Present-fatalistic time perspective and life satisfaction: The moderating role of age

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Abstract

Present-fatalistic time perspective refers to a fatalistic, helpless, and hopeless attitude towards the future and life, and researches have suggested it was negatively associated with life satisfaction. However, age may moderate such an association. In the current study, participants aged 12 to 84 years ($N = 1598$) finished measures of present-fatalistic time perspective and satisfaction with life. Then moderation analysis was conducted to examine whether age would moderate the association between the present-fatalistic time perspective and life satisfaction. Results indicated that age played a moderating role in the association between the present-fatalistic time perspective and life satisfaction across the lifespan. Specifically, present-fatalistic time perspective and life satisfaction was negatively correlated in participants with younger and middle age, but not correlated in older participants. The limitations of this study and future directions are discussed.

Key Words: Time perspective; Present-fatalistic; Life satisfaction; Lifespan

1. Introduction

Life satisfaction, the cognitive component of subjective well-being (Diener, Emmons, Larsen, & Griffin, 1985), refers to an individual's assessment of his/her quality of life on the basis of his/her own unique set of criteria (Shin & Johnson, 1978). It was reported that participants with a higher level of life satisfaction have less emotional and behavioral problems (Suldo & Huebner, 2006). Life satisfaction has also been found to be related to locus of control. While people with high internal control experience greater current life satisfaction, those with high external control report lower current life satisfaction (Klonowicz, 2001).

Time perspective is defined as the “nonconscious process whereby the continual flows of personal and social experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events” (Zimbardo & Boyd, 1999, p.1271), and includes past-positive, past-negative, present-hedonistic, present-fatalistic, and future time perspectives. Present time perspective has been found to predict alcohol and illicit drug use (Chavarria, Allan, Moltisanti, & Taylor, 2015) and risky driving (Zimbardo, Keough, & Boyd, 1997), whereas future time perspective has been found to predict environmental engagement (Milfont, Wilson, & Diniz, 2012). Furthermore, past time perspective has been associated with social support (Holman & Zimbardo, 2009). Some researchers have reported that present-fatalistic time perspective is negatively correlated with happiness and subjective well-being (Stolarski, Matthews, Postek, Zimbardo, & Bitner, 2014).

Present-fatalistic time perspective has been argued to have the greatest negative

impact on an individual in that it is “a fatalistic, helpless, and hopeless attitude toward the future and life” (Zimbardo & Boyd, 1999, p.1275). Consistent with the view proposed by Zimbardo and Boyd (1999), an empirical study showed that the present-fatalistic time perspective was positively correlated with maladaptive psychological outcomes, such as negative affect and tense arousal (Stolarski et al., 2014). As for the relationship between present-fatalistic time perspective and life satisfaction, researchers have found that participants with higher present-fatalistic time perspective report lower levels of subjective well-being (J. W. Zhang, Howell, & Stolarski, 2013) and lower life satisfaction (J. W. Zhang & Howell, 2011). Sailer et al. (2014) found that present-fatalistic time perspective of young adults (mean age 29.74 years) was significantly negatively related to their past satisfaction with life, present satisfaction with life, and psychological well-being.

However, most of the previous studies on present-fatalistic time perspective have been conducted in young adults (Sailer et al., 2014; Stolarski et al., 2014; J. W. Zhang et al., 2013) and their results may not generalize to older adults. In fact, one study on the association between present-fatalistic time perspective and life satisfaction among the older adults, researchers did not replicate the finding that present-fatalistic time perspective was statistically negatively related to life satisfaction (Desmyter & De Raedt, 2012). As people age, they are increasingly limited by biological and societal life-course constraints (Hay & Diehl, 2010; Hunt, Wisocki, & Yanko, 2003; Schulz, Heckhausen, & Locher, 1991). For example, elderly people are more likely to suffer from chronic illness, functional losses and impairments. At the same time, the

shrinking of social and material resources experienced by elderly people creates societal constraints. However, despite these pressures, older people still generally report higher life satisfaction than those who are younger, a phenomenon known as the “satisfaction paradox” (Diener, Suh, Lucas, & Smith, 1999). The phenomenon may be due to the ability of older adults to keep a balance between primary and secondary control, which may be the key to psychological health while aging (Heckhausen & Schulz, 1995).

The life-span theory of control proposed a dual-process model in which it is suggested that people adapt their behavior to age-related changes in control striving (Heckhausen & Schulz, 1995; Rothbaum, Weisz, & Snyder, 1982). The dual-process model divides control into primary and secondary components. Primary control involves attempts to change the world to meet personal desires or needs while secondary control refers to bringing the self in line with environmental forces. Unlike primary control, secondary control helps people to accept adverse events and it may be more appropriate when the situation is filled with painful but irreversible events (Rothbaum et al., 1982). In view of the “satisfaction paradox”, it is possible that secondary control is more frequently used and more adaptive for older adults because of their decline in physical and psychological functioning. In fact, a cross-sectional study with adults aged 18 to 84 years supported this proposition, showing that secondary control increased with age, and was highest for the oldest participants (Peng, 1993). Further research has also indicated that compensatory secondary control strategies become more adaptive in late life (Chipperfield, Perry, & Menec, 1999).

Older adults who adopt secondary control strategies also tend to have more flexible goals and adjust them more frequently to cope with problems in daily life (Heckhausen & Schulz, 1995). The model of assimilative and accommodative coping proposes a dual-process framework to explain how individuals use coping strategies adaptively (Brandtstädter, 2009; Brandtstädter & Rothermund, 2002). In the assimilative mode, a person exerts efforts to modify the circumstances to fit in with his or her goals and in the accommodative mode, personal goals are adjusted to fit the current constraints and circumstances (Brandtstädter, 2009). The core distinction between the two modes is that assimilative activities seek to ‘solve’ a problem whereas accommodative processes aim to ‘dissolve’ a problem (Bailly, Gana, Hervé, Joulain, & Alaphilippe, 2014). The tenacious adherence to the goals help people to keep motivated to solve problems, but the potential advantage for a person to hold a assimilative mode may disappear and even lead to helplessness when there is a big gap between goals and personal capacities (Brandtstädter, 2009). In contrast, the accommodative mode facilitates individuals to adopt a flexible adjustment to the previous goal, thus helping them to revise it to a more appropriate goal. It has been reported that a greater tendency to adopt an accommodative flexibility mode than an assimilative tenacity mode is positively associated with advancing age (Niessen, Heinrichs, & Dorr, 2009; Piazza, Charles, & Almeida, 2007). Moreover, older adults with more flexible goal adjustment reported higher life satisfaction and lower depression (Bailly, Hervé, Joulain, & Alaphilippe, 2012; Heyl, Wahl, & Mollenkopf, 2007; Niessen et al., 2009). Based on these findings, it may be suggested that

adopting an accommodative mode is particularly important and advantageous for older adults.

Fatalism, similar to external control, is the belief that the outcome of events is beyond personal control and is predetermined by external forces, like fate and predestination (Straughan & Seow, 1998). People seeking secondary control often have an external locus of control, which means they are more likely to show a fatalistic attitude towards life (Rothbaum et al., 1982). Both secondary control and accommodative mode emphasize the importance of realizing the limitation of human beings and deriving meaning from uncontrollable experiences or aversive life changes so as to better understand and accept them (Averill, 1973; Brandtstädter, 2009).

Fatalism has special meaning in Chinese culture. To some extent, fatalism is ‘the very essence’ of Chinese mentality (Abbott, 1970), and has a profound influence in traditional Chinese culture. Fatalism in Chinese culture mainly originated from the thoughts of Confucianism, Buddhism and Taoism. They all advocated the acceptance for uncontrollable experiences or aversive life change as a wisdom (Ch'en, 1964; Cheng, Lo, & Chio, 2010; Palsane & Lam, 1996). Thus, the Chinese traditional philosophy rooted in fatalism denoted that the fatalism in China has a unique meaning thus it is valuable to study the association between fatalism and life satisfaction.

In view of the underlying construct of secondary control and accommodative mode, we may speculate that fatalism may be far less negative for older adults than younger people because the older are better at deriving meaning from uncontrollable experiences and to accept them. Namely, age may be an important moderating factor

in the association between life satisfaction and the present-fatalistic time perspective.

The Present Study

The present study mainly aimed to examine whether age moderate the association between life satisfaction and the present-fatalistic time perspective. In addition, we were interested in the development of life satisfaction and the present-fatalistic time perspective across the lifespan. Regarding that older adults are better at deriving meanings from uncontrollable experiences and accepting them, and it may make the present-fatalistic time perspective less negative for them, thus we hypothesized that the strength of the negative relationship between present-fatalistic time perspective and life satisfaction was stronger among those participants with young age and middle age as compared to those participants with older age.

2. Method

2.1. Participants and procedure

A total of 1598 individuals participated in this study. The participants were recruited from middle schools, universities, and communities in Beijing, Jiaozuo, and Wuhan in China. Several trained experimenters were recruited from different regions to distribute the questionnaires to primary and middle school students, undergraduates, postgraduates, and community residents. Participants completed the hard copy questionnaires individually. It took about 10-30 min to complete the questionnaires. Participants over 60 years were screened by the Chinese version of the Mini-Mental

State Examination (MMSE) to exclude cognitive disorders (Z.-Y. Wang, Zhang, Zhai, Chen, & Zhao, 1989). No participants reported a history of psychiatric illness, neurological illness, drug/alcohol abuse/dependence, or brain injury. All participants (745 males, 853 females) were aged between 12-84 years old ($M = 34.36$; $SD = 18.42$); the perceived economic condition was assessed by “How do you think about your current family economic condition?”. The average score in the study was 2.79 ($SD = 0.66$), with higher scores representing better perceived economic condition (range 1-5). The average education years were 11.14 ($SD = 3.97$) (range 0-20). Seven participants’ perceived economic condition data and 31 participants’ education years data were missing.

This study was approved by the ethics committee of the corresponding author's affiliation. Written informed consent was obtained from each participant before data collection. The participants were paid RMB 10 yuan for their participation.

2.2. Measures

2.2.1. Zimbardo Time Perspective Inventory (ZTPI)

Present-fatalistic time perspective was measured with the Chinese version of the Zimbardo Time Perspective Inventory (ZTPI) (Y. Wang, Chen, Cui, & Liu, 2015). The five-factor model of a 20-item short version of the ZTPI has shown good validity and reliability in a Chinese setting (Wang et al., 2015). Each time perspective was assessed with four items using a 5-point scale (1 = very untrue of me, 5 = very true of me). In the current study, we mainly adopted the present-fatalistic time perspective

subscale (e.g., “Since whatever will be, it doesn't really matter what I do”, “My life path is controlled by forces I cannot influence”). The internal consistency of the present-fatalistic time perspective subscale as measured by Cronbach’s alpha was .65 and the coefficient omega was .68 (Rammstedt & Beierlein, 2014).

2.2.2 Satisfaction With Life Scale (SWLS)

The Chinese version of the Satisfaction With Life Scale (SWLS) (Bai, Wu, Zheng, & Ren, 2011) was used to measure life satisfaction. The SWLS is a five item scale which has been widely used to measure participants’ global life satisfaction. Ratings were given on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The Cronbach’s alpha of this scale was .88 and the coefficient omega was .91 (Rammstedt & Beierlein, 2014).

2.3. Data analyses

Linear regression analyses were conducted separately to examine the developmental trend of the present-fatalistic time perspective and life satisfaction.

To test whether age play a moderating role in the association between the present-fatalistic time perspective and life satisfaction, the MODPROBE computational procedure based on the Johnson-Neyman technique was conducted to probe interactions (Hayes & Matthes, 2009). Namely, we performed an ordinary least square (OLS) regression model with life satisfaction as outcome variable, present-fatalistic time perspective as the focal predictor and age as the moderator. The focal predictor and moderator variable were all mean centered. In addition, to

visualize the statistically significant interaction, the simple slopes for the focal predictor at low (one SD below the mean), moderate (sample mean), and high (one SD above the mean) values of the moderator were also presented.

3. Results

In view that all the data were collected from self-reported scales, Harman's one-factor test was performed to test common method variance. The factor analysis on all items extracted three factors with eigen values greater than one. Moreover, no general factor was apparent in the unrotated factor structure, with the first factor accounting for less than 40% of the variance, which suggested the common method bias was not of a great concern.

Table 1 presents the descriptive statistics, the bivariate correlations for the key variables. Age was positively correlated with present-fatalistic time perspective ($r=.179, p<.01$) and life satisfaction ($r=.064, p<.05$), and present-fatalistic time perspective was negatively correlated with life satisfaction ($r=-.079, p<.01$).

Insert Table 1 Here

Two separate linear regression analyses indicated age positively predicted life satisfaction ($B=.002, SE=.008, p<.05$) and present-fatalistic time perspective ($B=.029, SE=.004, p<.001$).

Moderation analysis based on the Johnson-Neyman technique showed the combined effects of present-fatalistic time perspective and age on life satisfaction was

statistically significant ($B=.007$, $SE=.003$, $p=.040$, 95% CI $=.0003;.013$), and the interaction effect uniquely accounted for .26% of the variance in the model without controlling for any covariate variables ($F(1,1554) = 4.21$, $p<.05$). (See table 2). The weak interaction effect in the model was acceptable considering the effect size for moderation effect was usually small (Chaplin, 1991). Thus, our hypothesis that age played a moderating role in the association between the present-fatalistic time perspective and life satisfaction was supported.

Insert Table 2 Here

Specifically, as shown in Fig.1, the strength of the negative relationship between present-fatalistic time perspective and life satisfaction was stronger among those participants with younger age ($B = -.320$, $SE = .077$, $p<.001$, 95% CI $= -.470; -.170$) and middle age ($B = -.202$, $SE = .058$, $p<0.01$, 95% CI $= -.316; -.087$). However, such a negative association did not exist in the older age participants ($B = -.083$, $SE = .088$, $p=.3453$, 95% CI $= -.255; .089$). The regression model explained 1.6% of variance in life satisfaction. The interaction term uniquely predicted .7% of variance.

Insert Fig 1 Here

4. Discussion

In the current study, we found both the present-fatalistic time perspective and life satisfaction increased with age. As expected, age moderated the association between

life satisfaction and the present-fatalistic time perspective. Specifically, the strength of the negative relationship between present-fatalistic time perspective and life satisfaction was stronger among those participants with young and middle age as compared to those participants with older age.

To our knowledge, no study has explored the development of time perspective across such a wide lifespan, although a previous research has suggested that present-fatalistic time perspective might show differences with age (Siu, Lam, Le, & Przepiorka, 2014). One possible reason for the observed relationship between present-fatalistic time perspective and age is that people may often meet problems and setbacks as they mature and strive to establish their lives. Thus, as age increases, individuals will gradually form new attitudes toward life and the world, which make them feel that they have less control over the external world. As a result, their present-fatalistic time perspective increases.

Some studies indicated a “U” shape relationship between age and subjective well-being (Blanchflower & Oswald, 2004, 2008; Van Landeghem, 2012), while some researchers reported a weak positive linear association between age and subjective well-being (Hansson, Hillerås, & Forsell). Our result was consistent with the latter, which showed that life satisfaction increased with age across the lifespan ($r=.06$). Such a result may reflect that younger individuals have more unrealistic expectations while older individuals learn to adapt to their strengths and weaknesses (López Ulloa, Møller, & Sousa-Poza, 2013). For the lower life satisfaction of teenagers, it may be because they are in the identity-versus-role-confusion stage (Erikson, 1963), a period

filled with sharp conflicts in psychological, emotional and social aspects.

As hypothesized, age played a moderating role in the association between the present-fatalistic time perspective and life satisfaction. The young participants are in a life stage full of opportunities and challenges, which require them to keep a state of high spirit and confidence. However, the present-fatalistic time perspective in which there is a belief that the present is determined by fate and the future is predestined, resulted in people's sense of loss of control. These factors may make it difficult for them to cope with various challenges. Not surprisingly, such a pessimistic thinking style caused negative affect, such as lower hedonic tone, which is associated with well-being (Matthews, Jones, & Chamberlain, 1990).

However, with the normal decline in physical and mental functioning, older age adults usually lose primary control, and adopt more secondary control strategies to keep a balance in control (Schulz et al., 1991). For example, older age adults are reported to be more likely to choose accommodative coping (Niessen et al., 2009). They can reduce pains and losses from previous unrealizable goals by flexibly changing the goals (Bailly et al., 2014). Not only did older age adults change their goals flexibly, but also they show selectivity of goals (Heckhausen & Schulz, 1995). The socioemotional selectivity theory proposed that with a consideration of fewer opportunities and less time available to benefit from purely knowledge-related goals, the older adults usually prefer to pursue emotional goals rather than knowledge-related goals (Carstensen, Fung, & Charles, 2003). Indeed, the selection of social goals was beneficial for older adults to manage their well-being (Coudin &

Lima, 2011). Besides, older people might use emotion regulation more often when coping with difficulties. For example, older adults tend to adopt more emotional coping strategies (e.g., positive reappraisal, distancing) while younger people prefer to adopt problem focused coping strategies (e.g., seeking social support, planning for problem solving) (Folkman, Lazarus, Pimley, & Novacek, 1987; Hunt et al., 2003). In short, older people tend to prefer secondary control for which the underlying philosophy is the willingness to change one's goals to adapt the external world.

Fatalism is the belief that the outcome of events is predetermined by external forces and beyond personal control (Straughan & Seow, 1998), and it is more likely to result in negative psychological outcomes in the young who mainly rely on primary control. For the older adults, despite a sense of fatalism, they may still maintain high satisfaction during daily life. This might be because they realize their various limitations and are used to adopt secondary control strategies, and thus adapt to the external world.

The use of secondary control can facilitate people deriving meaning from uncontrollable experiences to better understand and accept them (Averill, 1973; Brandtstädter, 2009). Such a combination of interpretation and acceptance was viewed as a facet of wisdom (Ardelt, 1997). In fact, the wisdom and philosophical root of fatalism can easily be found in traditional Chinese culture. For example, Confucians encouraged people to learn a sense of transcendence, which is a consideration of something beyond oneself, others, and the world. Such a mental state may facilitate people to become open to any issue, thus avoiding fixation which was the prominent

cause of mental problems (Palsane & Lam, 1996). For Taoism, people are told to take no intervention in life, and form a sense of acceptance. Buddhism instructs people to embrace life as a whole, including the negative aspects, which ultimately will liberate themselves from pain or loss (Cheng et al., 2010). Moreover, just as Confucius said wisdom develops with age “..... At forty, I had no doubts; At fifty, I knew the orders of heaven; At sixty, my ears could receive anything with calm; At seventy, I could follow my heart, without judging what was right” (Y.-Y. Zhang, 2006), which denotes that older people are more likely to interpret and accept aversive accidents than younger people.

5. Limitations and further directions

There are some limitations in the current study. First, this cross-sectional study cannot rule out cohort effects, therefore, future research should take this effect into consideration. Second, the ways of control and coping was not measured in the current study, thus the reason for the negative relationship between present-fatalistic time perspective and life satisfaction could not be ascertained and need further study. Third, due to possible cultural differences in attitude and thinking, whether the observed relationship between present-fatalistic time perspective and life satisfaction in this study will be shown in other cultures needs to be evaluated.

6. Conclusions

This study showed that life satisfaction and present-fatalistic time perspective

increased with age. Moreover, we found that age played a moderating role in the association between the present-fatalistic time perspective and life satisfaction. The results may reflect that older adults are more prone to accept their limitations and life circumstances and more readily adopt secondary control strategies when compared to younger adults.

Conflict of interests

None.

References

- Abbott, K. A. (1970). *Harmony and individualism: Changing Chinese psychosocial functioning in Taipei and San Francisco*: Orient Cultural Service.
- Ardelt, M. (1997). Wisdom and Life Satisfaction in Old Age. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 52B(1), P15-P27. doi: 10.1093/geronb/52B.1.P15
- Averill, J. R. (1973). Personal control over aversive stimuli and its relationship to stress. *Psychological Bulletin*, 80(4), 286-303. doi: 10.1037/h0034845
- Bai, X., Wu, C., Zheng, R., & Ren, X. (2011). The Psychometric Evaluation of the Satisfaction with Life Scale Using a Nationally Representative Sample of China. *Journal of Happiness Studies*, 12(2), 183-197. doi: 10.1007/s10902-010-9186-x
- Bailly, N., Gana, K., Hervé, C., Joulain, M., & Alaphilippe, D. (2014). Does flexible goal adjustment predict life satisfaction in older adults? A six-year longitudinal study. *Aging & Mental Health*, 18(5), 662-670. doi: 10.1080/13607863.2013.875121
- Bailly, N., Hervé, C., Joulain, M., & Alaphilippe, D. (2012). Validation of the French version of Brandtstädter and Renner's Tenacious Goal Pursuit (TGP) and Flexible Goal Adjustment (FGA) scales. *Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology*, 62(1), 29-35. doi: 10.1016/j.erap.2011.09.005
- Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics*, 88(7-8), 1359-1386. doi: 10.1016/S0047-2727(02)00168-8
- Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science & Medicine*, 66(8), 1733-1749. doi: 10.1016/j.socscimed.2008.01.030
- Brandtstädter, J. (2009). Goal pursuit and goal adjustment: Self-regulation and intentional self-development in changing developmental contexts. *Advances in Life Course Research*, 14(1-2), 52-62. doi: 10.1016/j.alcr.2009.03.002
- Brandtstädter, J., & Rothermund, K. (2002). The Life-Course Dynamics of Goal Pursuit and Goal

- Adjustment: A Two-Process Framework. *Developmental Review*, 22(1), 117-150. doi: 10.1006/drev.2001.0539
- Carstensen, L., Fung, H., & Charles, S. (2003). Socioemotional Selectivity Theory and the Regulation of Emotion in the Second Half of Life. *Motivation and Emotion*, 27(2), 103-123. doi: 10.1023/A:1024569803230
- Ch'en, K. K. (1964). *Buddhism in China: A historical survey* (Vol. 1972). Princeton, NJ: Princeton University Press.
- Chaplin, W. F. (1991). The next generation of moderator research in personality psychology. *Journal of personality*, 59(2), 143-178.
- Chavarria, J., Allan, N. P., Moltisanti, A., & Taylor, J. (2015). The effects of Present Hedonistic Time Perspective and Past Negative Time Perspective on substance use consequences. *Drug and Alcohol Dependence*, 152, 39-46. doi: 10.1016/j.drugalcdep.2015.04.027
- Cheng, C., Lo, B. C. Y., & Chio, J. H. M. (2010). The Tao (way) of Chinese coping. In M. H. E. Bond (Ed.), *The Oxford handbook of Chinese psychology* (pp. 399-419). New York: Oxford University Press.
- Chipperfield, J. G., Perry, R. P., & Menec, V. H. (1999). Primary and Secondary Control-Enhancing Strategies: Implications for Health in Later Life. *Journal of Aging and Health*, 11(4), 517-539. doi: 10.1177/089826439901100403
- Coudin, G., & Lima, M. L. (2011). Being well as time goes by: Future time perspective and well-being. *International Journal of Psychology and Psychological Therapy*, 11(2), 219-232.
- Desmyter, F., & De Raedt, R. (2012). THE RELATIONSHIP BETWEEN TIME PERSPECTIVE AND SUBJECTIVE WELL-BEING OF OLDER ADULTS. *Psychologica Belgica*, 52(1), 19-38.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, 49(1), 71-75. doi: 10.1207/s15327752jpa4901_13
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125(2), 276-302. doi: 10.1037/0033-2909.125.2.276
- Erikson, E. H. (1963). *Childhood and society* (Rev. ed.). New York: Norton.
- Folkman, S., Lazarus, R. S., Pimley, S., & Novacek, J. (1987). Age differences in stress and coping processes. *Psychology and Aging*, 2(2), 171-184. doi: 10.1037/0882-7974.2.2.171
- Hansson, A., Hillerås, P., & Forsell, Y. Well-Being in an Adult Swedish Population. *Social Indicators Research*, 74(2), 313-325. doi: 10.1007/s11205-004-6168-6
- Hay, E. L., & Diehl, M. (2010). Reactivity to daily stressors in adulthood: The importance of stressor type in characterizing risk factors. *Psychology and Aging*, 25(1), 118-131. doi: 10.1037/a0018747
- Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior research methods*, 41(3), 924-936.
- Heckhausen, J., & Schulz, R. (1995). A life-span theory of control. *Psychological Review*, 102(2), 284-304. doi: 10.1037/0033-295X.102.2.284
- Heyl, V., Wahl, H.-W., & Mollenkopf, H. (2007). Affective Well-Being in Old Age. *European Psychologist*, 12(2), 119-129. doi: 10.1027/1016-9040.12.2.119
- Holman, E. A., & Zimbardo, P. G. (2009). The social language of time: The time perspective–social network connection. *Basic and Applied Social Psychology*, 31(2), 136-147. doi: 10.1080/01973530902880415

- Hunt, S., Wisocki, P., & Yanko, J. (2003). Worry and use of coping strategies among older and younger adults. *Journal of Anxiety Disorders*, 17(5), 547-560. doi: 10.1016/S0887-6185(02)00229-3
- Klonowicz, T. (2001). Discontented people: reactivity and locus of control as determinants of subjective well-being. *European Journal of Personality*, 15(1), 29-47. doi: 10.1002/per.387
- López Ulloa, B., Møller, V., & Sousa-Poza, A. (2013). How does subjective well-being evolve with age? A literature review. *Journal of Population Ageing*, 6(3), 227-246. doi: 10.1007/s12062-013-9085-0
- Matthews, G., Jones, D. M., & Chamberlain, A. G. (1990). Refining the measurement of mood: The UWIST Mood Adjective Checklist. *British Journal of Psychology*, 81, 17-42.
- Milfont, T. L., Wilson, J., & Diniz, P. (2012). Time perspective and environmental engagement: A meta-analysis. *International Journal of Psychology*, 47(5), 325-334. doi: 10.1080/00207594.2011.647029
- Niessen, C., Heinrichs, N., & Dorr, S. (2009). Pursuit and adjustment of goals during unemployment: The role of age. *International Journal of Stress Management*, 16(2), 102-123. doi: 10.1037/a0015683
- Palsane, M. N., & Lam, D. J. (1996). Stress and coping from traditional Indian and Chinese perspectives. *Psychology & Developing Societies*, 8(1), 29-53.
- Peng, Y. (1993). *Primary and secondary control in American and Chinese-American adults: Cross-cultural and life-span developmental perspectives*. (doctor doctoral dissertation), Brandeis University, Waltham, MA.
- Piazza, J. R., Charles, S. T., & Almeida, D. M. (2007). Living With Chronic Health Conditions: Age Differences in Affective Well-Being. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 62(6), P313-P321.
- Rammstedt, B., & Beierlein, C. (2014). Can't We Make It Any Shorter?: The Limits of Personality Assessment and Ways to Overcome Them. *Journal of Individual Differences*, 35(4), 212-220. doi: 10.1027/1614-0001/a000141
- Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology*, 42(1), 5-37. doi: 10.1037/0022-3514.42.1.5
- Sailer, U., Rosenberg, P., Nima, A. A., Gamble, A., Gärling, T., Archer, T., & Garcia, D. (2014). A happier and less sinister past, a more hedonistic and less fatalistic present and a more structured future: time perspective and well-being. *PeerJ*, 2, 1-18. doi: 10.7717/peerj.303
- Schulz, R., Heckhausen, J., & Locher, J. L. (1991). Adult Development, Control, and Adaptive Functioning. *Journal of Social Issues*, 47(4), 177-196. doi: 10.1111/j.1540-4560.1991.tb01841.x
- Shin, D. C., & Johnson, D. M. (1978). Avowed happiness as an overall assessment of the quality of life. *Social Indicators Research*, 5(1-4), 475-492. doi: 10.1007/BF00352944
- Siu, N. Y. F., Lam, H. H. Y., Le, J. J. Y., & Przepiorka, A. M. (2014). Time perception and time perspective differences between adolescents and adults. *Acta Psychologica*, 151, 222-229. doi: 10.1016/j.actpsy.2014.06.013
- Stolarski, M., Matthews, G., Postek, S., Zimbardo, P. G., & Bitner, J. (2014). How we feel is a matter of time: relationships between time perspectives and mood. *Journal of Happiness Studies*, 15(4), 809-827. doi: 10.1007/s10902-013-9450-y
- Straughan, P., & Seow, A. (1998). Fatalism reconceptualized: A concept to predict health screening

- behavior. *Journal of Gender, Culture and Health*, 3(2), 85-100. doi: 10.1023/A:1023278230797
- Suldo, S., & Huebner, E. S. (2006). Is extremely high life satisfaction during adolescence advantageous? *Social Indicators Research*, 78(2), 179-203. doi: 10.1007/s11205-005-8208-2
- Van Landeghem, B. (2012). A test for the convexity of human well-being over the life cycle: Longitudinal evidence from a 20-year panel. *Journal of Economic Behavior & Organization*, 81(2), 571-582. doi: 10.1016/j.jebo.2011.08.001
- Wang, Y., Chen, X.-J., Cui, J.-f., & Liu, L.-l. (2015). Testing the Zimbardo Time Perspective Inventory in the Chinese context. *PsyCh Journal*, 4(3), 166-175. doi: 10.1002/pchj.103
- Wang, Z.-Y., Zhang, M.-Y., Zhai, G.-Y., Chen, J.-X., & Zhao, J. (1989). The application of Chinese Mini Mental State Examination (MMSE). *Shanghai Archives of Psychiatry*, 7(3), 108-111.
- Zhang, J. W., Howell, R., & Stolarski, M. (2013). Comparing three methods to measure a balanced time perspective: The relationship between a balanced time perspective and subjective well-being. *Journal of Happiness Studies*, 14(1), 169-184. doi: 10.1007/s10902-012-9322-x
- Zhang, J. W., & Howell, R. T. (2011). Do time perspectives predict unique variance in life satisfaction beyond personality traits? *Personality and Individual Differences*, 50(8), 1261-1266. doi: 10.1016/j.paid.2011.02.021
- Zhang, Y.-Y. (2006). *Chinese Classics: The Analects of Confucius*. Beijing: Zhonghua Book Company.
- Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, 77(6), 1271-1288. doi: 10.1037/0022-3514.77.6.1271
- Zimbardo, P. G., Keough, K. A., & Boyd, J. N. (1997). Present time perspective as a predictor of risky driving. *Personality and Individual Differences*, 23(6), 1007-1023. doi: 10.1016/S0191-8869(97)00113-X

Table 1 Means, standard deviations, and interrelations of the study variables

Variable	M	SD	Range	1	2	3
1.Age	34.36	18.42	12-84	-		
2.PF	10.74	2.71	4-20	.197**	-	
3.LS	21.04	6.19	5-35	.064*	-.079**	-

Note: N=1598. PF= present-fatalistic time perspective, LS=life satisfaction. * $P<0.05$,

** $P<0.01$.

Table 2 OLS regression estimating indicators of life satisfaction from age ,
present-fatalistic time perspective and their interaction

	<i>B</i>	<i>SE</i>	<i>b</i>	<i>t</i>
FP(F)	-.202	.059	-.088	-3.452***
Age(M)	.026	.009	.077	3.011***
F×M	.007	.003	.052	2.051*

Note: PF= present-fatalistic time perspective. The focal predictor (F), moderator (M) were mean centered prior to the analyses. Unstandardized (B) and standardized (b) regression coefficients are reported. * $P < 0.05$, *** $P < 0.001$.

Fig. 1. Interaction between age and present-fatalistic time perspective on life satisfaction.

Note: PF= present-fatalistic time perspective. Age values are the sample mean and +/- one SD from the mean.