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The Limits of a Limited Future Time Perspective in Explaining Age Differences in Emotional Functioning

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Although a limited future time perspective (FTP) has been theorized to be the underlying mechanism of positive emotional functioning later in life, there is scant empirical evidence for this position. Using an integrative data-analytic approach, we investigated the predictive value of FTP, age, and subjective health in explaining emotional functioning in a sample of 2,504 adults (17 to 87 years, $M = 35.5$, $SD = 14.2$). Although older adults reported a more limited FTP than younger adults, age and a limited FTP had opposite effects in predicting subjective well-being, affect, positive emotions, empathy, and attitudes toward emotions. That is, old age was linked to a more adaptive emotional profile, whereas a limited FTP was linked to a more maladaptive emotional profile. This was the case even after controlling for health-related aspects. The findings question the usage of FTP as an explanatory variable for observed age differences in emotional functioning.

Keywords: future time perspective, emotional functioning, socioemotional selectivity theory, affect, empathy

> People are always aware of time—not only of clock and calendar time, but of lifetime. . . . As people move through life they become increasingly aware that time is in some sense "running out." . . . We argue that the approach of endings is associated with heightened emphasis on feelings and emotion states. Activities that are unpleasant or simply devoid of meaning are not compelling under conditions in which time is perceived as limited. Interest in novel information, because it is so closely intertwined with future needs, is reduced. Instead, when endings are primed people focus on the present rather than on the future or the past, and this temporal shift leads to an emphasis on the intuitive and subjective rather than the planful and analytical. (Carstensen, Isaacowitz, & Charles, 1999, pp. 165–166)

Future time perspective (FTP) is an integral part of socioemotional selectivity theory (SST; Carstensen et al., 1999) in positing that a shift in a person's time perspective also shifts that person's emphasis on knowledge-related versus emotionally gratifying motives. Specifically, when time is perceived as expansive (i.e., open-ended), knowledge-related goals are prioritized; when time is perceived as limited (i.e., running out), however, emotional goals assume primacy. For example, a person with an expanded time horizon might focus more on the long-term outcomes of an education for a career rather than the short-term orientation toward a grade (Simons, Dewitte, & Lens, 2004). In contrast, when time is perceived as limited, goals are more oriented toward things that are emotionally gratifying. Thus, a person with a limited time horizon might focus on pleasurable social motives, such as drinking wine with friends, rather than knowledge-related motives, such as learning to play a new instrument. As the quote above suggests, it is theorized that persons with a limited FTP should focus on the present rather than on the future. Given that chronological age is a good proxy for the time left in life (Kotter-Grühn, Grühn, & Smith, 2010), older adults should have a more limited FTP than younger adults (Lang & Carstensen, 2002). Thus, older persons, compared with younger persons, are thought to be motivated toward present and emotionally gratifying goals rather than future and knowledge-related goals (Charles & Carstensen, 2010). Due to these theoretical links, FTP has been conceptualized to be a driving force behind age differences in motivational and emotional processes (Carstensen et al., 1999).

As people age, the time left in life becomes smaller and the perceived FTP should theoretically become more constrained (Lang & Carstensen, 2002). Indeed, the empirical findings from cross-sectional and longitudinal studies support this predicted age pattern. In cross-sectional adult samples, the correlation between chronological age and FTP has been consistently negative, that is, older adults reported a more limited FTP than younger adults. For example, Lang and Carstensen (2002) found a strong negative correlation, $r = -.70$, for 480 adults ranging between 20 and 90 years of age. Allemand, Hill, Ghaemmaghami, and Martin (2012) found a similar strong negative correlation, $r = -.66$, in a sample of 962 adults between the ages of 19 to 84 years. Coudin and Lima (2011), in a large cross-cultural study, collected data from over 40,000 adults in 23 countries and found a smaller negative correlation, $r = -.22$, between age and two items measuring FTP. Kotter-Grühn and Smith (2011) investigated the relation between age and a single item of future orientation in a longitudinal sample of older adults (70 to 104 years old). Linear growth models indicated that future orientation decreased significantly by age; the decline represented roughly 1 *SD* over 20 years. Thus, people have some idea about time that is consistently linked to chronological age. Moreover, FTP has been shown to reflect actual remaining

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lifetime. Kotter-Grühn et al. (2010) found that subjective nearness to death in old age was a significant predictor of mortality, that is, people who thought their time was running out (i.e., had a limited FTP) were more likely to die within 16 years. And among the persons who died, subjective nearness to death was linked to objective nearness to death, that is, as people approached their actual death, they perceived their time more and more as running out. This was the case even after controlling for chronological age and subjective and objective health indicators. Thus, people are indeed aware of their lifetimes—as specified in socioemotional selectivity theory (Carstensen et al., 1999).

One way in which future time perspective reflects actual lifetime is by incorporating health information into estimating time left in life. Persons may use details about their general health status or health-related behaviors in forming judgments about FTP. For example, in healthy young and middle-aged adults (Kooij & Van De Voorde, 2011), a limited FTP was linked to poorer self-reported health. Even after controlling for chronological age, FTP was more limited for disabled or chronically ill adults than for healthy adults (Coudin & Lima, 2011). Similarly, persons with a limited FTP, in contrast to persons with an open-ended FTP, were engaged in less physical activity (Stahl & Patrick, 2012), reported a lower intake of fruits and vegetables (Gellert, Ziegelmann, Lippke, & Schwarzer, 2012), were more likely to smoke (Sansone et al., 2013), and were also less likely to cease smoking (Hall, Fong, & Meng, 2014). Thus, people may integrate these health indicators into their FTP.

The age-related shift in social motives is thought to go along with a shift in emotional functioning. In particular, it has been argued that a focus on emotionally gratifying goals leads to better emotion regulation (Gross et al., 1997) and improved emotional experiences (Carstensen et al., 2011) with age. For example, the general finding that older adults tend to report higher levels well-being than younger adults (e.g., Grühn, Kotter-Grühn, & Röcke, 2010) is often, at least implicitly, associated with the theoretical framework of SST. For example, Carstensen (2006) argued that SST "helped to make sense of a number of findings in the literature previously referred to as the [well-being] paradox of aging" (p. 1914; for the paradox, see Kunzmann, Little, & Smith, 2002). Similarly, Carstensen and colleagues (2011) stated that, based on "reasoning from SST, emotional experience improves with age" (p. 22). The general idea is that older adults' emphasis on emotionally gratifying goals also underscores a maximization of positive affect and a minimization of negative affect (e.g., Charles, Reynolds, & Gatz, 2001). Thus, one should expect that if the age-related shift in social motives is triggered by an age-related shift in FTP, then FTP should be directly linked to those positive outcomes of improved well-being that have been implicated in the age-related shift in social motives. Despite its theoretical relevance as an explanatory construct for observed age differences in social-emotional functioning, few studies have actually measured FTP and investigated the direct links to the associated positive outcomes (e.g., improved emotion regulation, heightened positive affect).

Contrary to the idea that a limited FTP prompts well-being, cross-sectional studies have found that persons with a limited FTP tend to report (a) lower psychological well-being (Demiray & Bluck, 2014), (b) lower subjective well-being (Allemand et al., 2012; Hicks, Trent, Davis, & King, 2012), and (c) lower life satisfaction, more depressive symptoms, and less optimism (Coudin & Lima, 2011; Ramsey & Gentzler, 2014). Kessler and Staudinger (2009) found no association between affect and FTP in a sample of 277 adults (20 to 80 years of age); however, they found that individuals with more limited time perspectives reported less efficiency in reducing negative affect after failure than did persons with more open-ended time perspectives. Supplementing these findings, using 14-year longitudinal data from older adults, Kotter-Grühn and Smith (2011) found that within-person changes of future time orientation were positively related to within-person changes of subjective well-being; specifically, a decline in future time orientation (i.e., more limited) was linked to a decline in subjective well-being.

In sum, the initial empirical findings have not been consistent with the idea that a limited FTP is associated with positive emotional outcomes. One reason might be that other factors, such as health impairments linked to a limited FTP, might overshadow potential positive outcomes of the emotion-focused motives triggered by a limited FTP.

The Present Study

SST is a dominant theoretical framework in the social aging literature. The dominance is partly due to the idea that it can explain observed age differences in emotional functioning, that is, SST might provide the framework for explaining why older adults tend to report more positive (and less negative) affect than younger adults and why older adults seem to do relatively well in terms of emotional functioning. However, most of the empirical research did not include a measure of FTP as the key explanatory variable within the framework of SST, which is a deficit in testing the theory. Thus, the goal of the present study was to provide a more in-depth investigation of the association network of FTP in an adult life-span sample. In particular, we were interested in whether health-related aspects may overshadow the positive links between a limited FTP and better emotional functioning, as suggested by proponents of SST (e.g., Charles & Carstensen, 2007). To do this, we first investigated the age-related and health-related patterns of FTP across the adult life span. Consistent with past research, we expected that older adults and persons in poor health would report a more limited FTP than younger adults and persons in good health. Controlling for the effects of age and subjective health, we then tested whether a more limited FTP was indeed linked to (a) a greater focus on the present rather than on the future, (b) heightened positive and diminished negative affects, (c) greater subjective well-being, and (d) a broader scope of emotional functioning, including empathy, positive emotions, and attitudes toward emotions.

Method

Procedure and Participants

We applied an integrative data-analytic approach (Curran & Hussong, 2009) by combining the samples of nine studies in which FTP was assessed. Integrative data-analysis pools multiple data sets into one. In these studies, all relevant constructs for the present analyses were measured within the general assessment of demographic, personality, and emotional constructs at the beginning of

the study. In all studies, the assessment was implemented via an online survey tool (Unipark/Questback, New York, NY). In addition, all nine studies used basically the same scale format for each measure, thereby avoiding potential problems of different scale formats.

The final sample included 2,505 adults ranging in age from 17 to 87 years ($M = 35.5$, $SD = 14.2$, 55.4% women). The final sample was derived from a larger compiled survey collected between February, 2010 and October, 2014. In total, the compiled survey was opened 3,339 times; however, 415 times, the survey was closed right after opening the first page, which introduced the study. Thus, these persons left no data and the corresponding cases were excluded. Of the remaining 2,924 cases, 178 cases were excluded because they stopped responding to the survey before reaching the end. After implementing three data-quality checks, 232 additional cases were excluded. First, cases were excluded if they just clicked through the pages rather than answering the questions on the pages (some of those might actually be due to lab members who checked whether the survey functioned properly). Second, cases were excluded if they showed unusual response patterns across questionnaires, such as responding with the very same value throughout the survey or switching between extreme values (if these switches didn't correspond to positively and negatively framed items). Third, cases were excluded if they provided inconsistent or improbable information. For example, one 18-year-old man reported having five children. Although we can imagine scenarios in which this might have been the case, we decided to exclude this case. Other cases were excluded because of inconsistent age information. Chronological age was assessed twice on separate pages: (a) in a free format indicating the years and (b) in a dropdown menu indicating the birth month and birth year. If the age didn't match, cases were excluded. Cases failing the data-quality checks tended to fail more than one criterion.

In the final sample, 529 persons were recruited from the local community or from psychology classes at North Carolina State University, with students receiving partial course credit. Adults in this local sample ranged in age from 18 to 87 years ($M = 39.1$, $SD = 16.3$, 58.4% women). The remaining 1,976 participants were recruited via Amazon's Mechanical Turk (MTurk; for evidence of the validity of MTurk samples, please see Behrend, Sharek, Meade, & Wiebe, 2011; Buhrmester, Kwang, & Gosling, 2011). Recruitment in MTurk was limited to persons living in the U.S. Adults in this online sample ranged in age from 18 to 85 years ($M = 34.5$, $SD = 13.4$, 54.7% women). The local sample was slightly older, $F(1, 2504) = 44.6$, $p < .01$, $\eta^2 = .018$, than the online sample. Both samples had, however, an equal distribution of men and women, $\chi^2(1) = 1.84$, $p = .17$.

The total sample consisted of 77.6% European Americans (local sample: 79.8%, online sample: 77.0%); 6.1% African Americans (local sample: 8.3%, online sample: 5.6%); 6.0% Asian Americans (local sample: 4.0%, online sample: 6.5%); 5.2% Hispanic descent (local sample: 2.9%, online sample: 5.8%); and 5.1% of mixed or other racial groups, such as Native Americans (local sample: 5.1%, online sample: 5.0%). In terms of marital status, 40.2% were single and never married (local sample: 40.3%, online sample: 40.2%); 49.3% were married or living in a long-term relationship (local sample: 45.9%, online sample: 50.5%); 8.8% were divorced (local sample: 10.8%, online sample: 8.1%); and 1.6% were widowed (local sample: 3.0%, online sample: 1.2%).

Measures

Given the integrative data-analytic approach of compiling data across several studies, missing data were common. Not all studies assessed all constructs and even if a construct was assessed, some persons may not have scored on a construct (e.g., for a technical reason or the question was skipped). To describe missing values appropriately, the following description of each measure contains the number of persons who provided valid responses on that construct, as well as the corresponding age and sex distribution.

Time perception. FTP was assessed with the 10-item FTP questionnaire (full sample: $N = 2,504$; Carstensen & Lang, 1996) on a 7-point scale ranging from *strongly disagree* (1) to *strongly agree* (7). Internal consistency was high, $\alpha = .90$. In addition to FTP, we created three single-item measures of Thinking About the Past ($n = 2,284$, ages 18 to 87, $M = 35.2$, $SD = 14.1$, 54.1% women), Thinking About the Present ($n = 2,273$, ages 18 to 87, $M = 35.2$, $SD = 14.1$, 54.4% women), and Thinking About the Future ($n = 2,260$, ages 18 to 87, $M = 35.2$, $SD = 14.1$, 54.5% women). In particular, for all three time frames—the Past, the Present, and the Future—we asked participants how often they had thought about each of those three time frames during the past week (i.e., "How often during the past week did you spend time thinking about . . .") on a 4-point scale from *rarely or never* (1) to *most or all of the time* (4).

Subjective health. Subjective health (full sample: $N = 2,504$) was assessed with a single item (i.e., "Overall, how would you rate your physical health?") on a 7-point scale from *poor* (1) to *excellent* (7).

Affect. Affect was assessed using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Depending on the study, participants received either a Trait Version ($n = 1,488$, ages 18 to 84, $M = 34.5$, $SD = 12.8$, 53.4% women) or a Past Week Version ($n = 921$, ages 18 to 87, $M = 37.6$, $SD = 16.1$, 57.3% women). The Trait Version asked how often—in general—the participant felt 20 emotion states assessed on a 7-point scale from *very rarely* (1) to *very frequently* (7). The Past Week Version asked how often—in the past week—the participant felt the 20 emotion states on a 4-point scale from *rarely or never* (1) to *most or all of the time* (4). Internal consistencies were high for both the Trait Version (Negative Affect: $\alpha = .93$, Positive Affect: $\alpha = .91$) and the Past Week Version (Negative Affect: $\alpha = .91$, Positive Affect: $\alpha = .90$).

Subjective well-being. For subjective well-being more generally, we assessed Life Satisfaction ($n = 1,650$, ages 18 to 84, $M = 35.3$, $SD = 13.0$, 53.9% women) and Depressive Symptoms ($n = 2,430$, ages 18 to 87, $M = 35.7$, $SD = 14.2$, 55.0% women). Life Satisfaction was measured with a single item (i.e., "Overall, how satisfied are you with your life?") from *extremely unsatisfied* (1) to *extremely satisfied* (7). Depressive Symptoms were measured using the Center for Epidemiological Studies–Depression Scale (CES-D; Radloff, 1977) for symptoms occurring during the last week. Responses were recorded on a 4-point scale from *rarely or never* (1) to *most or all of the time* (4). Internal consistency was high, $\alpha = .93$.

Emotional functioning. To capture a broad spectrum of emotional functioning, we investigated the links between FTP and self-reported empathy (n = 442, ages 18 to 84, M = 38.0, SD = 13.9, 54.2% women), dispositional positive emotions (n = 1,046, ages 18 to 83, M = 32.8, SD = 11.5, 53.2% women), and attitudes toward emotions (n = 1,192, ages 18 to 83, M = 34.1, SD = 12.3, 54.0% women). For empathy, participants completed the Empathic Concern (seven items) and Perspective Taking (seven items) subscales of the Interpersonal Reactivity Index (Davis, 1983), as well as the eight-item Empathy Quotient (Loewen, Lyle, & Nachshen, 2010). All three were assessed using a 7-point scale from *strongly disagree* (1) to *strongly agree* (7). Internal consistencies were adequate (Empathic Concern: α = .84, Perspective Taking: α = .81, Empathy Quotient: α = .83). Positive emotions were measured with three subscales of the Dispositional Positive Emotions Scale (Shiota, Keltner, & John, 2006): Pride (five items), Content (five items), and Awe (six items). The items were assessed on a 7-point scale from *strongly disagree* (1) to *strongly agree* (7). Internal consistencies were adequate (Pride: α = .85, Content: α = .93, Awe: α = .86). The Attitudes Toward Emotion Scale (Harmon-Jones, Harmon-Jones, Amodio, & Gable, 2011) measures how much a person likes or dislikes experiencing five discrete emotional states: Joy (five items), Anger (five items), Disgust (six items), Sadness (six items), and Fear (six items). Items were assessed on a 7-point scale from *strongly disagree* (1) to *strongly agree* (7) and internal consistencies were adequate (Anger: α = .85, Joy: α = .86, Sadness: α = .78, Disgust: α = .85, Fear: α = .90).

Results

We conducted preliminary analyses by investigating group differences in FTP, as well as links between age, health, and FTP. Then, we conducted several structural equation models (SEMs) using Chronological Age, FTP, and Self-Reported Health as predictors for the different outcomes of (a) thinking about time, (b) affect, (c) subjective well-being, (d) empathy, (e) dispositional positive emotions, and (f) attitudes toward emotion. Separate models were run using Mplus (Muthén & Muthén, 1998–2010). Given the sample size, even small effects reached conventional significance levels; thus, an emphasis was placed on the size of the effect rather than on the significance level.

Preliminary Analyses

As a first step, we examined group differences in FTP by running simple ANOVAs with FTP as the dependent variable and the corresponding grouping variable as the between-subjects variable. These analyses were exploratory, given that past research has been largely silent about the presence or absence of basic group differences in FTP. In particular, we investigated the type of sample (online vs. local), sex, race, and marital status.

There were no significant main effects of sample, $F(1, 2504)$ = 1.5, p = .22, η^2 = .001, or sex, $F(1, 2504)$ = 2.7, p = .09, η^2 = .001. Thus, the local sample (M = 4.46, SD = 1.34) and the online sample (M = 4.38, SD = 1.23), as well as men (M = 4.35, SD = 1.19) and women (M = 4.43, SD = 1.30), reported similar levels of FTP on average. There was a significant main effect of racial/ethnic group, $F(1, 2487)$ = 3.6, $p < .01$, η^2 = .006. Follow-up pairwise analyses revealed two significant comparisons: The African Americans (M = 4.72, SD = 1.20) had more expansive FTPs than European Americans (M = 4.36, SD = 1.26), $F(1, 2085)$ = 11.5, $p < .01$, η^2 = .005, and Asian Americans (M = 4.33, SD = 1.12), $F(1, 300)$ = 8.2, $p < .01$, η^2 = .027. However, the effects were small. Marital status also revealed a significant main effect, $F(1, 2076)$ = 7.6, $p < .01$, η^2 = .011. Specifically, singles (M = 4.50, SD = 1.21) had more expansive FTPs than married (M = 4.29, SD = 1.26) and divorced (M = 4.16, SD = 1.54) persons, who had more expansive FTPs than widowed persons (M = 3.85, SD = 1.23). Marital status is, however, confounded by chronological age. When entering age as a covariate, the main effect of marital status drops to nonsignificance, $F(1, 2074)$ = 1.0, p = .40, η^2 = .001. In sum, FTP seems to vary little by group membership.

In a second step, we examined the raw intercorrelations among the three predictors: FTP, self-reported health, and chronological age. As expected, FTP was negatively correlated with chronological age, r = −.29, $p < .01$. Thus, older adults reported more limited FTP than younger adults. FTP was also significantly correlated with self-reported health, r = .34, $p < .01$; the better the reported health, the more expansive was the perceived FTP. We found it interesting that age and self-reported health were not significantly correlated, r = −.02, p = .32. Table 1 provides the raw correlations between the three predictors and all individual outcome variables.

Table 1
Correlations Between Predictor Variables and the Outcome Variables With the Corresponding Sample Size

Constructs	Sample size	Correlations with . . . Age	FTP	Subjective health
Thinking about time				
Past	2,284	−.06**	−.18***	−.13***
Present	2,273	.08***	.07**	.02
Future	2,260	−.15***	.12***	.03
General affect				
Positive affect	1,488	.08**	.37***	.27***
Negative affect	1,487	−.14***	−.28***	−.18***
Past-week affect				
Positive affect	921	.13***	.32***	.38***
Negative affect	921	−.26***	−.17***	−.29***
Subjective well-being				
Life satisfaction	1,650	.03	.48***	.44***
Depressive symptoms	2,430	−.23***	−.41***	−.36***
Empathy				
Perspective taking	442	.05	.21***	.05
Empathetic concern	452	.11*	.24***	.05
Empathy quotient	441	.06	.28***	.09*
Positive emotions				
Pride	1,044	.06*	.50***	.31***
Contentment	1,045	.08*	.57***	.38***
Awe	1,046	.10**	.44***	.24***
Attitudes toward emotion				
Joy	1,193	.11***	.28***	.14***
Anger	1,192	−.23***	−.03	.02
Sadness	1,190	−.15***	−.03	−.03
Fear	1,191	−.30***	.11***	.03
Disgust	1,193	−.31***	−.02	.01

Note. FTP = future time perspective.
* $p < .05$. ** $p < .01$. *** $p < .001$.

FTP, Age, and Health as Predictors

For the main research question of whether the limited FTP construct is directly linked to improved emotional functioning, we conducted separate SEMs. The basic structure among the predictor factors was similar across models. Self-Reported Health was regressed on Age, and FTP was regressed on both Age and Self-Reported Health. Age and Self-Reported Health were single-item measures and were directly used as manifest variables in the model. For FTP, we created parcels as recommended by Little and colleagues (Little, Cunningham, Shahar, & Widaman, 2002). Parcels are often used in SEMs to create indicator factors that show enhanced distribution qualities, as a composite of several items is more likely to be normally distributed than each individual item. The 10 items were combined into three parcels alternately based on their original order in the questionnaire (i.e., Parcel 1: 1, 4, 7, 10; Parcel 2: 2, 5, 8; Parcel 3: 3, 6, 9) and then used as indicators for a latent factor, FTP. Please note that items were actually presented in random order in the online survey. Age, Self-Reported Health, and FTP were then used to predict different groups of outcome constructs.

Given the integrative data-analytic structure of the data, the available sample size for the outcome variables varied. Structural equation modeling can handle missing data by using full-information maximum likelihood with multiple imputations. Missing values were primarily driven by whether the corresponding question was actually assessed or not in the corresponding subsample; thus, missingness was for the most part completely at random.

Thinking about the past, present, and future. SST predicts that a limited FTP should lead persons to focus more on the present than on the future (or past). Thus, we used Age, Self-Reported Health, and FTP to predict the three single-item constructs of Thinking About the Past (n = 2,284), Thinking About the Present (n = 2,273), and Thinking About the Future (n = 2,260). The model showed adequate fit to the data, $\chi^2(10) = 87.8$, $p < .01$, comparative fit index (CFI) = .99, Tucker–Lewis index (TLI) = .96, root-mean-square error of approximation (RMSEA) = .056 [.045, .067]. Figure 1A shows the corresponding model with standardized regression weights. Older adults, compared with younger adults, were thinking about the future less, thinking about the past less, and thinking about the present more. A limited FTP was, however, predictive of thinking about the future less, thinking about the present less, and thinking about the past more.

Affect. Positive and Negative Affect were assessed under two different instructions: Trait and Past-Week Versions. For both versions, Positive and Negative Affect were entered as latent constructs. As indicator factors, we created three parcels for Positive Affect and three parcels for Negative Affect. Parcels were based on the order in the PANAS (Watson et al., 1988). The two latent constructs, Positive and Negative Affect, were allowed to covary. Age, Self-Reported Health, and FTP were predictors of Positive and Negative Affect. The model for affect in the past week (n = 921) showed adequate fit to the data, $\chi^2(36) = 257.7$, $p < .01$, CFI = .98, TLI = .96, RMSEA = .050 [.044, .055] as did the model for trait affect (n = 1,488), $\chi^2(36) = 251.9$, $p < .01$, CFI = .98, TLI = .97, RMSEA = .049 [.043, .055]. Figure 1B displays the model with the corresponding estimates. Estimates above the line are for affect in the past week and estimates below the line are for affect in general. Older adults reported less negative affect and more positive affect than younger adults. A limited FTP as well as poor self-reported health were linked to increased levels of negative affect and decreased levels of positive affect. This pattern was largely the same for both trait and past week versions measuring affect.

Subjective well-being. The 20 items in the CES-D (Radloff, 1977) were composed in three parcels based on the order in the questionnaire. The three parcels were then used as indicators for a latent factor, Depressive Symptoms (n = 2,430). In addition, the single-item Life Satisfaction (n = 1,650) was included as an outcome construct. The latent factor, Depressive Symptoms, and the manifest factor, Life Satisfaction, were allowed to covary. The model showed adequate fit to the data, $\chi^2(20) = 239.1$, $p < .01$, CFI = .98, TLI = .97, RMSEA = .066 [.059, .074]. Figure 1C shows the model with subjective well-being as outcomes. Older adults reported fewer depressive symptoms and higher levels of life satisfaction. In contrast, a more limited FTP as well as poor self-reported health were related to more depressive symptoms and lower levels of life satisfaction.

Empathy. We used the scale scores for Empathic Concern, Perspective Taking, and the Empathy Quotient as indicators for a latent Empathy construct (n = 442). Age, self-reported health, and FTP were predictors of Empathy. The model showed adequate fit to the data, $\chi^2(16) = 96.2$, $p < .01$, CFI = .99, TLI = .97, RMSEA = .045 [.036, .054]. The model is displayed in Figure 2A. Older adults reported more empathy than younger adults. A limited FTP was, however, related to lower self-reported empathy. Subjective health was not a significant predictor of empathy.

Dispositional positive emotions. The three subscales of the Dispositional Positive Emotions Scale—Awe, Pride, and Content—were used as indicators for a latent factor of Dispositional Positive Emotions (n = 1,046). Age, Self-Reported Health, and FTP were predictors of the latent factor Positive Emotions. The model showed adequate fit to the data, $\chi^2(16) = 141.1$, $p < .01$, CFI = .98, TLI = .96, RMSEA = .056 [.048, .065]. Figure 2B shows the model with the corresponding regression values. Older adults and persons with open-ended FTP and in excellent health reported higher levels of dispositional positive emotions than younger persons and persons with limited FTP and in poor health.

Attitudes toward emotion. To keep the model simple, the five subscales (i.e., Joy, Anger, Disgust, Sadness, and Fear) of the Attitudes Toward Emotion Scale (n = 1,192) were treated as manifest outcome constructs in the model. Age, Self-Reported Health, and FTP were predictors of the five discrete attitudes. The model showed adequate fit to the data, $\chi^2(14) = 105.4$, $p < .01$, CFI = .99, TLI = .95, RMSEA = .051 [.042, .060]. However, all regression paths from Self-Reported Health to the five attitudes were nonsignificant ($p > .10$). To simplify the presentation of this model, we omitted Self-Reported Health from the model and reran it. This modified model is displayed in Figure 2C and the model also showed adequate fit to the data, $\chi^2(12) = 100.2$, $p < .01$, CFI = .99, TLI = .95, RMSEA = .054 [.045, .064]. Older adults were more inclined to experience Joy and less motivated to experience Anger, Sadness, Fear, and Disgust. Persons with a more limited FTP, in contrast to persons with a more open-ended FTP,

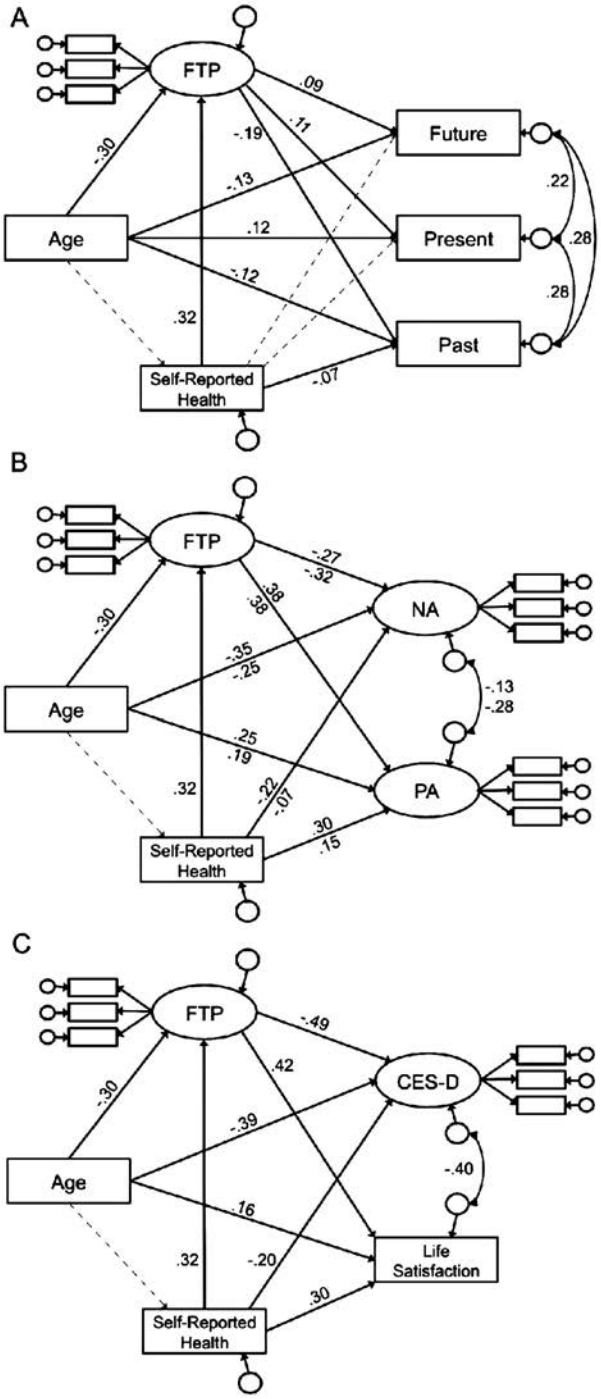


Figure 1. Structural equation models with future time perspective (FTP), chronological age, and self-reported health as predictors for different outcome constructs. Figure 1A uses thinking about time as outcome with thinking about the future, the past, and the present. Figure 1B uses the two versions of Positive Affect (PA) and Negative Affect (NA) as outcomes; estimates above the line are for affect in the past week and estimates below the line are for affect in general. Figure 1C uses measures of subjective well-being as outcomes; in particular, life satisfaction and depressive symptoms. Displayed values are significant standardized regression weights; all *p*s $< .01$. Dashed gray lines were nonsignificant paths. For visual clarity, all other model values (e.g., error variances, factor loadings) were omitted from the figures. CES-D = Center for Epidemiological Studies–Depression Scale.

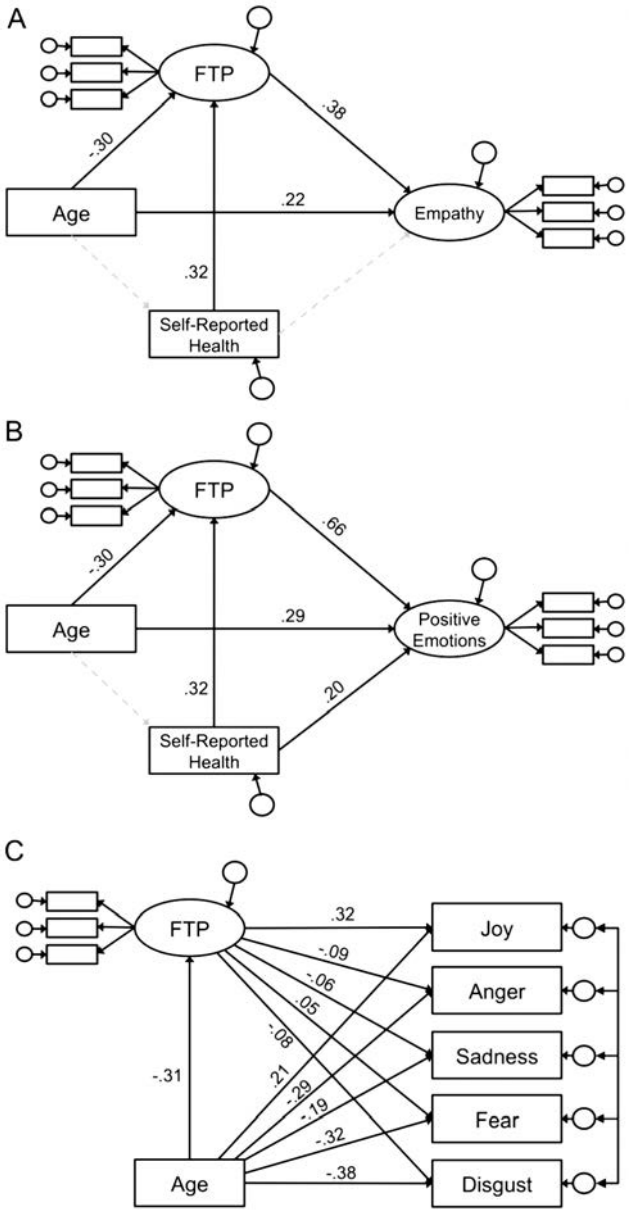


Figure 2. Structural equation models with future time perspective (FTP), chronological age, and self-reported health as predictors for different outcome variables. The outcome constructs in Figures 2A and 2B were empathy and positive emotion, respectively. Both constructs' scores came from three scales. Figure 2C uses five emotion subscales from the Attitudes Toward Emotions Scale as outcome constructs. In this model, all paths from self-reported health to the five Attitudes Toward Emotions subscales were nonsignificant. To simplify the presentation, we dropped self-reported health from the model. Displayed values are significant standardized regression weights; all *p*s $< .01$. Dashed gray lines were nonsignificant paths. For visual clarity, all other model values (e.g., error variances, factor loadings) were omitted from the figures. In particular, all covariances among the five emotion attitudes were significant.

were motivated to experience less joy and fear and more anger, sadness, and disgust. However, the paths from FTP to the attitudes of experiencing anger, sadness, fear, and disgust were small—sharing less than 1% of the variance.

Follow-Up Analyses

Potential moderation by age. The main analyses suggested that a limited FTP shows generally the reverse correlation pattern to chronological age. Although there is—to our knowledge—no clear theoretical argument for potential moderating effects between Age and FTP, we ran follow-up regression analyses to clarify potential empirical associations. In particular, for each individual outcome construct, we ran a two-step regression analysis. In Step 1, Age and FTP were included as predictors. In Step 2, the interaction between Age and FTP as well as the quadratic effects of Age and FTP were included. Age and FTP were centered for these analyses. Table 2 shows the standardized regression coefficients for these analyses. Although there were isolated significant effects, all significant higher order effects were small and explained only a small amount of variance. Given the involved sample size, even small variations reached significance. To examine the practical relevance of these effects, we plotted each graph. The quadratic and interaction effects were visually indistinguishable from the linear effects.

Potential moderation by sample. In the preliminary analyses, we found no significant mean differences between the local and the online (i.e., MTurk) samples in the main variables. Despite no mean differences, the pattern of associations among variables might differ between the local and online sample. To address potential concerns about the use of samples recruited online, we ran multigroup SEM models with Sample (Online vs. Local) as grouping variable for all models. We found no evidence for systematic differences between both samples in the structural regression weights. Thus, the pattern of association in both samples was the same.

Discussion

The main objective of the current study was to investigate the relation between FTP and indicators of emotional functioning, broadly defined, controlling for the effects of age and subjective health. In particular, we wanted to test the idea that a limited FTP may function as an explanatory variable for observed age differences in emotional functioning. There were three major findings. First, chronological age and subjective health were indeed substantial predictors of FTP, that is, older adults and persons with poor health reported a more limited FTP than younger adults and persons with excellent health. Second, and in opposition to the line of argumentation by proponents of SST, a limited FTP was indicative of a maladaptive profile of emotional functioning even after controlling for the effects of subjective health. Third, persons with a limited FTP seem to think more about the past than about the present and future.

Not surprisingly, older adults reported a more limited FTP than younger adults. This finding is consistent with past empirical findings from cross-sectional (Allemand et al., 2012; Coudin & Lima, 2011; Lang & Carstensen, 2002) and longitudinal studies (Kotter-Grühn & Smith, 2011), indicating that individuals have

Table 2
Standardized Regression Analyses Using Chronological Age and Future Time Perspective (FTP) as Well as Quadratic and Interaction Terms in Predicting Individual Outcome Variables

	Step 1			Step 2			
Construct	Age	FTP	R^2	Age × FTP	Age^2	FTP^2	ΔR^2
Thinking about time							
Past	−.14***	−.20***	.045***	.01	.02	.06**	.004*
Present	.08**	.11***	.016***	−.01	.03	.06**	.005**
Future	−.15***	.10***	.031***	−.02	.03	.04	.003
General affect							
Positive affect	.15***	.41***	.166***	−.07**	.01	−.02	.004
Negative affect	−.25***	−.33***	.124***	−.01	.06	−.01	.002
Past-week affect							
Positive affect	.22***	.45***	.177***	−.07**	.09*	−.12	.012**
Negative affect	−.38***	−.34***	.155***	.12**	.01	.06	.011**
Subjective well-being							
Life satisfaction	.09**	.50***	.251***	−.05*	.08**	−.13***	.021***
Depressive symptoms	−.37***	−.52***	.300***	.10***	.00	.08***	.011***
Empathy							
Perspective taking	.11	.25***	.052***	.06	.00	.19***	.034**
Empathetic concern	.22**	.29***	.086***	.09	−.02	.16**	.026**
Empathy quotient	.16*	.32***	.094***	.05	−.03	.13**	.017*
Positive emotions							
Pride	.15***	.52***	.278***	−.06*	.03	−.10***	.011**
Contentment	.17***	.60***	.358***	.01	.06*	−.07**	.008*
Awe	.16***	.48***	.229***	−.02	.04	−.01	.003
Attitudes toward emotion							
Joy	.18***	.32***	.105***	−.05	−.05	.10***	.014***
Anger	−.26***	−.10***	.062***	−.04	.04	−.17***	.028***
Sadness	−.22***	−.07*	.027***	−.03	.11**	−.10**	.018***
Fear	−.25***	.04	.091***	−.02	−.05	−.07*	.007*
Disgust	−.35***	−.10**	.103***	−.01	.06	−.12***	.014***

* $p < .05$. ** $p < .01$. *** $p < .001$.

some idea about their remaining lifetime (Kotter-Grühn et al., 2010). In particular, people may use health information when judging their FTP as limited or open-ended (Kooij & Van De Voorde, 2011). Consistent with this notion, a limited FTP was linked to lower self-reported health in the present study. This pattern of findings seems to be consistent with the pattern observed for indicators of subjective age in that subjective age is substantially associated with age (e.g., Kleinspehn-Ammerlahn, Kotter-Grühn, & Smith, 2008), health (Infurna, Gerstorf, Robertson, Berg, & Zarit, 2010), and mortality (Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009). Thus, people seem able to integrate different sources of information to make relevant predictions about their lives.

Consistent with previous findings (Carstensen et al., 2011; Grühn et al., 2010), older adults showed a more positive and adaptive profile of emotional functioning than younger adults. Older adults, in contrast to younger adults, reported higher levels of life satisfaction, empathy, positive emotion, and higher attitudes toward experiencing joy; and fewer depressive symptoms, lower levels of negative affect, and lower attitudes to experiencing anger, sadness, fear, and disgust. Because older adults also reported more limited FTP than younger adults, it seems only natural to conclude that a limited FTP is also linked to the positive age profile of emotional functioning. Contradicting this speculation, however, our findings indicated that a limited FTP and chronological age posed opposite effects on socioemotional functioning. In particular, a limited FTP predicted higher negative affect and more depressive symptoms, as well as lower levels of life satisfaction, positive affect, empathy, positive emotions, and motivation to experience joy. Altogether, a limited FTP was clearly indicative of a negative and maladaptive profile of emotional functioning. This was the case even after taking subjective health into account. Thus, despite the fact that older adults reported a more limited FTP than younger adults, older adults showed a very positive emotional profile and persons with a limited FTP showed a very negative emotional profile.

We would like to stress that the findings do not contradict the core idea of SST, that is, that a limited FTP is linked to a greater motivation to focus on emotionally gratifying social goals (Carstensen et al., 1999; Charles & Carstensen, 2010). It makes sense that people want to spend time with close friends or family members when endings are approaching (Fredrickson & Carstensen, 1990). For example, before moving to a new city, persons may focus on meeting with as many friends as possible. However, the pattern of findings in the present study has put in doubt the auxiliary hypotheses (Lakatos & Musgrave, 1970) added over the years, that a focus on these emotionally gratifying social motives results in better emotion-regulation skills or subjective well-being. There are at least two flaws in the dominant line of argument that have generally been ignored in the literature. First, motivation is not equal to actual performance. Thus, having a goal does not mean that one will be able to fulfill this goal or that one is good at it. Second, the causes for a limited FTP have been neglected. Although largely speculative, we think the causes for a limited FTP tend to be negative life experiences (e.g., health impairments, loss of a loved one). Thus, if my health is substantially impaired and I think that my time is running out, it seems counterintuitive to think that this situation will then lead to better emotion-regulation outcomes and better subjective well-being, despite my strong motivations for regulating emotions and obtaining well-being. To illustrate these two flaws in the argument with a different health-related example, imagine an obese person who recognizes the limitations of his or her health and therefore focuses more on diet-oriented goals. This part—so far—is consistent with the argument in SST that motivation shifts as the result of recognized limitations. However, it is a different point arguing that the motivational shift due to a limitation results in general behavioral or performance shifts toward a gain. For example, it seems difficult to imagine that an obese person focusing on diet-oriented goals knows better than a nonobese person how to regulate appetite and therefore becomes thinner. The motivation for dieting is not equal to being thin; similarly, the motivation for emotionally gratifying goals doesn't mean that persons are happy and well-adjusted. Goals are sometimes set in areas requiring compensation rather than optimization (Baltes & Baltes, 1990). This example illustrates that the extension of SST over and above the core is questionable and probably requires additional qualifiers. It is, for example, imaginable that an obese person who focuses on diet-oriented goals learns how to better regulate appetite and becomes thinner than an obese person who does not focus on diet-related goals. Thus, compared with other persons with similar limited FTPs, persons who actually focus on emotionally gratifying goals may do better than persons who do not. They may, however, not do better than people with more open-ended FTPs.

There are several potential qualifiers. For example, SST treats FTP as a unidimensional construct. Some authors (Cate & John, 2007), however, have suggested that FTP is a two-factor or multidimensional construct. Although this is not elaborated in the theory, a potential qualifier might be that only specific facets of FTP show the proposed pattern. In a similar vein, we investigated in follow-up analyses whether the effects of FTP were moderated by age, that is, whether FTP has different predictive value for socioemotional functioning in different age groups. Although SST does not seem to incorporate the idea that FTP has different meanings for different age groups, this might be a potential qualifier for the application of the theory. We found, however, limited evidence for this conjecture: If the interaction between age and FTP reached significance in predicting the outcomes, the effects were consistently small and practically irrelevant. Given how small these effects were, we would suggest that future replication studies might elaborate on whether age moderates the effects of FTP. From our current perspective, FTP has practically the same association to socioemotional outcome variables in younger and older adults.

The present study also found that FTP predicts individuals' focus on the past, present and future in different ways than chronological age. Older adults were more likely to think about the present than the past or future, however, this relationship was not—as predicted by SST—mediated by a limited FTP. In contrast, persons with limited FTPs were thinking less about the future and the present, and more about the past. This may be related to the use of reminiscence and the constructive use of autobiographical memory in older age (Wong & Watt, 1991). For instance, Leist, Ferring, and Filipp (2010) examined the number of positive and negative autobiographical memories in a sample of middle-aged to older adults (ages 41 to 86 years). The researchers found that older adults perceived themselves as having less residual time left and engaged in using autobiographical memory to create meaning. In

addition, the number of positive life events remembered increased with age, suggesting that individuals who perceive their future to be limited increase their thinking of positive past events. This is consistent with the findings in this study that individuals with limited FTPs think about the past more often than the present and future.

Limitations and Outlook

The main conclusion from the findings of the present study is that a limited FTP is not sufficient in explaining age differences in emotional functioning. Thus, although SST is largely applied to this area as a whole, the explanatory utility may be limited to social motives rather than emotional functioning.

The present study may have some limitations in (a) using a substantial proportion of participants recruited online, (b) lacking the oldest old in the sample distribution, and (c) relying mainly on correlational data from self-report measures. Despite the fact that we found no significant differences between the online (MTurk) and local samples in relevant study variables, it seems possible that the sample recruitment influenced the observed pattern of findings. In particular, MTurk users tend to be less religious, more liberal, and have a higher unemployment rate than the general population (Berinsky, Huber, & Lenz, 2012; Paolacci, Chandler, & Ipeirotis, 2010). Our findings are, however, consistent with findings reported in past research using different types of samples (Allemand et al., 2012; Coudin & Lima, 2011; Demiray & Bluck, 2014; Hicks et al., 2012; Kessler & Staudinger, 2009; Kotter-Grühn & Smith, 2011; Ramsey & Gentzler, 2014). Moreover, it is noteworthy that we did not observe substantial group differences in FTP for other sociodemographic variables. Thus, the meaning and the effects of FTP seem to be consistent across individuals. We find this to be an interesting finding in itself. To investigate this further, future researchers might benefit from examining extreme groups, such as patients with terminal illness or patients with disrupted time perceptions. These extreme groups might provide insights into the function of future time perception.

Similarly, our sample comprised largely young and middle-aged adults and some young older adults. The sample did not include the oldest old (85 years and older). Although we found no substantial (only weak) empirical evidence that age moderated the effects of FTP on socioemotional outcome variables in our sample, it seems possible that the effects would shift for the oldest old, whose experienced endings (i.e., death) are likely more imminent companions than in most other groups. That said, an older age range might have shown evidence that a limited FTP means different things for a younger than for an older person; and thus, future researchers might examine the oldest old in more detail.

Using mainly self-report data is a common limitation in emotion research. Emotional functioning is much easier assessed with self-report methods than with behavioral or observational methods. However, to obtain a broader in-depth picture than the one we provided, the literature on FTP might benefit from employing behavioral outcome measures, such as behavioral measures of the effectiveness of emotion regulation (e.g., Kunzmann, Kupperbusch, & Levenson, 2005) or emotional reactivity (e.g., Kunzmann & Grühn, 2005). Even when considering only self-report data, future researchers may benefit from investigating a more fine-grained portrayal of emotional aspects to disentangle the effects of age and FTP. For example, in the present study, we investigated the associations of FTP to positive and negative affect; however, past findings were suggestive of different age trajectories for (a) high- and low-intensity affects (Kessler & Staudinger, 2009) and for (b) different discrete emotions (Grühn et al., 2010). Given that these facets of affect show different age patterns, associations as well as dissociations with FTP might be more readily observable. One corresponding drawback is the correlational nature of the self-report data, which prevented us from making strong causal arguments about the directionality of the effects. It is well likely that FTP shifts according to emotional states rather than the other way around. A prospective longitudinal study seems desirable. For example, investigating persons before and after an event affecting FTP (e.g., terminal diagnosis) might provide valuable insights. In particular, given that the proposed effect of FTP is thought to be mediated by a focus on emotional goals that shifts more attention to emotional outcomes, this motivational shift probably takes substantial time. A prospective longitudinal study might give clues about the dynamic interplay of these variables. Similarly, future researchers may benefit from incorporating experimental manipulations of FTP in disentangling causal pathways between emotion, FTP, and age. For example, Ersner-Hershfield and colleagues (Ersner-Hershfield, Mikels, Sullivan, & Carstensen, 2008) found that both younger and older adults reported less happiness and more sadness after a limited FTP induction than did persons in the control condition.

As said above, ample empirical evidence points to a limited FTP leading to a focus on emotionally gratifying social motives (e.g., Lang & Carstensen, 2002). However, SST has been expanded beyond this core by including general emotional functioning in the predictive realm of a limited FTP. Previous evidence (e.g., Brothers, Chui, & Diehl, 2014; Demiray & Bluck, 2014) and our present findings do not support this extension. To the contrary, a limited FTP was associated with a maladaptive profile of emotional functioning in the present study. To say this differently, SST does not provide a sufficiently explanatory framework for observed age differences in affect, well-being, and emotional functioning. For the most part, the effects of age and limited FTP were in opposing directions. This finding seems to corroborate four major conclusions for the field of social-emotional aging. First, it questions the usage of age as a proxy for FTP. It also suggests that past findings need to be interpreted cautiously if age was used as a proxy for FTP. Second, it questions the broad application of SST (and limited FTP) in explaining age differences in emotional functioning. Thus, the application realm of SST needs to be specified more clearly to further the growth in social-emotional aging research. For example, SST is primarily a motivational theory and might only apply consistently to motivational aspects and less to actual behavioral or performance aspects. It might also mean that the theory needs to incorporate additional auxiliary support statements to indicate the situations under which it would make statements about nonmotivational aspects. Third, the social-emotional aging literature should consider alternative theoretical models to explain observed age differences in emotional functioning, such as dynamic integration theory (Labouvie-Vief, Grühn, & Studer, 2010), strength and vulnerability integration (Charles & Luong, 2013), or selective engagement theory (Hess, 2014). Finally, although FTP revealed the opposite pattern than that predicted by SST, it showed strong associations to all emotional constructs. Persons with a

more open-ended FTP reported better emotional functioning than persons with a more limited FTP. Thus, the construct of FTP—independent of SST—might be an important one for research on social-emotional aging and deserves more research in analyzing its correlates, consequences, and causes.

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