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AN INVESTIGATION OF TIME PREFERENCES, LIFE EXPECTANCY AND ANNUITY VERSUS LUMP-SUM CHOICES – CAN SMOKING HARM LONG-TERM SAVING DECISIONS?

SEMINAR ON AGING, RETIREMENT AND PENSIONS: TRENDS, CHALLENGES AND POLICY

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Smoking and Long Term Savings

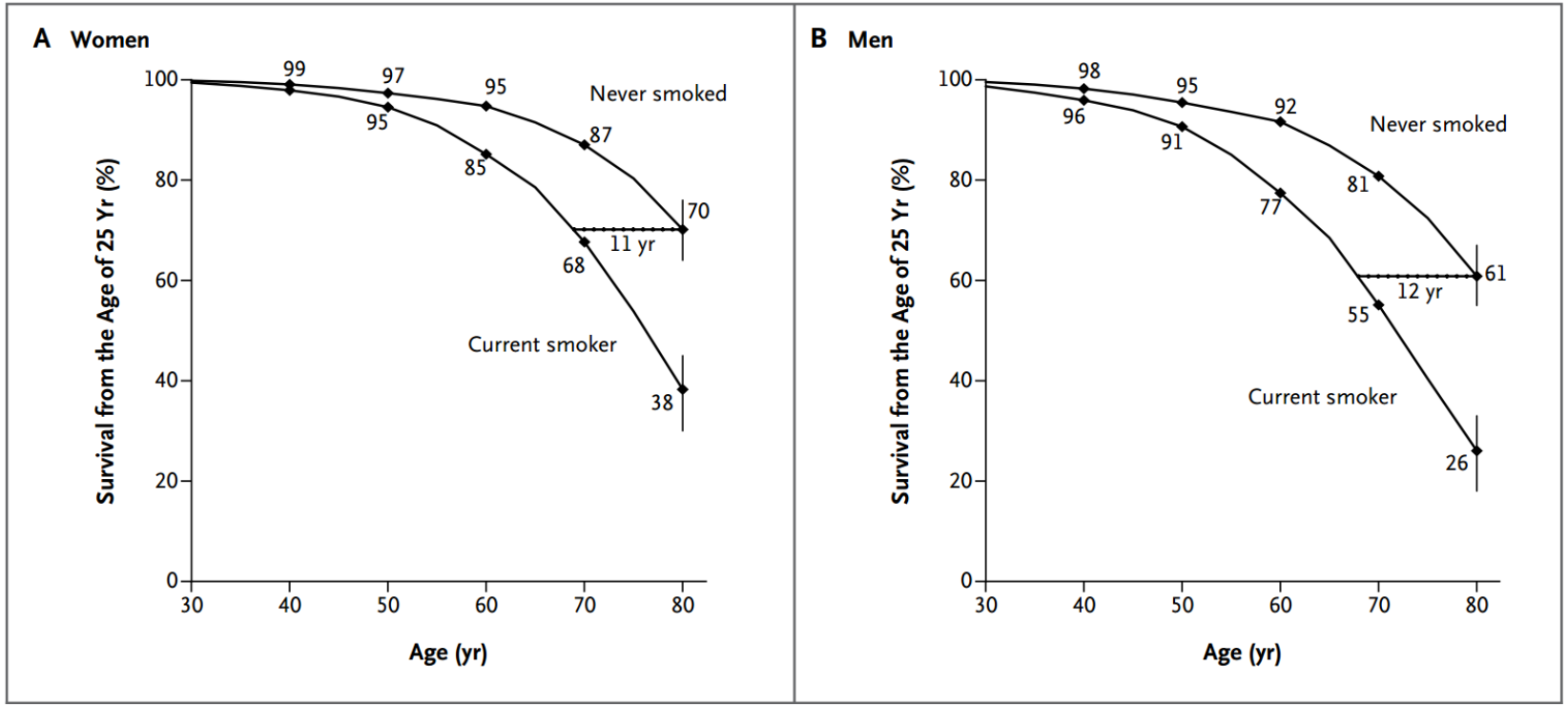
- Our project relates and contributes to the literature of time preference, life expectancy, smoking, and long term savings decisions.
- We investigate the possibility of different time preferences of smokers in the context of long term savings.
- Our investigation relies on unique proprietary data from an insurance corporation in Israel.
- We suggest that smokers experience self-illusion regarding their own life expectancy.

Why is it Interesting?

- Smoking is considered to be the most significant preventable risk to human health, (Wang (2014)).
- Smoking is responsible for 20% of total mortality in the US since the 1990s, (Mokdad, Marks, Stroup and Gerberding (2004)).
- One should ask:
  - Why do people smoke?
  - Do smokers have different characteristics?
  - What is the relation between smoking and financial decisions? – long term savings decisions

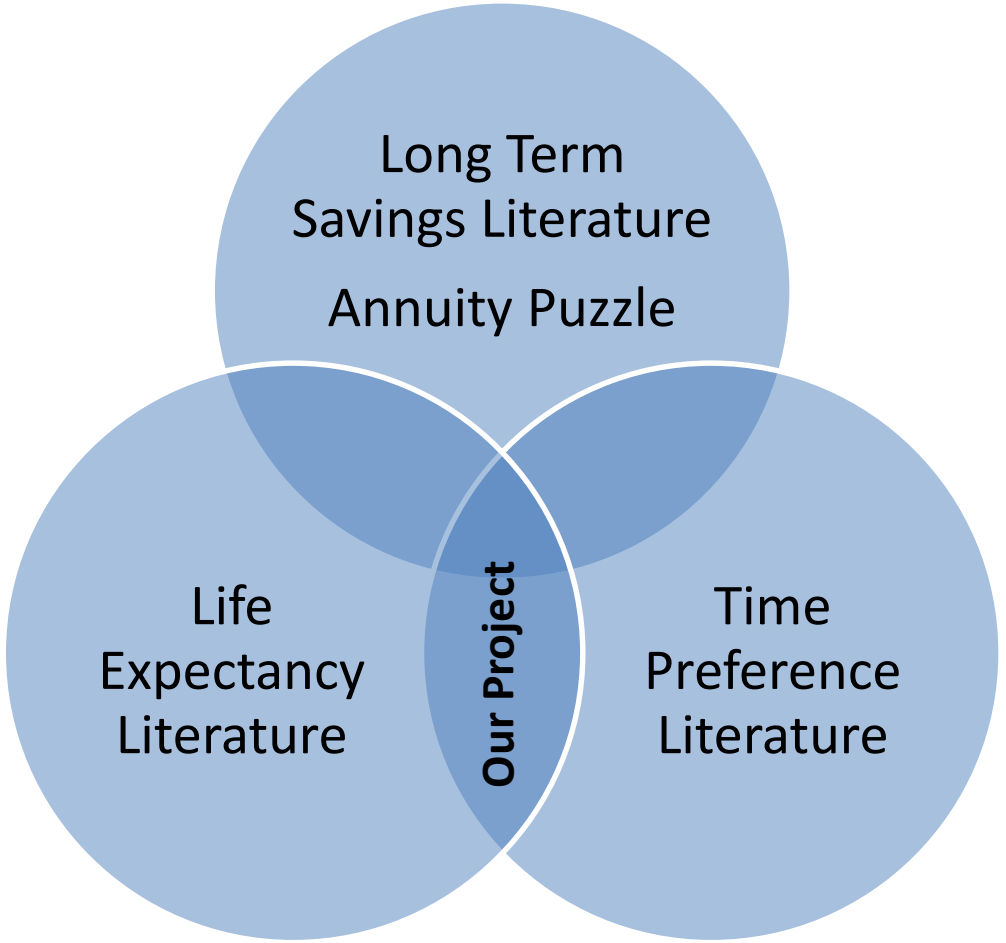
- **We exploit a special feature of pension insurance policies in Israel as an interesting test case for smokers' financial decisions.**

Smokers Life Expectancy



Jha, Prabhat, et al. "21st-century hazards of smoking and benefits of cessation in the United States." *New England Journal of Medicine* 368.4 (2013): 341-350.

Academic Literature



Theory of Smoking and Time preferences

- One explanation for smoking is that it **could be explained by differences in time preference** (e.g. Becker and Murphy (1988), Lipkus, Barefoot, Williams and Siegler (1994), Daugherty and Brase (2010)). Specifically by, **present preferences** reflected in higher subjective discount rates.

- Smoking is used as a proxy for present preferences (Munasinghe and Sicherman (2006), Huston and Finke (2003) and Scharff and Viscusi, (2011)).

- Ongoing academic debate regarding the exact relationship between smoking and time preference (e.g Fuchs (1982), Adams and Nettle (2009) and Harrison, Lau, and Rutström (2010)).

The Annuity Puzzle

- Concerns that are related to time preference and individual choices are also related to long term saving decisions.
- One of the long standing puzzles with regard to long term saving choices is the “Annuity Puzzle”.
- An annuity is a monthly pension payment. It will generally be paid, as long as the retiree lives.
- Annuity is considered as an insurance against longevity risk.
- However, empirical work finds little evidence of the purchase of annuities (Benartzi, Previtero, and Thaler (2011)).

Our Settings
Pension Products in Israel

Pension Products

Pension funds

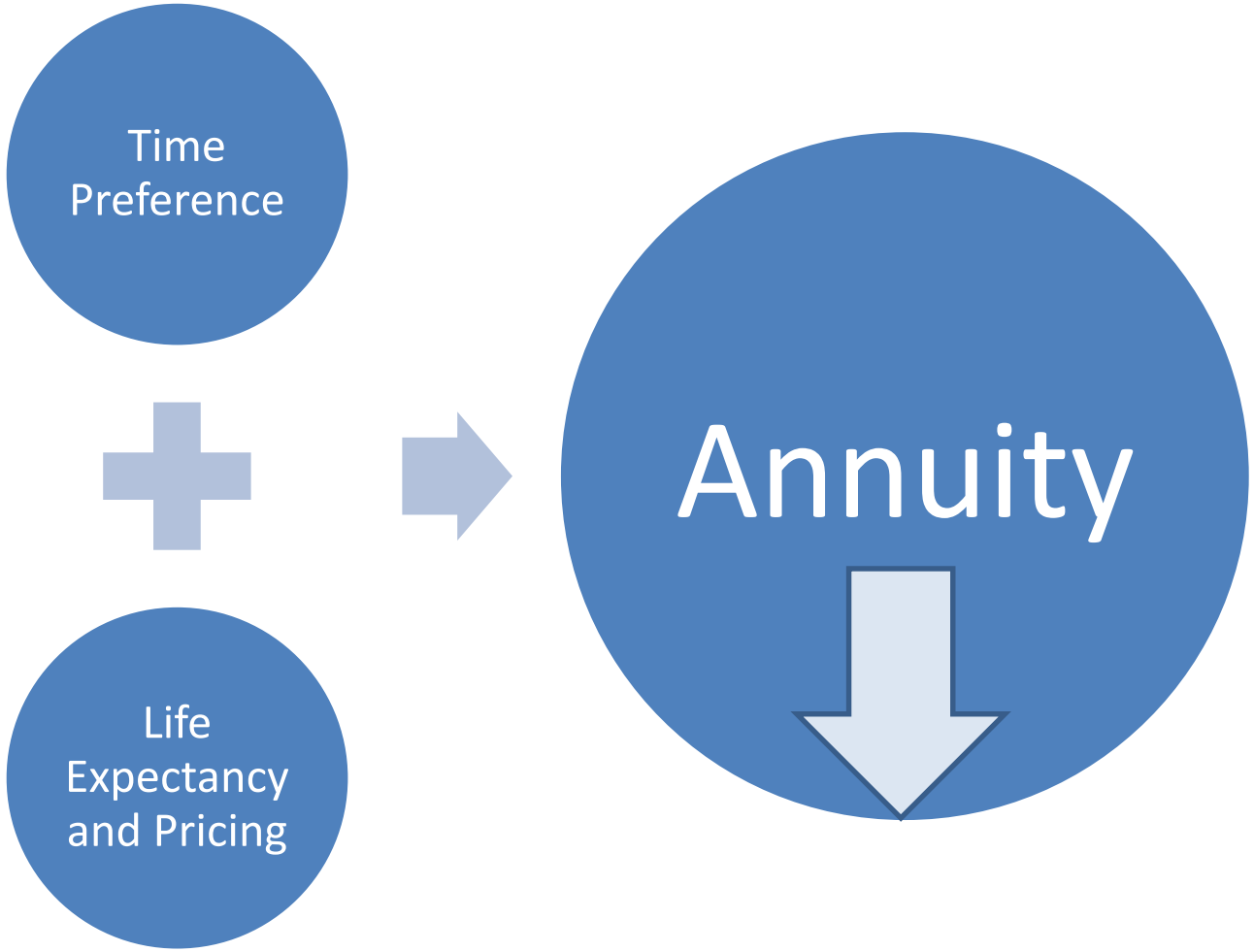
Provident Funds

Pension Insurance Policies

Pricing

- Gender
- Actuarial life expectancy
- Expected rate of return
- Medical Condition ✖

Theory of Smoking and Annuities



Data

- Our investigation relies on unique proprietary data from an insurance corporation in Israel.
- The data covers the decision of 18,860 retirees between the years 2009-2013.
- The data includes 1,556 retirees with accumulations above 500K NIS.

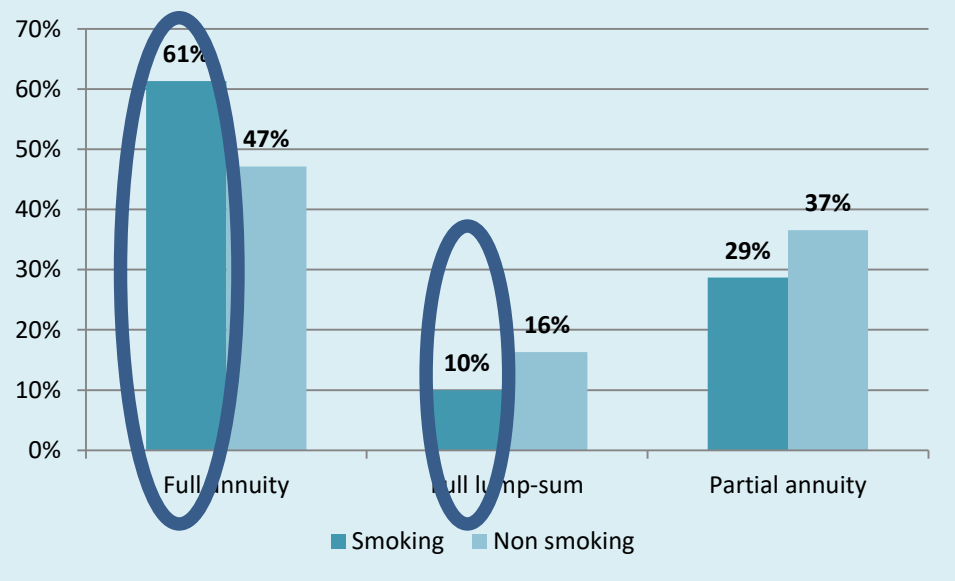
Descriptive Statistics

VARIABLES	(1) N	(2) Mean / %
Retirement age	1,556	67.2
Male	1,151	73.97%
Marital status		
Divorced	150	9.64%
Widower	75	4.82%
Married	1,175	75.51%
Smoking activity		
Smoker	150	9.64%

* Client with accumulation of over 500K NIS.

Smokers Prefer Annuities

- 61% of smokers chose full annuities, where only 47% of non-smokers chose this option.



* Clients with accumulation of over 500K NIS.

Smoking and Medical Condition

$$y_{ann} = \alpha + \beta_1 male + \beta_2 retirement\_age + \beta_3 year\_dummies + \beta_4 total\_amount + \beta_5 divorced + \beta_6 widoer + \beta_7 married + \beta_8 single + \beta_9 purcahse\_age + \beta_{10} no\_of\_policies + \beta_{11} percent\_post\_2008 + \beta_{12} smoker + \beta_{13} mortality\_increase + \beta_{14} professional\_increase + \epsilon_i$$

Personal characteristics

Policy characteristics

Smoking

Insurance increases

Smoking and Medical Condition

	Medical status regression with year FE (including smoking)			
	(1)	(2)	(3)	(4)
Variables	Probit coefficient	Marginal effects at mean	Logit coefficient	Marginal effects at mean
Gender	-0.179	-0.0297	-0.321	-0.0227
	(0.136)	(0.124)	(0.262)	(0.337)
Retirement age	-0.00181	-0.000301	-0.00235	-0.000166
	(0.0179)	(0.00323)	(0.0324)	(0.00336)
Total amount	7.68e-08	1.28e-08	1.11e-07	7.86e-09
	(7.21e-08)	(5.38e-08)	(1.23e-07)	(1.17e-07)
Divorced	-3.956	-0.658	-13.88	-0.979
	(120.5)	(17.35)	(680.5)	(33.47)
Widower	-3.969	-0.661	-13.95	-0.984
	(120.5)	(17.34)	(680.5)	(33.40)
Married	-3.917	-0.652	-13.84	-0.977
	(120.5)	(17.38)	(680.5)	(33.51)
Un-known marital status	-5.494	-0.914	-16.54	-1.167
	(120.5)	(16.30)	(680.5)	(30.68)
Purchase age	-0.0776***	-0.0129	-0.140***	-0.00985
	(0.0128)	(0.0530)	(0.0237)	(0.146)
No of policies	0.00754	0.00126	0.0295	0.00208
	(0.0140)	(0.00566)	(0.0293)	(0.0310)
Percent post 2008	2.515***	0.418	4.514***	0.318
	(0.469)	(1.719)	(0.873)	(4.729)
year2009	0.716***	0.119	1.378***	0.0972
	(0.199)	(0.490)	(0.381)	(1.444)
year2010	0.131	0.0219	0.247	0.0174
	(0.160)	(0.0936)	(0.290)	(0.259)
year2011	-0.00360	-0.000599	0.0440	0.00311
	(0.143)	(0.0239)	(0.261)	(0.0497)
year2012	0.0975	0.0162	0.202	0.0142
	(0.144)	(0.0707)	(0.267)	(0.212)
Smoker	0.173	0.0288	0.306	0.0216
	(0.172)	(0.122)	(0.329)	(0.321)
Mortality increase	-0.835**	-0.139	-1.450**	-0.102
	(0.338)	(0.573)	(0.577)	(1.520)
Professional increase	-0.254	-0.0422	-0.517	-0.0364
	(0.248)	(0.178)	(0.434)	(0.542)
Constant	9.780		24.19	
	(120.5)		(680.5)	
Observations	1,359	1,359	1,359	1,359
Pseudo R^2	0.2569	0.2569	0.2563	0.2563

Main Results

- Mortality extensions coefficients are negative and significant.
- Being in the group required to pay extra for the risk insurance reduces the probability to annuitize by 14%
- **Smoking does not have a negative significant effect on the demand for annuity.**

Optimism About the Consequences of Smoking Activity on Health and Life Expectancy – a Survey

- To investigate life expectancy perception by individuals in Israel, during March 2015, we obtained the results of an online survey of 1000 Israeli residents who were 50-70 years old.

- Our survey consisted of questions related to life expectancy estimations, demographic questions, long term savings decision choices and self-health assessment.

Survey Design – Life Expectancy Perception

- *In your opinion, what is the current life expectancy in Israel (each respondent for their own gender)?*

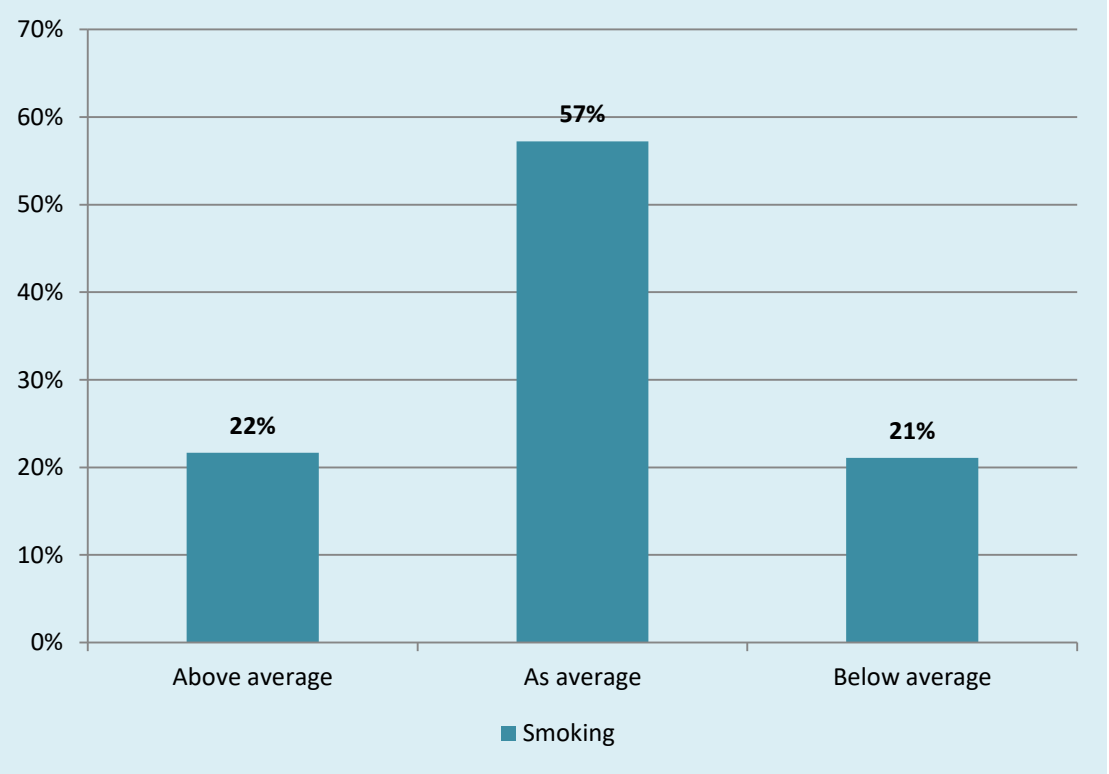
- *Do you expect your own life expectancy to be lower, identical or higher than the average life expectancy you have mentioned above?*

Survey Data

- 963 respondents.
- Average age – 58.
- 40.1% male.
- 73.4% married.
- 17.4% smoking.

Main Results

- 57% of smokers believe that they will live as average.
- 22% of smokers believe that they will live more than average.
- Median and mean of smokers responses are to live as average.
- The results hold for different robustness tests.



Life and Health Perception in the Survey

Smoking is not significantly related to health perception or self-life expectancy

	Health perception		Life perception	
	(1)	(2)	(3)	(4)
Variables	Ordered probit coefficient	Ordered logit coefficient	Ordered probit coefficient	Ordered logit coefficient
Age	0.0188**	0.0336**	0.00169	0.00277
	(0.00814)	(0.0141)	(0.00793)	(0.0135)
Kids	-0.0210	-0.0386	-0.00692	-0.0218
	(0.0273)	(0.0480)	(0.0267)	(0.0452)
Male	0.0933	0.159	0.227***	0.385***
	(0.0813)	(0.141)	(0.0792)	(0.136)
Single	0.892*	1.555**	-0.0534	-0.261
	(0.458)	(0.771)	(0.405)	(0.717)
Married	0.798*	1.399*	0.176	0.207
	(0.427)	(0.715)	(0.372)	(0.655)
Divorced	0.671	1.178	-0.152	-0.365
	(0.434)	(0.728)	(0.380)	(0.668)
Widower	0.971**	1.710**	0.326	0.377
	(0.475)	(0.795)	(0.424)	(0.737)
Smoking	0.162	0.276	-0.130	-0.228
	(0.109)	(0.189)	(0.297)	(0.500)
Past smoking	0.0198	0.0354	-0.132	-0.220
	(0.0899)	(0.157)	(0.0867)	(0.149)
High school education	-0.609	-1.144	-6.276	-16.34
	(0.804)	(2.071)	(93.14)	(639.4)
High education	-0.825	-1.542	-6.071	-15.98
	(0.802)	(2.069)	(93.14)	(639.4)
Unknown education	-0.778	-1.387	-5.941	-15.66
	(0.887)	(2.178)	(93.14)	(639.4)
Extreme sport activities	-0.0700	-0.0604	-0.0699	-0.161
	(0.199)	(0.348)	(0.190)	(0.323)
Age of father death	-0.00200	-0.00400*	0.000248	0.000679
	(0.00129)	(0.00225)	(0.00124)	(0.00213)
Age of mother death	0.00130	0.00251	-0.000735	-0.00103
	(0.00116)	(0.00202)	(0.00112)	(0.00193)
High income	-0.291***	-0.497***	0.0342	0.0599
	(0.0834)	(0.145)	(0.0810)	(0.139)
Health perception			-0.504***	-0.881***
			(0.0656)	(0.115)
Health perception and smoking (Interaction)			-0.169	-0.300
			(0.153)	(0.260)
Physical problems	1.379***	2.434***		
	(0.0899)	(0.172)		
Constant cut1	0.965	1.599	-8.079	-19.56
	(1.038)	(2.356)	(93.14)	(639.4)
Constant cut2	3.077***	5.271**	-6.385	-16.68
	(1.044)	(2.367)	(93.14)	(639.4)
Constant cut3	4.252***	7.602***		
	(1.045)	(2.369)		
Observations	955	955	955	955
Pseudo R^2	0.1714	0.1680	0.0781	0.0785

Main Results

- Non-smokers correctly estimate their life expectancy to be higher than the population.
- On average we expect that smokers, if they are rational, will estimate that they will live less than the life expectancy of the general population.
- Nevertheless smokers, on average, believe their life expectancy to be the same as the average in the population.

Self-control awareness

- Sophisticated people as the ones that are fully aware of issues related to their self-control, and naïve people as those that are fully unaware of their self-control problems, O'Donoghue and Rabin (1999).

- If smokers are at least partially aware of problems with their self-control, they may use different mechanisms, including annuities, to overcome their temptation to spend too much of their cash on hand from the lump-sum payment.

Self-control awareness

- If smokers use annuities to overcome their self-control problems we should observe them using other mechanisms as well.
- 75.77% of non-smokers purchased income protection insurance, but only 52.67% of smokers did.
- Our survey results suggest there is no significant difference between smokers and non-smokers in rates of consulting objective advisors.

Conclusions

- In contrast to theory, in our sample ,we do not find evidence that smokers prefer the present, as they do not choose the lump-sum option when retiring.

- Our conjecture to our findings is that smokers do not perceive themselves as having a shorter horizon, meaning that smokers experience self-illusions regarding their life expectancy, or that they are aware of their self control problems.

- We find support to the life-illusion conjecture with a survey that investigated life expectancy perceptions. We do not find evidence in the administrative data or in the survey responses to support the control of temptation conjecture.

Q&A