A note on long-term saving decisions when people worry too much about old age

Serge Mace*

Abstract: Many psychological studies have showed that people underestimate during most of their life their ability to adapt to the adverse consequences of old age, declining health and beauty in particular. This paper explores in a simple two-period model (young/old) the implications for long-term saving decisions of this misprediction considered as a projection bias in the spirit of Loewenstein, O’Donoghue and Rabin (2003). Under standard and general assumptions, we show that people oversave when health deterioration increases the marginal utility of consumption and undersave in the opposite case. Since it changes both the equilibrium level and the optimal saving level in the same direction, uncertainty about the future health level does not affect qualitatively the previous results. However, mispredicting adaptation amplifies the effect that uncertainty has on saving. If the individual is cross-prudent in the sense of Eeckhoedt, Rey and Schlesinger (2007) in particular, he will increase his saving all the more that he underestimates his ability to adapt.

Key words: Adaptation, saving, aging

JEL Classification: A12 – D11 - E21

1. INTRODUCTION

There exist many objective reasons to fear old age: declining beauty, diminishing physical aptitudes or cognitive functions and an increasing probability of illnesses or widowhood. However, old age is not as tragic as people think at first. There is an “old age paradox”: Old people are indeed happier than expected, and even often happier than younger people if we except the very last years. Besides the increase in financial satisfaction and leisure time for retired people, the main reason comes from the fact that people adapt to a certain extent to old age as well to most other good or bad events that happen in their life. And adaptation occurs by various ways. Psychological studies like Carstensen et al. (1999) showed that older people tend to reassess their priorities in favour of immediate satisfying activities instead of pursuing long-term goals. They also seem to become little by little better at regulating emotions. They are less often sad or angry, their negative emotions are shorter, and they tend to focus their attention to positive information, confirming the common-sense idea that wisdom comes with age.

* Institut Catholique de Lille, Faculté Libre de Sciences Economiques et de gestion - LEM CNRS UMR 8179. Contact: serge.mace@icl-lille.fr . tel : 00 33 3 20 13 41 01. Institut Catholique de Lille, 41 rue du Port, 59 016 Lille Cedex (France).

1 Among recent studies, Afsa and Marcus (2008) showed that, after ruling out the possibility of a pure cohort effect, happiness of French is U-shape with a minimum in midlife and a peak after 65. Blanchflower and Oswald (2007) also found this U-curve of happiness through the life cycle for Americans and Europeans, but only after controlling for income. Controlling for more factors like marital status, children, work status in particular, and excluding simple cohort effect again, Yang Yang (2008) found an increasing path this time for Americans.


3 Charles, Mather and Carstensen (2003) and Fung and Carstensen (2003) established these facts experimentally.
People however typically underestimate during most of their life the extent to which they will adapt to old age. This is why happiness at old age is viewed as a paradox. In a recent study in which self-reported happiness of younger and older adults are compared with their estimates of happiness, Lacey, Smith and Ubel (2006) showed for instance that despite that older adults were happier, younger adults almost systematically believe that happiness decreases with age (from 30 to 70), though less when they think about themselves than when they think about others. False beliefs about old age have been actually studied for more than three decades now in “ageism studies” and they are still very pregnant in European or American culture today.

From an economic point of view, since adaptation to old age and its misprediction modify people’s intertemporal preferences through their life cycle, it should affect their long-term savings plans. The objective of this paper is to identify clearly in a small two-period models (young/old) the consequences for long-term saving of the difficulty for people to correctly predict the evolution of their preferences by considering it as a projection bias in the spirit of Loewenstein, O’Donoghue and Rabin (2003). Given that very few things are known about the timing of adaptation and virtually nothing about the evolution of people’s ability to predict it correctly, a two-period model is not a bad start to organize the thinking. Even in this simple framework however, the conclusions are not straightforward at first. If people underestimate their future adaptation to a declining health, will they save more or less? What does it depend from? And how uncertainty about their future health levels affects their saving then?

Part II describes the formalism used to introduce simply both adaptation to old age and the difficulty for individuals to predict it correctly. Part III discusses the consequences of this imperfect prediction on long-term saving decisions. Under standard and general assumptions, we show that when they view their future health level as given, this bias leads individuals to undersave if the cross partial derivative of the utility function between health and consumption is positive and oversave otherwise. Uncertainty about the future health level does not affect qualitatively the previous results. However, mispredicting adaptation amplifies the effect that uncertainty has on saving. If the individual is cross-prudent in the sense of Eeckhoudt, Rey and Schlesinger (2007) in particular, he will increase his saving all the more that he underestimates his ability to adapt.

2. PREFERENCES

2.1. Utility function

Suppose the individual’s utility at period \( t \) (with \( t = 0,1 \), \( u_t \), is given by:

\[
 u_t = u(c_t, h_t)
\]

where \( c_t \) is the consumption at the period \( t \) and \( h_t \) the « health » capital of the individual for the same period. More exactly, \( h \) must be understood here as a « youth capital » defined as a synthetic indicator of cognitive and physical aptitudes, beauty and health that are sooner or later inversely related to the biological age. It could be viewed as a health capital in a broad sense (both terms will be considered as synonymous in the following). When individuals are young, they possess more of

---

4 This cognitive bias is extremely general again. Gilbert et al (1998) showed for instance that individuals underestimate their capacity to adapt to an electoral defeat, the failure to get a tenure at university and even a romantic breakup. See also Eastwick et al. (2007) on this last point. When it is related to health, it then affects medical decisions (Ubel et alii, 2005, Lacey et al., 2006, Walsh and Ayton, 2009).
5 See in particular Palmore (1998, 2005)
6 We take up here the assumptions made in a companion paper which focuses only on health investment.
this youth capital in the sense that they have more physical aptitudes, they are prettier or thinner, they are generally on average in better health, and this brings them by itself more satisfaction. With this definition, and because the reasoning is made with a typical individual, whatever the efforts he makes to “stay young”, that is to preserve his health/youth, he will end up with less health when old ($h_{t} < h_{0}$). The utility function has standard properties: $u_{c}$ is null when either $c$ or $h$ are null; $u_{c} > 0$, $u_{h} > 0$, $u_{c} < 0$, $u_{ch} < 0$ and the utility function is concave.

2.2. Adaptation and its underestimation

If the individual adapts at least partially to a declining “health”, the individual should draw more utility from a given level of health after adaptation. Furthermore, the marginal utility of health after adaptation should be lower than what would be observed with stable preferences. Having more physical abilities, a lower probability of being ill, looking prettier is always a good thing, but it is reasonable to assume that it is less important if people adapt. Instead of modifying the utility function, we assume that because of adaptation, all happens as if the subjective level of health (or perceived age), noted $h_{t}^\alpha$ does not decrease as fast as his objective level $h_{t}$ (biological age).

Specifically, we adopt the following simplified linear simplification:

$$h_{t}^\alpha = h_{i} + \alpha(h_{0} - h_{i})$$

$h_{0}$ is the individual’s exogenous level of health at period 0 (youth) and $\alpha \in [0,1]$ is the degree of adaptation. When $\alpha = 0$, no adaptation occurs and $h_{t}^\alpha = h_{i}$. In the extreme case of a perfect adaptation ($\alpha = 1$), the deterioration of health capital has no effect on the subjective perception of the individual so that $h_{t}^\alpha = h_{0}$. In the intermediate normal case ($0 < \alpha < 1$), $h_{t}^\alpha > h_{i}$ and the previous double assumption about adaptation is satisfied.

The second core assumption of the model is that young people underestimate their ability to adapt to old age. In the spirit of Loewenstein, O’Donoghue, Rabin [2003], young people make a *projection bias* in the sense that the prediction of their future preferences is biased by their present ones. As a consequence, the utility predicted in the first period for the second one and for a given level of health $h_{1}$ is lower than the one that will be observed. Contrary to the authors however, this bias is not formalized by a deformation of the utility function but, building upon the previous formalism, by assuming that the individual forecasts only a part $(1 - m) \in [0,1]$ of his degree of adaptation $\alpha$. The *predicted* health level for $t=1$, written $\hat{h}_{1}$, is then given by:

$$\hat{h}_{1} = h_{i} + \alpha_{m}(h_{0} - h_{i}) \quad \text{where} \quad \alpha_{m} = \alpha(1 - m)$$

The parameter $m$ measures the degree of *misprediction* of adaptation. The higher it is, the closer the individual’s predicted preferences from initial ones. The parameter $\alpha_{m}$ is the degree of *predicted adaptation*. It increases with $\alpha$ but decreases with $m$. As long as $0 < m < 1$, the predicted health capital, $\hat{h}_{1}$, lies between the true health capital after adaptation, $h_{t}^\alpha$, and the one that the individual would have had without adaptation if his future tastes were identical to his current ones, $h_{i}$:

$$h_{t}^\alpha > \hat{h}_{1} > h_{i} \quad \text{for} \quad \alpha > 0 \text{ and } 0 < m < 1$$

\(^{(7)}\) This other way to model adaptation fits well incidentally with the fact that the gap between subjective perceived age and biological age tend to increase as people get older (see for instance Demakakos, Hacker and Gjonca, 2006)
In other words, the individual predicts the direction of the change involved by adaptation \( \hat{h}_1 > h_1 \) but underestimates its intensity \( \hat{h}_1^\alpha > \hat{h}_1 \). This assumption also implies that:

\[
\forall c_1 > 0 \quad u(c_1, \hat{h}_1^\alpha) > u(c_1, \hat{h}_1) > u(c_1, h_1)
\]

### 3. SAVING DECISIONS IN TWO-PERIOD MODELS (YOUNG/OLD) WHEN PEOPLE MISPREDICT THEIR COGNITIVE ADAPTATION TO OLD AGE

#### 3.1 A simple two-period model

To see how adaptation and people’s inability to predict it correctly affects saving decisions, let us consider a simple two-period model where the interest rate \( r \), the discount factor \( \delta \), the incomes for both periods \( (y_0, y_1) \) are exogenous. The objective health levels for both periods are also exogenous with \( h_1 < h_0 \). This last hypothesis is a simplification of course and it is relevant to raise the question of the interplay between health investment and saving in the spirit of health demand model like Grossman (1972). Here we concentrate on the saving decision by considering \( h_1 \) and so \( \hat{h}_1 \) exogenous. It may not be too unrealistic for those people who believe that they cannot change many things about their future health level beyond a standard health investment. Under the previous assumptions, and after integrating the constraint, the individual seek to maximize his predicted total utility of the person over the two periods following the program:

\[
\max_{\hat{s}} \hat{U}(s) = u(y_0 - s, h_0) + \delta \cdot u(c_1, \hat{h}_1)
\]

Except that we now reason with \( \hat{h}_1 \), nothing is changed compared to the usual optimization program without adaptation. The first order condition is:

\[
u_1 \left( y_0 - s^*, h_0 \right) - \delta \cdot u_1 \left( y_1 + y_0 + (1 + r)s^*, \hat{h}_1 \right) = 0
\]

The effect of a marginal change in the degree of predicted adaptation \( \alpha_m \) on \( s^* \) is given by:

\[
\frac{ds^*}{d\alpha_m} = -\frac{-\delta (1 - \alpha_m) u_{21} (y_1 + y_0 + (1 + r)s^*, \hat{h}_1)}{-u_{11} (y_0 - s^*, h_0) - \delta (1 + r) u_{11} (y_1 + y_0 + (1 + r)s^*, \hat{h}_1)}
\]

It depends on the sign of \( u_{1h} = (\text{sign } u_{12}) \). Specifically, we have:

\[
\text{sign } ds^*/d\alpha_m = \text{sign } u_{1h}
\]

To understand the meaning of this equivalence, suppose first that the marginal utility of consumption increases with health capital \( u_{1h} > 0 \). Remembering that \( \alpha_m \) decreases when \( m \) (which measures the degree of underestimation by the individual of his adaptation) increases, we get:
\[ \text{sign } \frac{ds}{d\alpha_m} \geq 0 \text{ and sign } \frac{ds}{dm} \leq 0 \quad \text{for } u_{ch} > 0 \]

The future consumption level chosen by the individual will be all the higher that \( \alpha \) is high but \( m \) is low. Actually, with adaptation, all happens as if the level of health at the second period was higher, which increases the utility of future consumption and so the incentive to save if \( u_{ch} > 0 \). As long as they underestimate their degree of adaptation (\( 0 < m < 1 \)) however, individuals do not raise enough their saving. They undersave. Put it simply, because they perceive that old age, after all, will not be so awful, they put more money aside for their old days, but not as much as they would if they correctly perceived their adaptation. We can sum up by writing:

\[
\begin{align*}
\text{s^* (without adaptation)} &< s^* (\text{with partially predicted adaptation}) &< s^* (\text{with correctly predicted adaptation}) \\
\alpha_m = 0 &< \alpha_m < 1 &\alpha_m = \alpha
\end{align*}
\]

The saving choice remains optimal (if we compare it with the perfect prediction case) only if the marginal utility of consumption does not depend on health. Thus, the sign of the cross partial derivative plays a crucial role in this model. All things equal and independently of the discount factor, does the individual prefer to consume more goods when he is young and healthy or older and less healthy? We will return to this point later but it can be already noted that the previous result shows that mispredicting adaptation cannot be reduced to a simple myopia towards one’s future self. When \( u_{ch} > 0 \), any adaptation encourages the individual to increase saving and the failure to predict adaptation leads him to undersave. And we could obviously reach the same conclusion by considering a myopic individual and model it alternatively by a unrealistically low discount rate \( \bar{\delta} \) such that:

\[
\bar{\delta} \cdot u_t \left( y_1 + y_0 + (1 + r)s^*, h_t \right) = \delta \cdot u_t \left( y_1 + y_0 + (1 + r)s^*, \hat{h}_t \right)
\]

By focusing on one of the most important determinants of the long-term subjective discount factor used by individuals\(^8\), the previous reasoning helps to give theoretical and empirical basis for the assumption of pure myopia. However, the similarity of the effect of both cognitive biases on saving exists only for \( u_{ch} > 0 \).\(^9\) As soon as \( u_{ch} < 0 \), the individual oversaves, behaviour that we can’t explain by considering a unrealistic negative high discount rate this time\(^10\). The two biases are actually different: By definition, discounting reduces the present value of total and marginal utility of future consumption (for \( c_1 \) and \( h_1^u \) given). Mispredicting adaptation also reduces the (present) value of the total utility of future consumption (for \( c_1 \) and \( h_1^u \) given), but depending on the sign of \( u_{ch} \), decreases or increases the marginal utility of future consumption.

3.2 Introducing uncertainty about the future health level

In the previous model, the individual was inaccurately predicting the gap between his subjective and an objective and certain health stock. Given that in reality, health investment possess a stochastic component, it is interesting to ask whether this uncertainty affects the previous result and

\(^8\) Mispredicting adaptation is only one new parameter among many others (dread, savouring, liquidity constraints, etc..) whose influence would be ascribed to \( \delta \) otherwise.

\(^9\) Empirically, it also means that it could be difficult to disentangle the distinct effects of the preference for the present and the misprediction of adaptation on savings since both reduce saving when \( u_{ch} > 0 \).

\(^10\) Frederick, Loewenstein & O’Donoghue (2002) provide a clear discussion of the necessity to make a distinction between time discounting and pure time preference.
how. To see what happens, suppose we add a white noise so that the health capital of the second period, now written $\hat{h}_1$, becomes:

$$\hat{h}_1 = h_1 + \hat{\varepsilon}$$

with $E[\hat{\varepsilon}] = 0$

If we substitute in (2), we obtain the “predicted random” health capital for the second period, let’s write it $\hat{h}_1$:

$$\hat{h}_1 = \hat{h}_1 + (1 - \alpha_m)\hat{\varepsilon}$$

Except that the reasoning is now made with this random variable and that the individual seeks now to maximise his expected predicted utility\(^{11}\) over the two periods, the program is similar to the previous one:

$$\text{Max } \hat{U}(s) = u(y_0 - s, h_0) + \delta \cdot E \left[ u \left( y_0 + y_1 + (1 + r)s, \hat{h}_1 \right) \right]$$

With $s^{**}$ representing the chosen level of health in presence of risk, the first order condition is now given by:

$$u_1 \left( y_0 - s^{**}, h_0 \right) = \delta \cdot E \left[ u_1 \left( y_1 + y_0 + (1 + r)s^{**}, \hat{h}_1 + (1 - \alpha_m)\hat{\varepsilon} \right) \right]$$

Let us define now $s^*$ as the chosen level in presence of risk, the previous condition becomes:

$$u_1 \left( y_0 - s^*, h_0 \right) = \delta \cdot u_1 \left( y_1 + y_0 + (1 + r)s^*, \hat{h}_1 \right)$$

(3)

It is straightforward to see that:

$$\frac{d}{ds} \hat{U}(s^*) = -u_1 \left( y_0 - s^*, h_0 \right) + \delta \cdot E \left[ u_1 \left( y_1 + y_0 + (1 + r)s^{**}, \hat{h}_1 + (1 - \alpha_m)\hat{\varepsilon} \right) \right]$$

And given (3)

$$\frac{d}{ds} \hat{U}(s^*) = \delta \cdot E \left[ u_1 \left( y_1 + y_0 + (1 + r)s^{**}, \hat{h}_1 + (1 - \alpha_m)\hat{\varepsilon} \right) \right] - \delta \cdot u_1 \left( y_1 + y_0 + (1 + r)s^*, \hat{h}_1 \right)$$

For the individual to choose $s^{**} > s^*$, we must have

$$E \left[ u_1 \left( y_1 + y_0 + (1 + r)s^{**}, \hat{h}_1 + (1 - \alpha_m)\hat{\varepsilon} \right) \right] > u_1 \left( y_1 + y_0 + (1 + r)s^*, \hat{h}_1 \right)$$

\(^{11}\) The term “expected predicted utility” refers to the idea that the individual tries to predict at the first period his adaptation to a future lower exogenous health capital, whatever the uncertainty attached to this future health capital.
And this inequality holds if \( u \) is positive convex with respect to the second variable, that is if \( u_{21} \) is positive. This behaviour can be viewed as a sort of precautionary saving and has been labelled by Eeckhoudt, Rey and Schlesinger (2007) as “cross prudence”, here of consumption. From the perspective of this paper, the consequences for saving of underestimating adaptation to old age, it is worth noticing two things:

1) Given that the optimal saving that must be allocated to health production in a world of uncertainty, let’s write it \( s^{opt} \) (calculated with \( m = 0 \)), moves in the same direction as the chosen level \( s^* \) depending on risk preferences, the individual still undersave as long as \( u_{ch} > 0 \) and that he underestimates his ability to adapt to old age. On the contrary, he oversaves if \( u_{ch} < 0 \). Thus, uncertainty about the future objective health level does not change the qualitative nature of the previous results synthesized in inequation (2).

2) Adaptation reduces the effect of health uncertainty on health investment. To see why, just take the variance of the predicted level of health defined as a random variable. Remembering that \( \alpha_m = \alpha (1 - m) \), we have:

\[
\text{Var}(\hat{h}_1) = (1 - \alpha_m)^2 \text{Var}(\tilde{h}_1) \quad \text{with} \quad \text{Var}(\tilde{h}_1) = \text{Var}(\tilde{e})
\]

As soon as the individual adapts (\( 0 < \alpha < 1 \)) and for \( m < 1 \), \( \text{Var}(\hat{h}_1) < \text{Var}(\hat{h}_1) \). The predicted future health level after adaptation \( \hat{h}_1 \) on which the individual bases his decision does not potentially vary as much as the objective level (\( \tilde{h}_1 \)). Exactly, for each unit of deviation of \( \hat{h}_1 \) from its expected value, the predicted level after adaptation will change only by \( (1 - \alpha_m) \) unit. As a consequence, and with \( u_{21} \neq 0 \), the individual is not pushed to change his saving behaviour with the same intensity. More generally, uncertainty about the future health level has all the less importance on health investment that people adapt and predict that adaptation. In the extreme case of a perfect adaptation and of a perfect prediction of this adaptation, \( \alpha_m = 1 \) and so \( \text{Var}(\hat{h}_1) = 0 \). The uncertainty about the health level does not affect the predicted health level any longer so that \( \hat{h}_1 = h_0 \). The interesting corollary is that mispredicting adaptation amplifies the effect of uncertainty on health saving behaviour since any increase in \( m \) raises \( \text{Var}(\hat{h}_1) \) for \( \alpha > 0 \). A prudent individual for instance will wrongly increase his saving all the more that he underestimates adaptation.

4. DISCUSSION

The sign and the intensity of the cross partial derivative between consumption and health in the utility function play a critical role in the previous model. What can be said about them? All things equal and independently of the time discount factor, do people prefer to consume more goods when they are young and healthy (in which case \( u_{ch} > 0 \)), when they are older and less healthy (\( u_{ch} < 0 \)), or are they indifferent (\( u_{ch} = 0 \))? Clearly, some non medical goods, like sports or intense travelling appear to be complement of good health and favour the positivity of \( u_{ch} \). Some others, like prepared meals or personal home assistance appears as substitutes (\( u_{ch} < 0 \)). And where to place restaurants?

The point is that, without adaptation, even a slightly positive or negative sign can have a substantial effect on the optimal level of life cycle savings. For instance, using a CRRA utility function Finkelstein, Luttmer and Notowidigdo (2008) calibrated with roughly standard values (\( r = 0.05, T = \)))
25 years, δ = 0.04) a simple two-period model in which the agent must decide how much of her first-period fixed wage to save for consumption in the second period. They showed that varying the effect of health shocks on the marginal utility of consumption by 20 percentage points holding risk aversion fixed has roughly the same effect on the optimal fraction of earnings saved as varying risk aversion between 2 and 4 under the assumption of no state dependence (υ_{ch} = 0). This is a substantial sensibility given the large range of estimates for risk aversion that invites to turn to empirical research.

However, the evidence is still scarce and largely controversial. Among methods used so far, the first consisted in analysing the variations in self-reported compensating differentials to hypothetical health risks across individuals of different income levels. The health risks presented in this kind of studies were exposure of chemical workers to new chemicals such as asbestos or TNT (Viscusi and Evans, 1990), exposure of consumers to different injuries from insecticides or toilet bowl cleaners (Evans and Viscusi, 1990), exposure of individuals to multiple sclerosis (Sloan et al., 1998). With this dichotomous approach of health (healthy/not healthy), the three studies favoured the υ_{ch} ≥ 0 assumption. Specifically, the marginal utility of income in the diseased state was estimated to be 8% of the marginal utility in healthy state by Sloan et al. (1998), between 77% and 93% by Viscusi and Evans (1990) and roughly identical by Evans and Viscusi (1990). This large range of estimates surely reflects the differences in the diseases studied. Instead of using surveys, Lillard and Weiss (1997) studied the variation in consumption profiles across individuals with different health trajectories on the premise that individuals should increase consumption in periods when marginal utility is high and decrease it in periods when marginal utility is low. Based on American data, they found on the contrary a negative υ_{ch} with a marginal utility of consumption in the sick state 55% higher now than that in the healthy state. Thus, as Luttmer Erzo and Notowidigdo (2009) conclude their survey on the topic, “the currently available estimates offer little in the way of a consensus on the sign or magnitude of health state dependence”. Given our particular definition of health capital which refers in fact to “youth capital”, the uncertainty is even larger. One possibility is that the sign of υ_{ch} is not constant in fact and depends on age, being negative for small deterioration (the beginning of old age) and becoming positive when physical impairment becomes significant.

5. CONCLUSION

The tendency for young people to underestimate their future capacity to adapt to old age is a very common cognitive process which should logically affect their intertemporal long-term choices. The main objective of this paper was theoretical: to establish its main consequences on long term saving using unspecified utility function with standard properties. It relies on a central double assumption: If an individual adapts at least partially to the negative consequences of old age, he will draw more utility from a same stock of youth/health when old than young but the marginal utility of health will be lower. For the individual, all happens as if, because of adaptation, the subjective level of health/youth does not decrease as fast as his objective level. Under these general assumptions, and in a small two-period young/old model of saving, the two following results are obtained:

i) When individuals take their future health as given, and if the marginal utility marginal of consumption increases with health, adaptation to old age leads them to increase their saving. As long as they underestimate this adaptation though, this saving remains suboptimal and people undersave. When the marginal utility of consumption depends negatively of health, people oversave for symmetric reasons.

ii) The introduction of uncertainty about the future health level does not affect qualitatively the previous results because it changes both the equilibrium and the optimal saving levels in the same direction. However, mispredicting adaptation amplifies the effect that uncertainty has on saving. If
the individual is cross-prudent in the sense of Eeckhoudt, Rey and Schlesinger (2007), then the individual will increase his saving all the more that he underestimates cognitive adaptation to old age.

Despite its importance for any theory about long-term saving, there is no clear evidence about the magnitude and even the sign of the cross marginal utility between consumption and health. Many other issues could be raised of course in particular about the timing of adaptation and about a possible trade-off between health investment and financial investment. To go further, some of the conclusions of the previous models have also to be tested empirically. The important point is however that cognitive adaptation and its misprediction are well-established facts. The previous model showed that they can amplify or correct the effects of other cognitive biases identified in the literature like an unrealistically high discount rate or time-inconsistent preference for immediate gratification (Donohue and Rabin, 1999 for instance).

References


