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BRIEF REPORT

Time Perspective and All-Cause Mortality: Evidence From the English Longitudinal Study of Ageing

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Abstract

Background Long-term future thinking has been associated with a range of favorable health behaviors. However, it is currently unclear whether this translates into an effect on morbidity and mortality.

Purpose The goal of this study was to study the relationship between time perspective and all-cause mortality and to examine the role of health behavior in explaining this association.

Methods Participants (N = 9,949) aged 50 and over from the English Longitudinal Study of Ageing, a representative cohort of older English adults, estimated the length of their time horizon for financial planning (time perspective). Two thousand ninety-two deaths were recorded over a 9-year follow-up period (2002/2003–2012). Smoking, physical activity, and alcohol consumption were examined as factors that may underlie the time perspective–mortality link.

Results Our prospective survival analyses showed that those who tend to plan for longer periods experienced a significantly reduced risk of all-cause mortality (HR = 0.83; 95% confidence interval [CI]: [0.80, 0.87], p < .001 per 1 SD increase in future time perspective). This association remained after adjusting for baseline socioeconomic status and health (HR = 0.92; 95% CI: [0.88, 0.97], p < .001). The link between time perspective and mortality was observed across the gradient of financial circumstances and did not appear to be due to reverse causality. Healthy behavior among the more future orientated explained 34% of the link between time perspective and mortality.

Conclusions Using a simply administered indicator of time perspective, this study suggests that a future-orientated time perspective may be an important predictor of reduced risk of death.

Keywords Time perspective • Time preference • Health • Mortality • Smoking • Physical activity

People differ markedly in their attitude toward the future and the extent to which they are influenced by past, present, or future concerns. Long-term thinkers tend to value the future and reflect on the enduring costs and benefits of their present-day decision making. Orienting toward the future may yield health gains by shifting behavior away from immediately rewarding but potentially harmful behavior, and toward behavior with valued future health benefits. In line with this idea, future-orientated individuals have been shown to invest more immediate effort in health-promoting behaviors such as engaging in physical activity and eating healthy foods [1]. They also make more short-term sacrifices in gratification, for example, avoiding high-calorie foods and practicing safe sex [1, 2]. In contrast, those motivated more by the present report engaging in unhealthy behavior including frequent alcohol consumption, smoking, and drug use [3, 4]. As such, the empirical evidence supports the intuition that those with a far future time perspective, who habitually attend to the long-term consequences of their actions, are more likely to perform health protective behaviors and avoid health risk behaviors.

Indeed, the idea that future time perspective may be conducive to a healthy lifestyle has been examined in

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a rapidly growing set of research studies spanning psychology and economics [1, 5–7] that draw on a range of related constructs (e.g., time-discounting, delay of gratification, consideration of future consequences) and corresponding measures (e.g., delay discounting monetary choice tasks, financial planning horizon measures, multi-item psychometric scales) which have been shown to overlap empirically [8, 9]. However, despite this expanding evidence base, few empirical studies have moved beyond behavior to model the downstream health implications of how individuals orient toward and value the future. Although there is some evidence linking present-orientated preferences to health markers such as body mass index [5] and raised blood pressure levels [9], the prospective data needed to link time perspective to morbidity and mortality has been lacking.

In a notable exception, a study of over 11,000 adolescents found that those who preferred a larger (hypothetical) reward available after a delay over a smaller, immediate reward were marginally more likely to be alive at age 50 [10]. This study provided the first suggestive evidence that those who make well-documented trade-offs between immediate pleasure and long-run health benefits may go on to live longer lives. It is likely that the relatively small effect of such time perspective–related choices evident at age 50 may manifest more clearly in older age when the long-run health effects of modifiable behavioral risk factors tend to emerge [11]. Furthermore, older individuals are presented with difficult choices such as whether to change their health behavior in response to medical diagnoses and how intensively to engage in arduous chronic illness management with delayed health benefits. Future orientated older adults may tend to bear such small repeated costs to stave off future health decline and potentially extend their lives.

To test this idea, we examined a large population representative sample of English adults aged 50 years and over. Specifically, we tested the link between future time perspective and all-cause mortality over a 9-year period. To assess time perspective, we utilized a measure of one's financial planning horizon for saving and expenditure (ranging from planning day to day or less to planning over 10 years ahead) that has been used as an indicator of future time perspective in studies in both health psychology and health economics [8, 12, 13]. Those with a more future-orientated time horizon on this measure have been shown to be at reduced risk of tobacco use, to experience greater success in quitting smoking, and to be more likely to undergo cancer screening [12, 13]. A further related aim of the current research was to examine whether health behavior may underpin a potential association between time perspective and mortality. We reasoned that those who value future outcomes more would tend to smoke less, be more physically active, and consume alcohol less frequently, and that these behaviors would explain why this group may live longer.

Methods

Participants

This study uses data from the English Longitudinal Study of Ageing (ELSA), an ongoing, prospective cohort study established in 2002 to study the health of older, community-dwelling men and women in England. The ELSA sample was recruited from adults who participated in one of three waves of the Health Survey for England (1998, 1999, and 2001), a cross-sectional survey based on a stratified random sample of English households. Our baseline sample is those recruited during the first phase of ELSA data collection in 2002–2003 when 11,391 core members aged 50 and over were surveyed. Participants provided informed consent to take part in ELSA, and ethical approval was obtained from the London Multicentre Research Ethics Committee. Those included in the current analyses (N = 9,949) provided consent to link to death information, had available survival time data, completed the time perspective measure, and had complete baseline sociodemographic and health condition variables. Sample characteristics are detailed in Table 1, and the sources of missing data are detailed in Figure S1 and Table S1 in the Supplementary Materials (Section 1).

Measures

Time perspective

Our measure of future time perspective was based on a question included in the "Expectations" module of Wave 1 of ELSA where participants detailed their planning horizon for saving and expenditure. Participants were asked: "In planning your/your family's saving and spending, which of the following time periods is more important to you and your husband/wife/partner?" Participants then selected between six response options presented on a show card: *the next few weeks, the next few months, the next year, the next few years, the next 5–10 years, and longer than 10 years*. Those who spontaneously reported that they plan from day to day or do not plan were categorized as having the shortest planning horizon (see Table 1 for descriptives). Responses to this question have been shown to correlate with other markers of time perspective such as the Consideration of Future Consequences Scale (CFCS: r = 0.33) [8].

Mortality

Vital status data for consenting study members were ascertained through linkage to the UK National Health

Table 1 Participants' characteristics at baseline (N = 9,949)

Characteristic	Statistic
Time perspective (continuous)	M = 4.10 (SD = 1.78)
1 = Day-to-day or less (%)	10.96
2 = Next few weeks (%)	12.13
3 = Next few months (%)	12.85
4 = Next year (%)	15.38
5 = Next few years (%)	23.56
6 = Next 5–10 years (%)	18.69
7 = Longer than 10 years (%)	6.44
Age (years)	M = 64.88 (SD = 10.50)
Sex (% female)	54.15
Childhood socioeconomic status[a]	M = 2.50 (SD = 1.14)
Education[b]	M = 4.86 (SD = 2.22)
Income (deciles)	M = 5.62 (SD = 2.86)
Wealth (deciles)	M = 5.55 (SD = 2.85)
Financial difficulties[c]	M = 2.11 (SD = 0.99)
Angina (%)	9.59
Heart attack (%)	5.78
Stroke (%)	4.10
Hypertension (%)	38.15
Diabetes (%)	7.22
Cancer (%)	6.31
Arthritis (%)	32.67
Chronic lung disease (%)	6.61
Difficulties with activities of daily living (%)	27.96
Depressive symptoms	M = 1.57 (SD = 1.98)

[a]Derived from father's occupation and ranked from 1 = managerial/professional to 4 = other/insecure employment. [b]Education rated from 1 = Higher Diploma/Certificate, Degree or equivalent or above to 7 = no qualification. [c]Rated from 1 = managing very well to 6 = have severe financial difficulties.

Service's Central Registry held by the Office of National Statistics. It is a legal requirement to register deaths within 5 days in England/Wales/Northern Ireland and 8 days in Scotland so those not registered were assumed to be still alive. The 9-year follow-up period ran from the date of the baseline household survey (2002–2003) to March 2012. From the 9,949 participants in the baseline analytical sample, 2,092 deaths were identified through linkage to central mortality records over the follow-up period.

Covariates

Age and sex were adjusted for in all models. Fully adjusted models included five indicators of life-course socioeconomic status: childhood social class assessed using the occupation of the participant's father or main carer (classified into *managerial/professional*, *intermediate, routine,* and *other/insecure employment*), highest educational qualification (1 = *higher diploma/certificate, degree or equivalent or above* to 7 = *no qualifications*), and current equivalized benefit unit household income and net wealth (both adjusted to account for household size and converted to deciles to remove skewness). We also controlled for current financial difficulties. Participants indicated how "you/you and your husband/wife/partner are getting along financially these days?" (rated from 1 = *manage very well* to 6 = *have severe financial difficulties*). In addition, participants reported whether they had received a diagnosis from a physician of angina, heart attack (including myocardial infarction or thrombosis), stroke, hypertension, diabetes, cancer, arthritis, and chronic lung disease such as bronchitis or emphysema. We also included a binary indicator of the presence of any difficulties in self-care and the ability to carry out instrumental activities of daily living. Depressive symptoms were measured using the eight-item Center for Epidemiological Studies Depression Scale (internal reliability: Cronbach's α = .80) [14]. In supplementary analyses, we adjusted for objectively recorded body mass index (kg/m^2) as this variable was assessed in separate nurse assessment waves (see Supplementary Materials).

In additional analyses, we examined lifestyle factors that could explain a potential link between time perspective and mortality: smoking status (yes/no), frequency of alcohol consumption in the past year (from 1 = *twice a day or more* to 6 = *not at all*), and three items assessing the frequency of engagement in mild, moderate, and vigorous sports or other physical activity respectively (from 1 = *more than once a week* to 4 = *hardly ever, or never*) were combined and reverse-scored to form a single activity scale (reliability: α = .59).

Analyses

All analyses were conducted in Stata 13, and ELSA Wave 1 sample weights were applied to account for nonresponse. In survival analyses, the time-to-event variable was calculated using the month/year of the Wave 1 survey as a starting point and the censoring date marking the end of the follow-up period was March 2012 with deceased participants censored during the year of death. Cox proportional hazards regression models were used to assess the mortality risk associated with time perspective. Hazard ratios with 95% confidence intervals (CIs) were calculated to identify the increased risk associated with (i) time perspective treated as a continuous standardized variable and (ii) each ordered category of time perspective (i.e., planning beyond the next 10 years/the next 5–10 years/few years/next year/next few months/next few weeks) relative to those who tend to plan from day-to-day or less (reference category). Treating the time perspective measure as continuous (vs. categorical) did not affect goodness of fit substantially as indexed by the Bayesian information criterion (BIC) (age, sex adjusted

model: continuous = 35,445, categorical = 35,479; including all covariates: continuous = 35,171, categorical = 35,201) or Akaike information criterion (AIC) level (age, sex adjusted model: continuous = 35,424, categorical = 35,422; including all covariates: continuous = 35,041, categorical = 35,035) suggesting that the relationship between this measure and mortality can be modeled as linear without substantial loss of information. Preliminary analyses showed that there was no evidence that the time perspective–mortality link was modified by sex, so data for both men and women were pooled. We first ran an age- and sex-adjusted model followed by a model adjusting for an extensive set of socioeconomic and baseline health variables.

To examine the possibility of reverse causation, we removed deaths occurring in the first 2 years after the baseline survey (left-censoring) and adjusted our models for participant longevity expectations (chance of reaching the next 5-year age-band rated from 0 to 100). We also conducted a planned sensitivity test to ascertain whether the predicted association between time perspective and mortality was focused centrally among those in less affluent financial circumstances (which may lead to both short-term planning and premature death). To do this, we examined the interaction between time perspective and financial circumstances (i.e., household income, current financial difficulties) in predicting all-cause mortality and tested whether financial planning and mortality were associated at low (−1 *SD*) and high (+1 *SD*) levels of income, wealth, and financial difficulties. Finally, we tested whether a potential relation between time perspective and mortality could be accounted for by three lifestyle factors: smoking, alcohol consumption, and physical activity.

Results

The baseline characteristics of the study participants are shown in Table 1. The average age of the sample was 64.9 (*SD* = 10.5) and 54.2% of the sample were female. There was substantial heterogeneity in responses to the future time perspective question with 23.1% of participants reporting planning on a weekly basis or less and 25.1% planning over periods of 5 years or longer.

Age- and sex-adjusted Cox regression models showed that those who planned their saving/spending over longer periods were at reduced risk of all-cause mortality (*HR* = 0.83, 95% CI: [0.80, 0.87], $p < .001$ per 1 *SD* increase in future time perspective). In natural metrics, which may facilitate the interpretation of our point estimates, a 1 *SD* increase from mean time perspective levels equated to a change from planning for the "next year" to planning for the "next 5–10 years" and a 1 *SD* decrease in time perspective translated approximately to a change from planning over the "next year" to planning for the "next few weeks." This association remained after controlling for a broad set of socioeconomic and baseline health measures (*HR* = 0.92, 95% CI: [0.88, 0.97], $p < .001$), as shown in Table 2. An examination of the individual time perspective categories showed that those who tended to plan for periods longer than a few weeks were at reduced risk of mortality with those who plan more than 10 years ahead at considerably reduced risk. In age- and sex-adjusted analyses, planning for periods of 10 or more years was associated with a decrease of 48% in the risk of death (*HR* = 0.52, 95% CI: [0.39, 0.69], $p < .001$) and 32% reduced risk in a fully adjusted model (*HR* = 0.68, 95% CI: [0.51, 0.91], $p < .01$). Further adjustment for body mass index did not attenuate the study results as shown in the Supplementary Table S2 (Section 2).

There was little evidence that excluding deaths occurring in the 2 years after baseline (left-censoring: *HR* = 0.92, 95% CI: [0.87, 0.97], $p < .01$ per 1 *SD* increase in future time perspective) or further adjustment for longevity expectations (*HR* = 0.93, 95% CI: [0.88, 0.98], $p < .01$) substantially affected the magnitude of the associations observed. Furthermore, we did not find evidence of a statistically significant interaction between the time perspective measure and either household income (*HR* = 0.96, 95% CI: [0.91, 1.01]), wealth (*HR* = 1.00, 95% CI: [0.96, 1.05]), or reported financial difficulties (*HR* = 1.02, 95% CI: [0.97, 1.07]). An examination of the simple slopes revealed similar associations on average between time perspective (*z*-score) and mortality among those in more or less deprived financial circumstances as indicated by low (−1 *SD*) and high (+1 *SD*) income (−1 *SD*: *HR* = 0.95, 95% CI: [0.89, 1.00], $p < .1$; +1 *SD*: *HR* = 0.87, 95% CI: [0.80, 0.94], $p < .001$), low and high wealth (−1 *SD*: *HR* = 0.92, 95% CI: [0.87, 0.98], $p < .01$; +1 *SD*: *HR* = 0.92, 95% CI: [0.86, 1.00], $p < .05$), and low and high levels of current financial difficulties (−1 *SD*: *HR* = 0.91, 95% CI: [0.85, 0.97], $p < .01$; +1 *SD*: *HR* = 0.94, 95% CI: [0.87, 1.00], $p < .1$).

Role of Health Behavior

In a fully adjusted model, participants who planned their saving/spending over longer periods had a reduced likelihood of smoking (*OR* = 0.91, 95% CI: [0.86, 0.97], $p < .01$ per 1 *SD* increase in time perspective) and reported less frequent alcohol intake ($\beta = -0.04$, *SE* = 0.01, $p < .001$) and higher levels of physical activity ($\beta = 0.068$, *SE* = 0.01, $p < .001$) than more present-orientated participants. Controlling for health behavior attenuated the association between time perspective and all-cause mortality by 34%, as shown in Table 2. We used the Stata *khb* procedure to decompose the relative contribution of smoking, alcohol consumption, and physical activity to the odds of

Table 2 Hazard ratios for the association of higher future time perspective scores with all-cause mortality rates, English Longitudinal Study of Ageing (2002/2003–2012; N = 9,949)

	Age/sex		+Covariates[a]		+Health behavior	
	HR	95% CI	HR	95% CI	HR	95% CI
Future time perspective[b]	0.83***	0.80, 0.87	0.92***	0.88, 0.97	0.95*	0.90, 1.00
Smoker					1.72***	1.53, 1.95
Physical activity[b]					0.81***	0.77, 0.85
Alcohol consumption[b]					1.01	0.97, 1.06
	Age/Sex		+ Covariates[a]		+Health behavior	
	HR	95% CI	HR	95% CI	HR	95% CI
Future time perspective category						
Next few weeks	1.06	0.92, 1.24	0.94	0.81, 1.10	0.98	0.84, 1.14
Next few months	0.74***	0.63, 0.86	0.71***	0.60, 0.83	0.78**	0.66, 0.91
Next year	0.77***	0.67, 0.90	0.85*	0.73, 0.99	0.93	0.80, 1.08
Next few years	0.70***	0.61, 0.80	0.83**	0.72, 0.95	0.89	0.77, 1.03
Next 5–10 years	0.63***	0.54, 0.75	0.79**	0.66, 0.94	0.85	0.71, 1.02
Longer than 10 years	0.52***	0.39, 0.69	0.68**	0.51, 0.91	0.74*	0.55, 1.00
Smoker					1.72***	1.52, 1.94
Physical activity[b]					0.81***	0.77, 0.85
Alcohol intake[b]					1.01	0.97, 1.06

N = 9,949 for all models. Top panel examines time perspective as a continuous variable and bottom panel as a categorical indicator (reference category is planning from day-to-day or less). Each regression step includes control variables from previous regression. [a]Covariates include socioeconomic status and financial circumstances gauged using five indicators: childhood social class, educational attainment, household income, net household wealth and financial difficulties, and baseline health assessed using eight binary chronic illness indicators, and measures capturing difficulties in conducting the activities of daily living, and depressive symptoms. [b]Variable is standardized (M = 0, SD = 1).

*p < .05, **p < .01, ***p < .001.

dying over the 9-year period [15]. This analysis identified statistically significant indirect effects of physical activity and smoking (both p < .01) that explained 21% and 13% of the link between time perspective and mortality, respectively.

Discussion

In the first population representative study of the prospective link between adult time perspective and all-cause mortality, we found that older English adults with a more future-orientated perspective at baseline tended to live longer over a 9-year follow-up period. This finding remained strong after adjustment for factors which may shape both future planning and longevity including life-span socioeconomic status and a range of baseline health indicators. In particular, compared with the most present-orientated participants, those who reported planning for periods longer than a few weeks appeared to be at reduced risk of early death with those who plan for periods of over 10 years showing the lowest probability of premature mortality. These findings provide initial evidence of a graded relation whereby future time perspective is associated with reduced risk of mortality in a dose-response pattern.

Our results also complement existing evidence of the role of future orientation in fostering a range of favorable health behaviors. In fully controlled analyses, future time perspective was associated with avoiding smoking, drinking alcohol infrequently, and engaging in regular sports and exercise. These results were consistent with our prediction that health behavior may play a key role in explaining the time perspective–longevity link. Indeed, the study findings suggested that among older English adults, smoking and physical activity could partly account for the potential life-lengthening contribution of future time perspective. On average, tobacco use explained 13% of the relation between future orientation and all-cause mortality while physical activity explained 21%.

These findings align well with previous evidence suggesting that a future time perspective consistently predicts a reduced risk of smoking and successful cessation [4, 6, 12] and increased physical activity [1]. Although our measure

of alcohol intake was inversely associated with future time perspective as anticipated, it was unrelated to mortality which may reflect the focus of the measure on capturing the general frequency of drinking rather than the total volume of alcohol consumed. Our results also suggest that there are likely to be other important behavioral pathways not examined in this study that could explain the time perspective–longevity link. For example, present orientation has been shown to predict unsafe driving [16], interpersonal aggression [7], use of illicit drugs [4], and risky sexual behavior [2] which contribute significantly to premature mortality [11]. Conversely, future-orientated individuals are more likely to take preventive action for future health gain in numerous additional ways including engaging with screening and vaccination programs and illness management [7, 13], eating a healthy diet [1], and limiting their sun exposure [17]. Furthermore, because future orientation forecasts educational attainment, lifetime income [10], and savings, it is likely that economic success may act as a pathway from time perspective to mortality. In this study, we treated socioeconomic indicators as confounding variables rather than potential mediating channels which may have represented an overadjustment. However, we considered this necessary given time perspective was assessed in the financial domain.

Specifically, the time perspective measure employed in the current study focused on the length of one's time horizon for future financial planning. An advantage of this approach is that the measure is outside of the domain of health and as such unlikely to be simply acting as a proxy for either initial health beliefs or behavior. However, we cannot rule out the possibility of a domain-specific effect whereby the protective role of financial aspects of time perspective does not generalize to nonfinancial measures or broader conceptualizations of time perspective. Prior evidence does partially mitigate this possibility: The time perspective indicator utilized forecasts behavior in the health domain [8, 12, 13] and correlates with other time perspective markers including future-orientated choices on a delay discounting task [8], and measures assessing the general future consequences of one's current actions [7, 8] and orientation toward the future [4, 8]. Furthermore, our sensitivity analyses suggested that the benefits of a future time perspective were present across the gradient of financial circumstances, supporting the potential broad relevance of the measure employed. This noted, future work incorporating additional time perspective indicators is needed to definitively test whether the relation observed in this study generalizes across time perspective domains and measurement instruments.

An additional concern is the possibility of reverse causation whereby poor health may reduce the length of one's planning horizon, thus explaining the relation between time perspective and longevity. We took several steps to mitigate this possibility. First, we showed that the link between future time perspective and mortality could not be attributed to a host of physician-diagnosed conditions. Second, we found that our results are not sensitive to left-censoring (removing deaths in the 2-year post-baseline period) which considered the influence of undetected health problems. Third, we found that adjustment for longevity expectations had very little impact on the association between time perspective and mortality.

Finally, even small differences in near-term time horizon, which did not appear to be an effect of serious illness, were associated with different patterns of longevity: Planning months ahead was associated with a reduced risk of mortality compared with planning from day-to-day. This finding is notable because it suggests that our findings are not driven exclusively by the health protective effects of far future planning, and also because it points to a present-orientated group that may gain from interventions that aim to promote future-thinking [18].

In conclusion, the current research provides initial evidence that future time perspective may contribute to all-cause mortality and that this association may in part be explained by tobacco use and physical activity. Our study sets the stage for future studies exploring the behavioral mediators linking measures of time perspective to subsequent morbidity and mortality.

Supplementary Material

Supplementary material is available at *Annals of Behavioral Medicine* online.

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Compliance with Ethical Standards

Authors' Statement of Conflict of Interest and Adherence to Ethical Standards The authors declare no conflict of interest.

Ethical Approval Ethical approval was obtained from the London Multicentre Research Ethics Committee.

Informed Consent: This study draws on secondary data collected as part of the national English Longitudinal Study of Ageing (ELSA). Participants provided informed consent to take part in ELSA.

References

1. Sweeney AM, Culcea I. Does a future-oriented temporal perspective relate to body mass index, eating, and exercise? A meta-analysis. *Appetite*. 2017;112:272–285.

2. Rothspan S, Read SJ. Present versus future time perspective and HIV risk among heterosexual college students. *Health Psychol*. 1996;15:131–134.
3. Adams J, Nettle D. Time perspective, personality and smoking, body mass, and physical activity: An empirical study. *Br J Health Psychol*. 2009;14:83–105.
4. Keough KA, Zimbardo PG, Boyd JN. Who's smoking, drinking, and using drugs? Time perspective as a predictor of substance use. *Basic Appl Soc Psych*. 1999;21:149–164.
5. Barlow P, Reeves A, McKee M, Galea G, Stuckler D. Unhealthy diets, obesity and time discounting: A systematic literature review and network analysis. *Obes Rev*. 2016;17:810–819.
6. Barlow P, McKee M, Reeves A, Galea G, Stuckler D. Time-discounting and tobacco smoking: A systematic review and network analysis. *Int J Epidemiol*. 2017;46:860–869.
7. Joireman J, King S. Individual differences in the consideration of future and (more) immediate consequences: A review and directions for future research. *Soc Personal Psychol Compass*. 2016;10:313–326.
8. Adams J, Nettle D. Time perspective, personality and smoking, body mass, and physical activity: An empirical study. *Br J Health Psychol*. 2009;14:83–105.
9. Daly M, Harmon CP, Delaney L. Psychological and biological foundations of time preference. *J Eur Econ Assoc*. 2009;7:659–669.
10. Golsteyn BH, Grönqvist H, Lindahl L. Adolescent time preferences predict lifetime outcomes. *Econ J*. 2014;124:F739–F761.
11. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States, 2000. *JAMA*. 2004;291:1238–1245.
12. Adams J. The role of time perspective in smoking cessation amongst older English adults. *Health Psychol*. 2009;28:529–534.
13. Picone G, Sloan F, Taylor D. Effects of risk and time preference and expected longevity on demand for medical tests. *J Risk Uncertain*. 2004;28:39–53.
14. Turvey CL, Wallace RB, Herzog R. A revised CES-D measure of depressive symptoms and a DSM-based measure of major depressive episodes in the elderly. *Int Psychogeriatr*. 1999;11:139–148.
15. Kohler U, Karlson KB, Holm A. Comparing coefficients of nested nonlinear probability models. *Stata J*. 2011;11:420–438.
16. Zimbardo PG, Keough KA, Boyd JN. Present time perspective as a predictor of risky driving. *Pers Individ Dif*. 1997;23:1007–1023.
17. Heckman CJ, Wilson DB, Ingersoll KS. The influence of appearance, health, and future orientations on tanning behavior. *Am J Health Behav*. 2009;33:238–243.
18. Hall PA, Fong GT, Sansone G. Time perspective as a predictor of healthy behaviors and disease-mediating states. In Stolarski M, Fieulaine N, van Beek W, eds. *Time Perspective Theory; Review, Research and Application*. Switzerland: Springer; 2015:339–352.