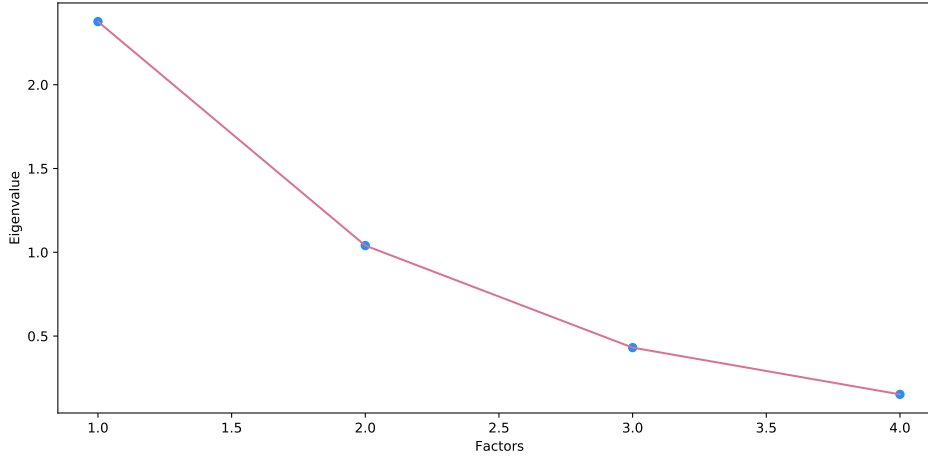


Figure 8: Scree plot illustrating the results of explorative factor analysis.

3.3 Multiple linear regression models

Before entering the regression model, the following categorical variables were transformed in order to ease interpretation of results. Marital status (pld0131) was forced to have two levels: in a relationship (1) versus not in a relationship (0). Married and registered same sex partnership were considered as in a relationship. All other levels were coded with 0. In a similar manner, levels of employment status (plb0022) were aggregated into two levels: working at the time of the survey (1) versus not working at the time of the survey (0). The latter level included the original levels “near retirement” and “not employed”. All other levels were coded with 1. Amount of education (pgbilzt) was transformed into three levels measuring whether the number of education years is below average (0), average (1) or above average (2). Below and above average are defined as less or more than one standard deviation below or above the average amount of education (in years).

With respect to the personality items (plh012-plh0226), composite scales for the Big 5 personality traits (conscientiousness, extraversion, agreeableness, openness, neuroticism) were constructed (three items per personality trait). If necessary, items were recoded in the direction of the personality trait (plh0218, plh0223, plh0214, plh0226).

3.3.1 Factor of focus on opportunities

The base model included age as a standardized continuous variable as well as sex, marital status, employment status and amount of education as categorical variables. Results indicated that the independent variables accounted for 23% of the variance in the FTP factor “focus on opportunities” (adjusted $R^2 = 0.22$, $F = 35.67$, $p < .001$). A person of average age, male gender, not in a relationship, not working at the time of the survey, and with an amount of education that is below average was expected to have a value of 3.29 on the dependent variable ($t = 22.22$, $p < .001$). Female gender compared to male gender was expected to decrease the dependent variable by 0.1 units ($t = -1.29$, $p = .2$). Being in a relationship compared to being not in a relationship was expected to increase the dependent variable by 0.1 units ($t = 1.33$, $p = .19$). Being employed compared to being not employed was expected to significantly increase the dependent variable by 0.2 units ($t = 2.15$, $p = .03$). Compared to below-average amount of education, average amount of education was expected to decrease the dependent variable by 0.11 units ($t = -0.745$, $p = .46$). In contrast, above-average amount of education was expected to increase the dependent variable by 0.12 units ($t = 0.76$, $p = .45$). For age, a statistically significant negative regression coefficient

indicated that a change in age by one standard deviation is associated with a change in the dependent variable by -0.49 units ($t = -10.65, p < .001$). Hence, the results suggest that the value of focus on opportunities decreases with increasing age. Based on statistical significance, age and employment status were kept as independent variables

Adding the three well-being-related variables increased the amount of explained variance by 9% (adjusted $R^2 = 0.31, F = 37.16, p < .001$). A change in current life satisfaction (plh0182) by one standard deviation was associated with a change in the dependent variable by 0.29 units ($t = 7.05, p < .001$). Effects of satisfaction with health ($b = 0.05, t = 1.05, p = .29$) and sleep ($b = 0.07, t = 1.72, p = .09$) were not statistically significant. Comparing the model to the base model, the F test indicated that the base model should be preferred ($F = 31.14, p < .001$). Thus, only current life satisfaction was kept in the model equation.

By adding the ten health-related variables to the regression model, 35% of the variance in the dependent variable could be explained (adjusted $R^2 = 0.31, F = 37.16, p < .001$). Only the item ple0029 (used energy last 4 weeks) showed a statistically significant effect on the dependent variable ($t = -4.22, p < .001$), indicating that a change in the item by one standard deviation is associated with a change in the dependent variable by -0.17 units (Table 5).

	β	SE	t	p	Lower 95% CI	Upper 95% CI
Intercept	3.34	0.14	23.78	<.001	3.06	3.61
Sex (Female)	-0.07	0.07	-0.97	.33	-0.21	0.07
Relationship (Yes)	0.04	0.07	0.47	.64	-0.11	0.18
Employed (Yes)	0.16	0.09	1.79	.07	-0.01	0.33
Education (Average)	-0.08	0.13	-0.60	.55	-0.34	0.18
Education (Above Average)	-0.02	0.15	-0.12	.91	-0.32	0.28
Age	-0.49	0.04	-10.84	<.001	-0.58	-0.40
Current life satisfaction	0.25	0.04	6.08	<.001	0.17	0.33
Current health	-0.07	0.05	-1.39	.16	-0.16	0.03
Pressed for time last four weeks	-0.06	0.04	-1.33	.18	-0.14	0.03
Run-down, melancholy last four weeks	0.06	0.05	1.24	.22	-0.03	0.15
Well-balanced last four weeks	0.01	0.04	0.16	.87	-0.08	0.1
Used energy last four weeks	-0.17	0.04	-4.22	<.001	-0.25	-0.09
Strong physical pain last four weeks	-0.03	0.05	-0.71	.48	-0.12	0.06
Limitations due to physical problems	-0.02	0.05	-0.45	.65	-0.12	0.08
Limited socially due to health	0.03	0.04	0.69	.49	-0.06	0.12
Hospital stays previous year	0.05	0.04	1.4	.16	-0.02	0.12
Hours of sleep, workday	0.06	0.04	1.69	.09	-0.01	0.13

Table 5: Multiple linear regression model including all health-related variables (in addition to significant well-being-related variables as well as all socio-demographic variables). The dependent variable is the first FTP factor: focus on opportunities.

Comparing the model to the model including socio-demographic variables and current life satisfaction, the F test indicated that the latter model should be preferred ($F = 4.13, p < .001$). Thus, only ple0029 was kept in the model equation.

Lastly, six personality-related variables were added. The model indicated that 39% of the variance in the dependent variable could be explained (adjusted $R^2 = 0.38, F = 32.38, p < .001$). Three independent variables showed a statistically significant effect on the dependent variable: extraversion, openness, and the item plh0255 (inquisitive). A one-standard deviation change in extraversion was associated with a change in the dependent variable by 0.09 units ($t = 2.32, p = .02$). For openness

($t = 3.44, p = .001$) and inquisitive ($t = 2.66, p = .01$), the change in the dependent variable was expected to be 0.14 and 0.1 units, respectively (Table 6). Comparing the model to the model including socio-demographic variables, current life satisfaction, and ple0029, the F test indicated that the latter model should be preferred ($F = 9.75, p < .001$). Thus, only extraversion, openness, and plh0255 were kept in the model equation. The results of the final regression model are shown in Table 7.

	β	SE	t	p	Lower 95% CI	Upper 95% CI
Intercept	3.44	0.14	25.49	<.001	3.17	3.7
Sex (Female)	-0.11	0.07	-1.52	.13	-0.26	0.03
Relationship (Yes)	0.09	0.07	1.27	.20	-0.05	0.23
Employed (Yes)	0.20	0.08	2.41	.02	0.04	0.36
Education (Average)	-0.22	0.13	-1.72	.09	-0.47	0.03
Education (Above Average)	-0.16	0.15	-1.06	.29	-0.45	0.13
Age	-0.51	0.04	-11.99	<.001	-0.59	-0.42
Current life satisfaction	0.26	0.04	7.26	<.001	0.19	0.33
Used energy last four weeks	-0.13	0.04	-3.62	<.001	-0.20	-0.06
Extraversion	0.09	0.04	2.32	.02	0.01	0.16
Neuroticism	-0.07	0.04	-1.74	.08	-0.14	0.01
Openness	0.14	0.04	3.44	.001	0.06	0.22
Agreeableness	0.05	0.04	1.34	.18	-0.02	0.12
Conscientiousness	-0.01	0.04	-0.39	.70	-0.09	0.06
Inquisitive	0.10	0.04	2.66	.01	0.03	0.18

Table 6: Multiple linear regression model including all personality-related variables (in addition to significant well-being- and health-related variables as well as all socio-demographic variables). The dependent variable is the first FTP factor: focus on opportunities.

	β	SE	t	p	Lower 95% CI	Upper 95% CI
Intercept	3.44	0.13	25.61	<.001	3.18	3.71
Sex (Female)	-0.13	0.07	-1.84	.07	-0.27	0.01
Relationship (Yes)	0.08	0.07	1.10	.27	-0.06	0.22
Employed (Yes)	0.20	0.08	2.48	.01	0.04	0.37
Education (Average)	-0.21	0.13	-1.65	.10	-0.46	0.04
Education (Above Average)	-0.14	0.15	-0.94	.35	-0.43	0.15
Age	-0.5	0.04	-11.93	<.001	-0.58	-0.42
Current life satisfaction	0.28	0.04	7.84	<.001	0.21	0.35
Used energy last four weeks	-0.14	0.04	-3.94	<.001	-0.21	-0.07
Extraversion	0.09	0.04	2.42	.02	0.02	0.16
Openness	0.13	0.04	3.32	<.01	0.05	0.21
Inquisitive	0.12	0.04	3.03	<.01	0.04	0.19

Table 7: Final multiple linear regression model for the first FTP factor (focus of opportunities).

3.3.2 Factor of focus on limitations

The same base model as for the first FTP factor was applied to the second FTP factor. Results indicated that the independent variables accounted for 14% of the variance in the FTP factor “focus

on limitations" (adjusted $R^2 = 0.14$, $F = 20.15$, $p < .001$). A person of average age, male gender, not in a relationship, not working at the time of the survey, and with an amount of education that is below average was expected to have a value of 2.35 on the dependent variable ($t = 14.86$, $p < .001$). Female gender compared to male gender was expected to increase the dependent variable by 0.01 units ($t = 0.1$, $p = .92$). Being in a relationship compared to being not in a relationship was expected to decrease the dependent variable by 0.06 units ($t = -0.7$, $p = .49$). Being employed compared to being not employed was expected to decrease the dependent variable by 0.08 units ($t = -0.79$, $p = .43$). Compared to below-average amount of education, average amount of education was expected to increase the dependent variable by 0.15 units ($t = 0.97$, $p = .33$). Similarly, above-average amount of education was expected to increase the dependent variable by 0.24 units ($t = 1.38$, $p = .17$). For age, a statistically significant positive regression coefficient indicated that a change in age by one standard deviation is associated with a change in the dependent variable by 0.42 units ($t = 8.6$, $p < .001$). Hence, the results suggest that the value of focus on limitations increases with increasing age.

Adding the three well-being-related variables increased the amount of explained variance by 6% (adjusted $R^2 = 0.20$, $F = 20.63$, $p < .001$). A change in satisfaction with health (plh0171) by one standard deviation was associated with a change in the dependent variable by -0.14 units ($t = -2.8$, $p < .01$), a change in current life satisfaction (plh0182) by one standard deviation was associated with a change in the dependent variable by -0.2 units ($t = -4.32$, $p < .001$). Effect of satisfaction with sleep ($b = -0.02$, $t = -0.53$, $p = .6$) was not statistically significant. Comparing the model to the base model, the F test indicated that the base model should be preferred ($F = 18.62$, $p < .001$). Thus, satisfaction with health and current life satisfaction were kept in the model equation.

By adding the ten health-related variables to the regression model, 23% of the variance in the dependent variable could be explained (adjusted $R^2 = 0.21$, $F = 11.42$, $p < .001$). Only the items ple0008 (current health) and ple0027 (run-down, melancholy last four weeks) showed a statistically significant effect on the dependent variable ($b = 0.13$, $t = 2.05$, $p = .04$), and ($b = -0.15$, $t = -2.95$, $p = .01$), respectively. Comparing the model to the model including socio-demographic variables, satisfaction with health, and satisfaction with current life satisfaction, the F test indicated that at a significance level of $\alpha = .05$, the model does not fit the data worse than the more parsimonious model ($F(715, 705) = 1.8$, $p = .06$). Thus all health-related variables were kept in the model equation (Table 8).

	β	SE	t	p	Lower 95% CI	Upper 95% CI
Intercept	2.30	0.15	14.83	<.001	2.00	2.60
Sex (Female)	-0.02	0.08	-0.2	.82	-0.17	0.14
Relationship (Yes)	-0.025	0.08	-0.30	.76	-0.19	0.14
Employed (Yes)	-0.02	0.10	-0.16	.88	-0.21	0.17
Education (Average)	0.13	0.15	0.89	.37	-0.16	0.42
Education (Above Average)	0.36	0.17	2.11	.04	0.03	0.69
Age	0.42	0.05	8.49	<.001	0.33	0.52
Satisfaction with health	-0.02	0.06	-0.35	.73	-0.14	0.10
Current life satisfaction	-0.15	0.05	-3.34	.001	-0.24	-0.06
Current health	0.13	0.07	2.05	.04	0.01	0.26
Pressed for time last four weeks	-0.01	0.05	-0.15	.89	-0.10	0.08
Run-down, melancholy last four weeks	-0.15	0.05	-2.95	<.01	-0.25	-0.05
Well-balanced last four weeks	-0.02	0.05	-0.31	.76	-0.11	0.08
Used energy last four weeks	0.01	0.05	0.13	.90	-0.08	0.09
Strong physical pain last four weeks	0.01	0.05	0.27	.78	-0.09	0.12
Limitations due to physical problems	-0.01	0.06	-0.24	.81	-0.12	0.10
Limited socially due to health	0.02	0.05	0.49	.62	-0.07	0.12
Hospital stays previous year	-0.02	0.04	-0.53	.59	-0.10	0.06
Hours of sleep, workday	0.04	0.04	0.96	.34	-0.04	0.12

Table 8: Multiple linear regression model including all health-related variables (in addition to significant well-being-related variables as well as all socio-demographic variables). The dependent variable is the second FTP factor: focus on limitations.

Adding the six personality-related variables, the model indicated that 24% of the variance in the dependent variable could be explained (adjusted $R^2 = 0.22$, $F = 9.31$, $p < .001$). Two independent variables showed a statistically significant effect on the dependent variable: conscientiousness and plh0255 (inquisitive). A one-standard deviation change in conscientiousness was associated with a change in the dependent variable by -0.11 units ($t = -2.53$, $p = .01$). For plh0255, the change in the dependent variable was expected to be 0.1 units ($t = 2.14$, $p = .03$). Please refer to Table 9 for further information. Comparing the model to the model including socio-demographic variables, satisfaction with health, current life satisfaction, and all health-related variables, the F test indicated that the latter model should be preferred ($F = 2.52$, $p = .02$). Thus, only conscientiousness and plh0255 were kept in the model equation. The results of the final regression model are shown in Table 10.

	β	SE	t	p	Lower 95% CI	Upper 95% CI
Intercept	2.25	0.16	14.4	<.001	1.94	2.55
Sex (Female)	0.02	0.08	0.27	.79	-0.14	0.19
Relationship (Yes)	-0.03	0.08	-0.38	.70	-0.19	0.13
Employed (Yes)	<-0.01	0.10	-0.03	.98	-0.19	0.19
Education (Average)	0.17	0.15	1.13	.26	-0.12	0.46
Education (Above Average)	0.35	0.17	2.06	.04	0.02	0.69
Age	0.43	0.05	8.54	<.001	0.33	0.53
Satisfaction with health	-0.01	0.06	-0.22	.83	-0.14	0.11
Current life satisfaction	-0.14	0.05	-3.09	<.01	-0.23	-0.05
Current health	0.13	0.06	2.01	.05	<0.01	0.26
Pressed for time last four weeks	-0.01	0.05	-0.25	.80	-0.10	0.08
Run-down, melancholy last four weeks	-0.14	0.05	-2.60	.01	-0.24	-0.03
Well-balanced last four weeks	-0.03	0.05	-0.52	.60	-0.13	0.08
Used energy last four weeks	-0.02	0.05	-0.39	.70	-0.11	0.07
Strong physical pain last four weeks	<0.01	0.05	0.04	.97	-0.1	0.10
Limitations due to physical problems	-0.02	0.05	-0.42	.68	-0.13	0.09
Limited socially due to health	0.04	0.05	0.75	.45	-0.06	0.13
Hospital stays previous year	-0.04	0.04	-0.91	.36	-0.11	0.04
Hours of sleep, workday	0.04	0.04	0.98	.33	-0.04	0.12
Extraversion	-0.03	0.04	-0.76	.45	-0.12	0.05
Neuroticism	0.04	0.05	0.95	.34	-0.05	0.14
Openness	-0.03	0.05	-0.72	.47	-0.12	0.06
Agreeableness	-0.06	0.04	-1.54	.12	-0.14	0.02
Conscientiousness	-0.11	0.04	-2.53	.01	-0.19	-0.02
Inquisitive	0.10	0.05	2.14	.03	<0.01	0.19

Table 9: Multiple linear regression model including all personality-related variables (in addition to significant well-being- and health-related variables) as well as socio-demographic variables). The dependent variable is the second FTP factor: focus on limitations.

	β	SE	t	p	Lower 95% CI	Upper 95% CI
Intercept	2.26	0.16	14.57	<.001	1.96	2.57
Sex (Female)	<0.01	0.08	0.03	.98	-0.15	0.16
Relationship (Yes)	-0.02	0.08	-0.21	.84	-0.18	0.14
Employed (Yes)	<0.01	0.10	0.02	.99	-0.19	0.20
Education (Average)	0.15	0.15	1.03	.30	-0.14	0.44
Education (Above Average)	0.33	0.17	1.96	.05	<0.001	0.66
Age	0.44	0.05	8.71	<.001	0.34	0.54
Satisfaction with health	-0.08	0.06	-0.28	.78	-0.14	0.10
Current life satisfaction	-0.15	0.05	-3.19	.001	-0.24	-0.06
Current health	0.13	0.06	2.00	.05	<0.01	0.26
Pressed for time last four weeks	-0.02	0.05	-0.35	.73	-0.11	0.08
Run-down, melancholy last four weeks	-0.15	0.05	-2.88	<.01	-0.25	-0.05
Well-balanced last four weeks	-0.01	0.05	-0.27	.78	-0.11	0.08
Used energy last four weeks	-0.01	0.05	-0.26	.80	-0.10	0.08
Strong physical pain last four weeks	<0.01	0.05	0.03	.97	-0.10	0.10
Limitations due to physical problems	-0.02	0.06	-0.32	.75	-0.13	0.10
Limited socially due to health	0.03	0.05	0.62	.54	-0.07	0.13
Hospital stays previous year	-0.03	0.04	-0.84	.40	-0.11	0.04
Hours of sleep, workday	0.04	0.04	1.00	.32	-0.04	0.12
Conscientiousness	-0.12	0.04	-2.99	<.01	-0.21	-0.04
Inquisitive	0.07	0.04	1.64	.10	-0.01	0.15

Table 10: Final multiple linear regression model for the second FTP factor (focus of limitations).

4 Discussion

The present study aimed at replicating previous findings on relationships between FTP and various measures of well-being, health, and personality as well as socio-demographic variables. In doing so, the structure of FTP was examined using explorative factor analysis. Results indicated that FTP consists of two factors, namely, focus on opportunities and focus on limitations. Relationships were examined using correlation analyses and multiple linear regression models.

Although reported by previous studies (e.g., Strough et al., 2016), no statistically significant effects of gender were found. This discrepancy might be explained by differences in considered covariates which might have affected the relationship between gender and FTP. In contrast, age effects were found to be statistically significant for both FTP factors. For focus on opportunities, analyses revealed a negative effect, indicating that with increasing age people tend to perceive their future as being less filled with opportunities and possibilities. For focus on limitations, a positive effect was found. Hence, with increasing age people tend to perceive their time as increasingly limited. These findings are in line with the socioemotional selectivity theory. The meta-analysis by Kooij et al. (2018) reported an inverted U-shaped relationship between FTP and age. However, the authors did not discriminate between both factors but rather used FTP as a one-dimensional measure of the perceived remaining time and opportunities. Hence, the present results are not in contrast with those of Kooij et al. (2018) but rather complement them by considering FTP as a two-dimensional construct. With respect to the role of socioeconomic status, no statistically significant effects of the amount of education and relationship status were found. The effect of employment status was only found to be statistically significant in the final model for focus on opportunities. This effect indicated that employed people tend to stronger focus on future opportunities and possibilities

compared to those not employed. However, it has to be noted that the effect is only significant if additional variables are controlled for (i.e., included in the regression model).

Examination of well-being measures revealed a positive effect of current life satisfaction on focus on opportunities. For focus on limitations, negative effects of current life satisfaction and satisfaction with health were found. Hence, with increasing life satisfaction, future time is perceived as increasingly filled with opportunities and as less limited. Similarly, the higher the satisfaction with health, the less people tend to perceive time as limited. These findings are in line with the results of Kooij et al. (2018) showing a positive relationship between life satisfaction as well as subjective health and (open-ended) FTP.

With respect to health-related variables, a negative effect of the item “used energy in the last 4 weeks” on focus on opportunities was found. Hence, on average, higher perceived energy consumption in the last 4 weeks (low item values) leads to perceiving future time as more filled with opportunities (higher values on the first FTP factor). For focus on limitations, a negative effect of the item “melancholy over the last 4 weeks” was shown. Thus, the higher the frequency of melancholic feelings over the last 4 weeks (low item values), the more limited future time is perceived (higher values on the second FTP factor). The latter result is in line with other studies showing a negative relationship between negative feelings and the construct of FTP (Kooij et al., 2018).

Examination of effects of personality-related variables revealed positive effects of the personality traits openness and extraversion as well as the item “inquisitive” (eager for knowledge) on focus on opportunities. These results are in line with previous research which suggests that people who score higher on these personality traits also tend to have stronger motivation and show higher goal pursuit behaviour. Hence, people with high scores on these personality traits would perceive the future as more filled with opportunities (Kooij et al., 2018). For focus on limitations, a negative effect of conscientiousness was found. In the literature, conscientiousness is hypothesized to have a positive relationship with FTP as a one-dimensional construct. With respect to the present two-dimensional operation of FTP, this would imply that the more conscientious a person is, the less he/she will perceive future time as limited (Kooij et al., 2018).

Limitations of the present study include the focus on linear relationships and the missing discrimination between antecedents, moderators, and outcomes of FTP. Hence, for future research, it would be valuable to further explore the reported relationships using non-linear and structure equation models. The latter comes along with the additional advantage of providing complementary information on the relationship between both FTP factors. Since FTP has only been measured once in the SOEP-IS so far, it was not possible to analyze longitudinal data. However, including longitudinal data would be useful for future research in order to examine causality of the reported effects. In addition, it has to be considered that the sample was not balanced with respect to age. More specifically, it included more elderly than young people. Lastly, it should be noted that the order and strategy of including independent variables has to be considered when interpreting effects. Hence, effects of well-being, health, and personality were controlled for socio-demographic variables (i.e., gender, age, relationship status, employment status, amount of education).

In summary, the present study contributes to the discussion of the dimensionality of FTP. The value of the study lies in discriminating between both factors of FTP and their associated relationships with various measures of well-being, health, and personality as well as socio-demographic variables. Due to the cross-sectional nature of the applied data analyses, causality of effects remains open for future research.

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