

OPPORTUNITIES, ASPIRATIONS AND LIFE SATISFACTION

My one regret in life is that I am not someone else.

Woody Allen

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Abstract

The idea that expanding work and consumption opportunities *always* increases people's wellbeing is well established in economics but finds no support in psychology (Schwartz and al. 2002). Instead, there is evidence in both economics and psychology that people's life satisfaction depends on how *experienced utility* compares with expectations of life satisfaction or *decision utility* (Kahneman et al., 1997, Clark and Oswald, 1997; Easterlin, 2005; Clark, Frijters and Shields M., 2007).

In this paper I suggest that expanding work and consumption opportunities are a good thing for decision utility but may not be so for experienced utility. To show this, I develop an empirical model where people's experienced and expected life satisfaction depend on education and environmental opportunities. Building on Easterlin (2001), I argue that people may overrate their future socioeconomic prospects relative to real life chances and I discuss how systematic frustration over unfulfilled expectations is endogenously generated and can adversely affect life satisfaction. I suggest that the aspirations-induced bias in prediction and its impact on life satisfaction depend not only on people's perceived work and consumption opportunities, but also on personal characteristics such as gender and age.

Indeed, the model aspires to provide more general insights into how to model and explain the age and gender-life satisfaction relationships centred on the role of education in the construction of aspirations.

I test the model's predictions on Italian data and find support for the idea that education and access to stimulating environments may have a perverse impact on life satisfaction. I also find evidence, consistent with the empirical contributions available, that the impact of aspirations on life satisfaction is mediated by factors such as gender and age.

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1. Introduction

The idea that expanding work and consumption opportunities *always* increases people's wellbeing is well established in economics but finds no support in psychology (Schwartz et al. 2002; Schwartz, 2000; Roese and Summerville, 2005). Indeed, it even contrasts with casual observation of people's behaviour. Instead, there is evidence in both economics and psychology that people's life satisfaction depends greatly on how *experienced utility* compares with expectations of life satisfaction or *decision utility* (Kahneman et al., 1997; Clark and Oswald, 1997; Clark, Frijters and Shields, 2007). The issue is that whereas an expanded set of choices is good for *decision utility* it may not be so for *experienced utility*¹. But why is that?

Indeed, a wider opportunity set increases people's freedom to choose, but expanding options also imply psychological decision costs: "First, there is the problem of gaining information about the options to make a choice. Second, there is the problem that as options expand, people's standards for what is an acceptable outcome rise. And third, there is the problem that as options expand, people may come to believe that any unacceptable results are their own fault, because with so many options, they should be able to find a satisfactory one. Similar problems arise as choice becomes available in domains in which previously there was no choice." (Schwartz et al., 2002, p. 1179).

On the basis of these premises, in this paper I study how and why people's perception of the opportunities available to them is endogenously generated and how it affects experienced utility, i.e. life satisfaction. I argue that, leaving aside random factors, the main difference between decision utility and life satisfaction stems from the role of aspirations which are the benchmark for people's evaluation of their experienced utility in different life domains. In this context, I investigate how people's aspirations are connected to their subjective characteristics such as education, age and gender as well as to objective factors such as access to environmental opportunities.

From an empirical viewpoint, the connection between education and life satisfaction is quite strong, has manifold facets, and the effects of education on income are just a small part of the story "the educational tracking of persons leads to persistent differences in well-being" (Easterlin, 2001 p. 481). Above all, although education is invariably found to be an important explanatory variable of life satisfaction, so far few systematic efforts to explain its various and interconnected functions have been made.

Indeed, the socio-economic performance of individuals depends, over and above the effects of innate abilities and their socioeconomic backgrounds, on the cognitive and noncognitive skills acquired early in life² through education and experience: "Cognitive and noncognitive skills can affect

¹ *Decision utility* is inferred from choices and used to explain choices whereas *experienced utility* refers to the hedonic experience associated with an outcome (Kahneman and Thaler, 2005, p. 2).

² The supporting empirical evidence on the impact of cognitive and non-cognitive skills on an individual life is impressive. As far as cognitive skills are concerned, the list of individual characteristics correlated with the standard measurement tests is indeed long (Kuncel, Hezlet and Ones, 2004; Ree and Carretta, 2002), ranging over: abilities (analytical style, memory, reaction time, reading), creativity (craftwork, musical ability), health and fitness, interests (breadth and depth of interests, sports participation), morality (delinquency, lie scores, racial prejudice, values), perceptual elements

the endowment of persons, their preferences, their technology of skill formation...or all three. Thus, they might affect risk preference, time preference, and efficiency of human capital productivity without necessarily being direct determinants of market wages. Cognitive and noncognitive skills might also raise the productivity of workers and directly affect wages. Our empirical analysis shows that both cognitive and noncognitive skills play multiple roles” (Heckman, Stixrud and Urzu, 2006, p. 8). Therefore, it is hardly surprising if psychological studies show that educational choices³ are the most important source of regret in life (Roese and Summerville, 2005). The latter may stem from inappropriate educational choices attaining both level and type of education.

On these grounds, in this paper I develop an empirical model based on the following assumptions:

- a) cognitive and noncognitive skills are partly innate and partly acquired in childhood through education;
- b) people’s work and consumption opportunities depend on these skills and on environmental opportunities;
- c) life satisfaction stems from the intrinsic and extrinsic rewards generated by different work and consumption activities;
- d) people’s aspirations depend on their skills and environmental opportunities.
- e) people do not anticipate the impact of the gap between their aspirations and their actual performance on experienced utility, i.e. people are prone to an aspirations-induced bias in prediction.
- f) the bias in predictions induced by aspirations mostly affects those activities yielding extrinsic rewards.

I posit that, in analysis of the education-life satisfaction connection, one should consider that education raises both people’s opportunities and aspirations and, to the extent that the education-elasticity of aspirations is larger than the education-elasticity of opportunities, education may exert a perverse effect on experienced life satisfaction. Moreover, I argue that the latter elasticities as well as the impact of the gap between aspirations and real life chances on life satisfaction are critically affected by gender and age.

In order to test the prediction produced by the model, I use data drawn from the Survey on Household Income and Wealth (SHIW), conducted by the Bank of Italy (2004) and, to account for the

(ability to perceive brief stimuli, field-independence, myopia), personality (achievement motivation, altruism, dogmatism) and practical skills (practical knowledge, social skills). The socioeconomic outcomes that appear to depend on these cognitive abilities include almost all the factors that have been found directly or indirectly to affect life satisfaction, namely: educational achievement, occupational status, income, delinquency and criminal behaviour, poverty, divorce, having an illegitimate child, being on welfare, having an underweight baby, etc. (Schmidt, 2002; p.200). Leaving such specific socioeconomic outcomes aside, psychological studies suggest that the acquisition of cognitive and noncognitive abilities in childhood helps determine most of the work and consumption skills available during adulthood.

³ According to a meta-analysis of the causes of regret, 32% of people indicate education. The second most cited item is career (22%), the third romance (15%), (Roese and Summerville, 2005).

role of environmental factors in shaping external work and consumption opportunities, I include province-level data on creativity drawn from Florida and Tinaglia (2005).

The results lend support to my hypotheses and suggest that the impact on life satisfaction of the education-induced gap between decision and experienced utility depend on gender and age. In particular, I find that the educational attainment above which the latter start to exert a negative effect on life satisfaction through aspirations is secondary school. This is not surprising, and it is consistent with the idea that, whereas primary education is targeted to provide the basic cognitive and non-cognitive skills required in any life domain, the main scope of secondary and tertiary education is to develop those skills and incentive-enhancing preferences required in the labour market (Bowles, Gintis and Osborne, 2001), which also fuel socioeconomic aspirations, i.e. material aspirations (Easterlin, 2001).

I find also a *U-shaped* life satisfaction-age relationship consistent with the idea that, over time, people affected by the education-induced prediction bias (*EIPB*), may revise socioeconomic aspirations and adapt to the systematic frustration of their expectations (Easterlin, 2003; 2005; 2006). Finally, the results would suggest that the positive impact on life satisfaction of being female should be related to the gender specific impact of optimism on aspirations (Puri and Robinson, 2007).

The main contributions offered by this paper in relation to previous work are the following. First, I explicitly posit and provide support for this choice to take it that secondary and tertiary education measure, in addition to unobservable people's skills, also people's unobservable socioeconomic aspirations. Second, in order to measure people's perceived opportunities, I include an objective measure of their external opportunities based on an index of environmental creativity. Third, I propose a unifying interpretative framework of the available literature on the age-happiness (Blanchflower and Oswald, 2007) and gender-happiness (Clark, 1997) relationships, based on the central role of education. Finally, I stress that happiness studies should be more concerned with education rather than income as the primary source of aspiration-building in different life domains.

The paper is organized as follows. In Section 2, I discuss the distinction between *decision and experienced utility* and the role played by aspirations in this context. In Section 3 I introduce our empirical model. In section 4 I discuss the empirical strategy and results. In Section 5 I draw the main conclusions.

2. Decision vs. experienced utility

At the heart of economic theory lies the idea that choices are based on unbiased predictions of the hedonic experiences associated with choices: "The economist's traditional picture of the economy resembles nothing so much as a Chinese restaurant with its long menu. Customers choose from what is on the menu and are assumed always to have chosen what most pleases them. That assumption is unrealistic, not only of an economy, but of Chinese restaurants. Most of us are unfamiliar with nine-tenths of the *entrées* listed; I seem invariably to order either the wrong dishes or the same old ones.

Only on occasions when an expert does the ordering do we realize how badly we do on our own and what good things we miss." (Scitovsky, 1992, p. 149-150).

The main limit to rational choices stems from the fact that "people do not always know what they will like; they often make systematic errors in predicting their future experience of outcomes and a result fail to maximize their experienced utility" (Kahneman and Thaler, 2007, p.3). Indeed, regret is probably the feeling most common to humankind, and it regards, with significant differences, all life domains (Roese and Summerville, 2005).

A number of experiments have shown that people make systematic errors in predicting their future experienced utility even in very simple decision settings (Kahneman and Snell, 1990; 1992), and psychologists have laboured to explain why this is so. In this paper I argue that there is a main systematic endogenous source of errors in predictions, i.e. people's aspirations: insofar as they fail to anticipate the endogenous change of aspirations correctly (Easterlin, 2001, Stutzer, 2004) they may experience systematic frustration of their expectations.

Indeed, education is a generally recognised endogenous source of change in life satisfaction in that it enhances people's actual and perceived socio-economic opportunities. Not surprisingly, educational choices are the most important potential source of regret in life (Roese and Summerville, 2005). Hence, I believe that educational attainment is a natural candidate to explain the gap between decision and experienced utility and, thereby, the determinants of life satisfaction.

The second candidate is to be seen in environmental opportunities. It is reasonable to suppose that the perceived freedom of choice is also related to the external availability of opportunities. As such, the latter codetermine people's aspirations and, eventually, the gap between decision and experienced utility. Above all, the extent to which external opportunities are perceived as such depends on people's skills and innate propensities. Therefore, the endogenous building up of aspirations should be related to environmental opportunities and the interplay between an individual's education and the latter.

2.1. Education and the technology of preferences/skill formation⁴

People like most what they are best able to appreciate, so that skills are essential to express preferences. In fact, this reasoning applies to all human activities. Notwithstanding, economists are in the habit of collapsing skills into preferences: this operation appears inappropriate whenever the aim of the analysis is to disentangle acquired from innate sources of preferences.

On these grounds, in my analysis I posit that people can extract wellbeing from work and consumption activities, provided they are endowed with the appropriate skills. Let us define a *matching function* $\psi = \psi(D, X, I)$, $0 \leq \psi \leq 1$, describing the extent to which the level and quality of *education* D and the variety and quality level of *experiences* X "match" innate preferences I , and a

⁴ Sections 2.1. and 2.2. are based on Ferrante, 2007. The aim of the analysis here is not to develop a full-fledged microeconomic model but to provide a more rigorous treatment of the analytical bases to the empirical model.

function $F : D \times X \rightarrow [0, +\infty)$, strictly increasing and strictly concave in both its arguments, that describes the extent to which education D and experience X can enhance cognitive and noncognitive skills.

Following Cunha and Heckman (2007), I work on the assumption that, during childhood, innate taste and non-cognitive abilities I , as much as education D and experience X , determine the amount K of acquired cognitive and non-cognitive skills, i.e. *human capital*, according to a technology $K = K(D, X, I)$ that is defined as follows:

$$K(D, X, I) := \psi(D, X) \cdot F(D, X) \quad (1)$$

Thus, the amount of life satisfaction-enhancing skills acquired during childhood that can be deployed during adulthood depends on the interaction among innate propensities, education and experiences. I also suppose that the ability of individuals to react to environmental stimuli is positively related to their endowment of K .

Building on the self-determination theory (SDT, Deci and Ryan, 2000), I suggest that the extent to which education and experience match innate traits and help to enhance life satisfaction depends on how much they contribute to satisfying three innate psychological needs: autonomy, competence and relatedness⁵. Moreover, following Bowles, Gintis and Osborne (2001), I argue that one of the main objectives of education is to help people develop those incentive-enhancing preferences most required in the labour market. In particular, I posit that whereas below secondary school people acquire the basic skills required in any life domain and necessary to satisfy the three innate psychological needs, during secondary and tertiary education they predominantly learn how to respond to the type of stimuli and opportunities generated within the labour market, i.e. they learn how to respond to the labour market incentive mechanisms relying on extrinsic socioeconomic rewards.

Hence, I posit that above middle school, educational choices are determined by the socioeconomic concerns, expectations and background of parents, in that secondary and tertiary education develops those skills required in activities yielding extrinsic socioeconomic rewards.

The data on educational choices and motivations of children applying to secondary school in Italy provide strong empirical support for this idea. The data show that most children do not know their tastes and talents, that this ignorance is shared by the majority of the children's parents and that, consequently, educational choices are governed by parents' expectations, educational achievement and economic status. Moreover, the first two motivations behind schooling choices declared by children

⁵ "The starting point for SDT is the postulate that humans are active, growth-oriented organisms who are naturally inclined toward integration of their psychic elements into a unified sense of self and integration of themselves into larger social structure. In other words, SDT suggest that it is part of the adaptive design of human organism to engage interesting activities, to exercise capacities, to pursue connectedness in social groups, and to integrate intrapsychic and interpersonal experiences into a relative unity.[...] Accordingly, innate psychological needs for competence, relatedness and autonomy concern the deep structure of the human psyche, for they refer to innate and life-span tendencies toward achieving effectiveness, connectedness, and coherence". (Deci and Ryan, 2000, p. 229).

are to attend the same school as their friends, to find an appropriate social environment and the desire to adhere to parents' expectations, whereas personal propensities rate last in the list⁶.

On the basis of these premises, I distinguish skills acquired through education according to their contribution to intrinsic vs. extrinsic rewards, i.e.

$$K_i(D, X, I) := \psi_i(D, X) \cdot F_i(D, X)$$

where $i = I, E$ indicates whether the skills concern activities yielding intrinsic (I) or extrinsic (E) rewards.

2.2. Decision utility and the context specific nature of skills

Perceived opportunity in any life domain depends on innate talents and acquired skills. Some people may have an innate propensity to enjoy jazz and the skills to do so while others may like sports and possess the appropriate skills to practise them: the former will respond positively to the availability of jazz concerts, the latter to opportunities to practise various sports.

The actual matching between environmental stimuli, on the one hand, and skills and innate talents, on the other, is also essential to determine life satisfaction through the availability of appropriate work opportunities. For instance, individuals endowed with artistic talents and skills will have broader scope to find a good job in places where the culture industry is more developed whereas individuals possessing technical skills and talents will find it more appealing to live in high-tech industrial districts⁷.

Hence, the opportunity to respond pro-actively to environmental stimuli is constrained by (a) the extent to which the stimuli match innate propensities and (b) the extent to which the stimuli match acquired skills K . Building on these assumptions, let us define a *matching function* $\theta := \theta(I, K, E)$, $0 \leq \theta \leq 1$, describing how environmental stimuli E “match” innate talent I and acquired skills K ; it follows that the amount of subjectively perceived environmental stimuli ES enjoyed by an individual can be expressed as:

$$ES := \theta(I, K, E) \cdot E \tag{2}$$

3. Decision utility and choices

Let us suppose that people can perform two sets of work and consumption activities, yielding, respectively, intrinsic (I) and extrinsic (E) rewards, and that both intrinsic and extrinsic rewards

⁶ I believe that this picture does not greatly differ from that of other countries.

⁷ Again building on the self-determination theory, I assume here that the extent to which environmental stimuli match innate traits and skills depends on how much they can contribute to satisfying the innate psychological needs for autonomy, competence and relatedness.

depend on endowments of activity-specific skills K_I, K_E as well as environmental stimuli ES . Thus, the life satisfaction relevant for decision-making (LS^{DU}) is⁸:

$$(1) \quad LS^{DU} = \lambda LS^I(K_I, ES) + (1 - \lambda) LS^E(K_E, ES) + \varepsilon$$

where LS^i , $i = I, E$ is positive and concave in its arguments, λ is specific to individuals and ε is a normally distributed error term with zero mean. Let us assume that the acquisition of each unit of K_i , yields pecuniary and non-pecuniary costs of c_i such that the total cost is $C = c_I K_I + c_E K_E$.

Now, suppose that innate talents and environmental stimuli are not observable/known in advance and that the decision about K_i is taken, within the household, by the parents. Hence, the actual matching between skills, environmental stimuli and talent is not a decision variable; the parents' problem is to maximize (1) with respect to (K_I, K_E) given innate personality traits, c_i , λ , and ES . The standard solution of the maximization problem yields people's skills and the corresponding expected total life satisfaction, i.e.

$$2) \quad \begin{aligned} \text{Max } L^{DU} &= E[\lambda LS^I(K_I, ES) + (1 - \lambda) LS^E(K_E, ES) + \varepsilon] + \phi[C - c_I K_I - c_E K_E] \\ \text{w.r.t. } K_i & \end{aligned}$$

$$(3) \quad \begin{aligned} \frac{\partial L^{DU}}{\partial K_I} &= \lambda \frac{\partial LS^I}{\partial K_I} - \phi c_I = 0 \\ \frac{\partial L^{DU}}{\partial K_E} &= (1 - \lambda) \frac{\partial LS^E}{\partial K_E} - \phi c_E = 0 \\ \frac{\partial L^{DU}}{\partial \phi} &= C - c_E K_E - c_I K_I = 0 \end{aligned}$$

from which I obtain the equilibrium condition for the marginal rate of substitution between K_I and K_E :

$$(4) \quad \Rightarrow MRS_{I,E}^{DU} = \frac{\frac{\partial LS^E}{\partial K_I}}{\frac{\partial LS^I}{\partial K_E}} = - \frac{(1 - \lambda) c_I}{\lambda c_E}$$

3.1. Opportunities, aspirations and experienced utility

The empirical evidence on the direct effects of education on life satisfaction is somewhat vague, whereas the evidence about its effects on job satisfaction is clear: higher educational attainments reduce job satisfaction (Clark, 1997; Ferrer-i-Carbonell and Frijters, 2005). One may

⁸ For the sake of simplicity I neglect the subscript "i".

wonder why people invest time and efforts acquiring education if this depresses their job satisfaction. According to revealed preferences, for a rational agent this may simply be due to biased predictions of the impact of education on job and life satisfaction⁹. In fact, skills affect job and life satisfaction also through the aspirations and the corresponding expectations they generate.

Here, I posit that the chance of experiencing frustration over unfulfilled expectations increases with educational attainment and environmental opportunities since they raise both the level of job and life aspirations and the variance of the socioeconomic outcomes. This assumption is in line with the empirical evidence showing that the gap between actual and expected outcomes has a systematic component, i.e. people, at any age, tend to overrate their future prospects, and that the gap between expectations and real life opportunities narrows for older people¹⁰ (Easterlin, 2001; 2005).

By the same reasoning, one should expect the life satisfaction of any individual to depend also on how her/his labour income compares with the average income of individuals living in the same place and holding the same observable characteristics of age, sex and schooling. One should also suppose that higher educational attainments and more favourable labour market conditions would magnify differences in people's unobservable characteristics. On these grounds, the gap between actual and expected income of the less talented, less fortunate people should widen with schooling and labour market opportunities.

To simplify our analysis, let us suppose that experienced utility, unlike decision utility, also includes the effect of the gap between decision and experienced life satisfaction, with the important qualification that the gap regards only those activities yielding extrinsic rewards. I posit that expectations are determined by a biased prediction of the true value of such rewards that I call aspirations, i.e. $LA^{EA} = LA^{EA}(\eta K_E, \eta ES) + \varepsilon$, where $\eta \geq 1$ measures how responsive aspirations are to K_E and ES and ε is normally distributed with zero mean; assuming homogeneity of degree one of LS^E , I get $LA^{EA} = \eta LA^{EA}(K_E, ES)$. The skills and environmental opportunities-elasticity of aspirations are, respectively, $v_K = \eta \frac{\partial LS^E}{\partial K_E} \frac{K_E}{LS^E}$ and $v_{ES} = \eta \frac{\partial LS^E}{\partial ES} \frac{ES}{LS^E}$. On the basis of these premises, experienced utility i.e. life satisfaction is given by:

$$(5) \quad LS^{EU} = \lambda LS^I(K_I, ES) + (1 - \lambda) \{ LS^E(K_E, ES) + \gamma [LS^E(K_E, ES) - LS^{AE}(K_E, ES)] + \varepsilon \}$$

where, $\gamma > 0$ measures the response of experienced life satisfaction to the degree of fulfilment of aspirations. Then, experienced utility is:

⁹ An alternative explanation of this outcome, which I endorse here, is that educational choices are taken by parents and that the latter do not know their children's preferences.

¹⁰ Indeed, the gap between actual and expected socioeconomic outcomes may also depend on personal characteristics unknown to individuals, such as unobservable abilities. The gap may persist even if people know their abilities but do not know other people's, and so are unable to assess the systematic link between abilities and reward.

$$(6) \quad LS^{EU} = \lambda LS^I(K_I, ES) + (1 - \lambda) \{ [1 - \gamma(\eta - 1)] LS^E(K_E, ES) + \varepsilon \}$$

So, I am assuming that activities yielding intrinsic reward generate both positive and negative effects on life satisfaction. I can now compute the maximizing levels of K_E and K_I of expected life satisfaction:

$$(7) \quad \begin{aligned} \text{Max } L^{EU} &= E[\lambda LS^I(K_I, ES) + (1 - \lambda) \{ [1 - \gamma(\eta - 1)] LS^E(K_E, ES) + \varepsilon \}] + \phi [C - c_I K_I - c_K K_K] \\ \text{w.r.t. } K_I & \end{aligned}$$

$$(8) \quad \begin{aligned} \frac{\partial L^{EU}}{\partial K_I} &= \frac{\lambda \partial LS^I}{\partial K_I} - \phi c_I = 0 \\ \frac{\partial L^{EU}}{\partial K_E} &= \frac{(1 - \lambda) [1 - \gamma(\eta - 1)] \partial LS^E}{\partial K_E} - \phi c_E = 0 \\ \frac{\partial L^{EU}}{\partial \phi} &= C - \phi c_E - \phi c_E = 0 \end{aligned}$$

=>

$$(9) \quad MRS_{I,E}^{EU} = \frac{\frac{\partial LS^E}{\partial K_I}}{\frac{\partial LS^I}{\partial K_E}} = \frac{(1 - \lambda) [1 - \gamma(\eta - 1)] c_I}{\lambda c_E}$$

Evidently the maximisation of experienced utility requires that people correctly anticipate the impact of aspirations on extrinsic socioeconomic reward. Of course, for $\eta = 1$ aspirations do not matter, i.e. decision and experienced utility coincide. Interpretation of the difference, between (3) and (9) is straightforward: when maximising experienced utility, people correctly anticipate the full impact of K_E on aspirations, i.e. people internalize the intrapersonal externality generated by K_E . Hence, for $\eta > 1$, when expectations are unfulfilled/ fulfilled, $|MRS_{I,E}^{DU}| > |MRS_{I,E}^{EU}|$ ($|MRS_{I,E}^{DU}| < |MRS_{I,E}^{EU}|$) and $\left(\frac{K_E^*}{K_I^*}\right)^{DE} > \left(\frac{K_E^*}{K_I^*}\right)^{EU}$ ($\left(\frac{K_E^*}{K_I^*}\right)^{DE} < \left(\frac{K_E^*}{K_I^*}\right)^{EU}$) people over-invest/under-invest in skills yielding extrinsic reward (K_E), thus generating an education-induced prediction bias (*EIB*), and the latter is increasing in γ , η and ES . Building on previous arguments on schooling, I suppose that, for educational attainments below the secondary level, $EIB = 0$ since $\eta = 1$.

3.3. Loss aversion and the asymmetric impact of *EIPB*.

So far we have assumed that life satisfaction would respond symmetrically to positive and negative errors in expectations. The psychological evidence supports the view that people value perceived gains and losses with respect to a reference utility level in different ways (Kahneman et al.,

1991), and that people's wellbeing is more responsive to losses than to gains, i.e. people show loss aversion.

On the grounds that the reference level of life satisfaction is its predicted level, one should expect *EIPB* to exert an asymmetric impact on life satisfaction. In the model, this asymmetric response to *EIPB* would imply that γ takes two values: γ_1 if $EIPB < 0$ and γ_2 if $EIPB \geq 0$, where loss aversion implies that $\gamma_1 \gg \gamma_2$.

It is reasonable to suppose that the asymmetric impact of *EIPB* on life satisfaction, over the life cycle, is governed by the same mechanisms of hedonic adaptation (Easterlin, 2005; Di Tella, Haisken and McCulloch, 2007) which determine people's adaptation¹¹ to other significant life events such as marriage, unemployment or becoming ill. In this respect, the empirical evidence shows that adaptation to positive pecuniary shocks is practically complete whereas it is incomplete in the case of non-pecuniary shocks, e.g. changes in status, such as becoming unemployed (Easterlin, 2005; Diener and Fujita, 2005, La Tella, Haisken and McCulloch, 2007).

Furthermore, one may wonder whether individual characteristics like age and gender systematically affect the functioning of the hedonic adaptation mechanisms and, therefore, the actual impact of *EIPB* on life satisfaction. Here I argue that that by learning from experience reactions to errors in prediction change over the life cycle.

As far as gender is concerned, according to van Praag and Ferrer-i-Carbonell (2004) men are more past oriented and more sensitive to the passage of time than women whereas Puri and Robinson (2007) suggest that women are less optimistic than men. Building on this evidence, I posit that γ and η may vary systematically with age and gender.

4. The empirical strategy.

My empirical strategy aims to disentangle the role of education and environmental factors in shaping people's perceived and actual socio-economic opportunities, on the grounds that life satisfaction depends on these opportunities and on the gap between actual and perceived opportunities. Due to lack of data on the latter environmental factors and in order to limit the sources of unobserved heterogeneity and measurement errors, in particular in income data, *in the estimation I consider a single country, Italy, and data on employees in the private and public sectors.*

Individual data are drawn from the Survey on Household Income and Wealth (SHIW¹²), conducted by the Bank of Italy (2004). Satisfaction with life is defined as, *the degree to which*

¹¹ It is worth stressing here that there are two main elements characterizing the hedonic adaptation mechanisms: their speed and completeness (Diener and Fujita; Oswald and Graham, 2006).

¹² The Survey began in the 1960s, originally gathering data on the incomes and savings of Italian households. The scope broadened over the years to include wealth and other aspects of household economic and financial behaviour and, since 2004, also a question on satisfaction with life. The sample in the most recent surveys comprises about 8,000 households distributed over 300 Italian municipalities and 103 provinces.

respondent rates positively, on a scale of 1 to 10, the overall quality of his or her present “life as a whole”.

Data on environmental opportunities/stimuli are drawn from Florida and Tinaglia (2005). They provide a very wide set of indicators for the 103 Italian provinces, including a *creativity* indicator. The latter is a composite index computed by Florida and Tinaglia (2005), based on three measures: Talent, Technology and Tolerance (Table 3). Provinces with higher scores for this indicator are expected to be both more attractive to “talented” people and also to offer advantages in terms of availability of new ideas, exchanges and information flows. I take it as a proxy of environmental socioeconomic opportunities.

Descriptive statistics on the variable included in our analysis are provided in Tables 1 and 2. I posit that life satisfaction is determined by both actual and perceived opportunities and that the latter depends on people’s skills and on environmental stimuli. Education, i.e. number of schooling years, is assumed to be a good proxy for people’s skills, in terms of cognitive and noncognitive abilities (Heckman, Stixrud and Urzua, 2006; Cuhna and Heckman, 2007).

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Happiness	1240	1	10	7.2113	1.6440
Age	1240	19	69	44.4903	9.2424
Income	1240	264	80000	16975.8056	8224.57
Italian Creativity Index (ICI)	1240	0.092	0.786	0.3896	0.1609
Per capita disposable income	1240	9521.712	20119.94	15124.4943	3131.56
Single	1240	0	1	0.1565	0.3634
Divorced	1240	0	1	0.1105	0.3136
Widow	1240	0	1	0.0387	0.1930
Female	1240	0	1	0.3089	0.4622
Schooling	1240	0	18	10.9944	3.6096

Table 2. Descriptive statistics

Mean happiness	
Education	
<= Mean	7.04
> Mean	7.38
Age	
<= Mean	7.03
> Mean	7.48
Sex	
Male	7.25
Female	7.14
ICI	
<= Mean	7.26
> Mean	7.12
Incombe	
<= Mean	7.12
> Mean	7.35

Most importantly, I argue that the *schooling years* variable also contains valuable information regarding people’s socio-economic aspirations and that, therefore, it can be adopted as a good predictor of their socio-economic expectations. On these grounds, and building on the idea that socio-economic aspirations are fuelled by schooling attainments above middle school (8 schooling years), in the estimation I include both schooling years and the squared term of the latter. Our expectations are that (a) schooling improves people’s skills and life satisfaction and that (b) the latter effect is non-monotonic due to the compensating effect, captured by the squared term, delivered by the impact of schooling on aspirations.

Table 3 –The Italian Creativity Index (Florida and Tinaglia, 2005)

Talent	<i>Creative class index</i>
	<i>Human capital index</i>
	<i>Number of researchers index</i>
Technology	<i>High-tech index</i>
	<i>Innovation index</i>
	<i>High-tech connectivity index</i>
Tolerance	<i>Diversity index</i>
	<i>Integration index</i>
	<i>Gay-tolerance index</i>

I also consider the impact of perceived environmental opportunities¹³ given by the index of creativity (ICI) and by the interaction between ICI and schooling: I assume that the latter variable also contains information about people’s aspirations. My expectation is that, the more the impact of ICI and of its interaction with schooling on life satisfaction generates stimuli in activities yielding intrinsic reward which do not drive up aspirations, the more positive it will prove. Conversely, if ICI substantially raises aspirations, even though indirectly, through schooling, it may have a negative impact on life satisfaction.

I also assume that gender affects the gap between perceived and actual opportunities and, thereby, life satisfaction. In particular, building on the evidence that women appear to be happier though less optimistic than men (Puri and Robinson, 2005) I expect that, women’s elasticity of aspirations with respect to perceived opportunities being weaker, they are less affected by the negative impact on experienced utility of unfulfilled expectations.

Finally, building on the available empirical evidence (Blanchflower and Oswald, 2007), I include both age and age squared in our estimation and I expect to find a *U-shaped* happiness-age relationship; the latter should be seen as an evidence of the impact of aspirations on people’s wellbeing over the life cycle. On these premises, I estimated the following models¹⁴:

¹³ I also unsuccessfully tried other, more standard measures of environmental opportunities at province level such as the unemployment rate and various index of physical and immaterial infrastructures taken by Unioncamere (2006).

¹⁴ I limit discussion to the model with the best fit and omit discussion of the preliminary regressions

(Model 1)

$$\text{Life satisfaction}_i = a_0 \text{Gender}_i + a_1 \text{Marital status}_i + a_2 \text{Age}_i + a_3 \text{Age}_i^2 + a_4 \text{Schooling}_i + a_5 \text{Schooling}_i^2 + a_6 \text{ICI}_{ji} + a_7 \text{Schooling}_i * \text{ICI}_{ji} + a_8 \text{Income}_i + \varepsilon_i$$

(Model 2)

$$\text{Life satisfaction}_i = a_0 \text{Gender}_i + a_1 \text{Marital status}_i + a_2 \text{Age}_i + a_3 \text{Age}_i^2 + a_4 \text{Schooling}_i + a_5 \text{Schooling}_i^2 + a_7 \text{Schooling}_i^2 * \text{ICI}_{ji} + a_8 \text{Income}_i + \varepsilon_i$$

Where a_4 , a_5 and a_7 are expected to capture, in addition to the effects of perceived opportunities, also the impact of the latter on aspirations and, then, on life satisfaction. Table 4 provides a résumé of the model's predictions.

Table 4 – Résumé of the model's prediction

Variable	Expected sign
<i>Gender</i>	+
<i>Separated/divorced</i>	-
<i>Widow</i>	-
<i>Single</i>	-
<i>Age</i>	-
<i>Age</i> ²	+
<i>Schooling</i>	+
<i>Schooling</i> ²	-
<i>Schooling*ICI</i>	(?)
<i>ICI</i>	(?,-)
<i>Income</i>	+

4.1. The results

The results¹⁵ of the ordered probit estimations of the determinants of life satisfaction are shown in Table 5. *Skills and environmental opportunities* both play a significant role. First, the skills acquired through education appear to exert a direct positive impact on life satisfaction up to an educational attainment which ranges, depending on the model selected and on the actual value of ICI, between 8 and 14 schooling years.

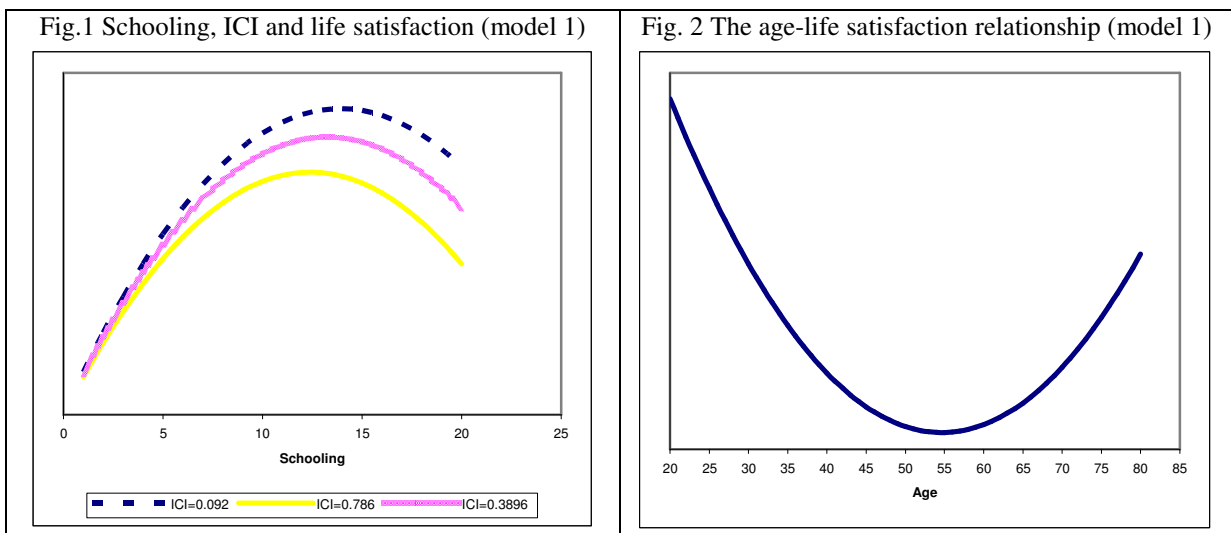
The direct positive effect of schooling on life satisfaction is partially offset by the negative effect of the squared term of schooling and by the interaction between schooling and ICI. Second, living in environments offering more stimulating opportunities does not seem to have a significant impact on life satisfaction. Conversely, the negative sign of the variable of interaction between environmental opportunities and schooling suggests that, for more educated people, environments offering better work and consumption opportunities may raise aspirations above real life chances.

¹⁵ I computed robust standard errors to account for the presence of the cluster variable ICI..

Table 5. Ordered probit regressions
Number of obs = 1240.

Wald chi2(11) = 123.83; Prob > chi2 = 0.0000 Log pseudolikelihood = -2227.009. Pseudo R ² = 0.0275				Wald chi2(10) = 216.67, Prob > chi2 = 0.0000 Log pseudo-likelihood = -2226.3233. Pseudo R ² = 0.0278			
Variable	Estimate	Robust Std. Error	Sig. (P> z)	Variable	Estimate	Robust Std. Error	Sig. (P> z)
Age	-.0654	.045	.011	Age	-.06526	.025783	.011
Single	-.4817	.0884224	.000	Single	-.46797	.85602	.000
Divorced	-.5978	.0955124	.000	Divorced	-.59579	.96502	.000
Widow	-.7423	.1596002	.000	Widow	-.74071	.168756	.000
Female	.1735	.0790468	.012	Female	.17882	.071423	.012
Schooling	.18277	.0470801	.000	Schooling	.17217	.048699	.000
Age ²	.00064	.0003132	.035	Age ²	.0006	.000286	.036
Schooling ²	-.00647	.0019674	.004	Schooling ²	-.00554	0.00210	.012
Incombe	.0000155	4.68e-06	.001	Income	.0000157	0.00004	.000
ICI	1.3192	.818833	.107	Schooling ² *ICI	-.002488	.001060	.019
Schooling*ICI	-.02863	.0526459	.074				

Hence, I find support for the idea that, for more educated people, socio-economic aspirations rise faster with schooling, than real life opportunities. The idea that the gap between aspirations and real life opportunities widens with education and environmental opportunities is illustrated in Figure 3. The latter idea is consistent with Easterlin (2001) and previous empirical evidence on the negative impact of education on job satisfaction discussed by Clark and Oswald (1996). Summing up, we may conclude that the *elasticity of aspirations with respect to people's skills increases with environmental opportunities*. More generally, *for more educated people, aspirations, i.e. perceived opportunities rise faster than actual opportunities*.



An alternative interpretation of this result is that systematic differences in socioeconomic rewards do not depend solely on people's skills but also on their unobservable abilities/talents. If socio-economic expectations are based on incomplete information about the actual sources of e.g.

wage differentials, the less talented or lucky may form biased education-driven expectations about what they deserve, and may experience frustration over unfulfilled expectations¹⁶.

To find further support for our preliminary results, I computed the standard deviation of income for individuals, respectively, below and above the mean schooling years and below and above the mean ICI, and I took it as a measure of the likelihood of frustration deriving from unfulfilled socioeconomic expectations. Not surprisingly, the standard deviation is much larger for the more educated individuals and for males. Most importantly, the standard deviation of income is larger for the more educated individuals living in more creative places whereas the opposite holds for the less educated individuals (Table 6).

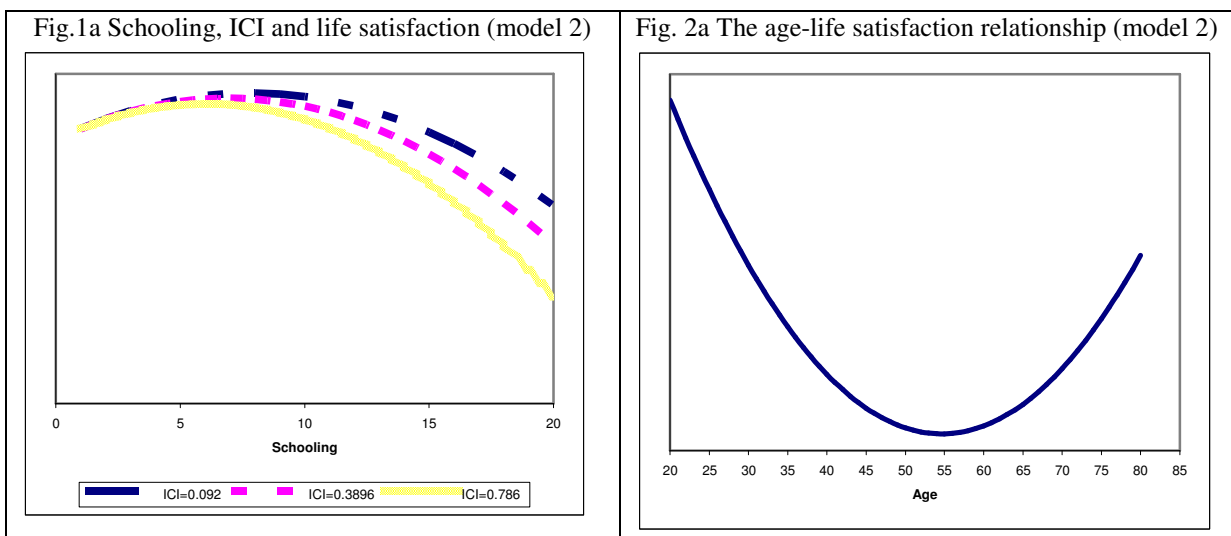
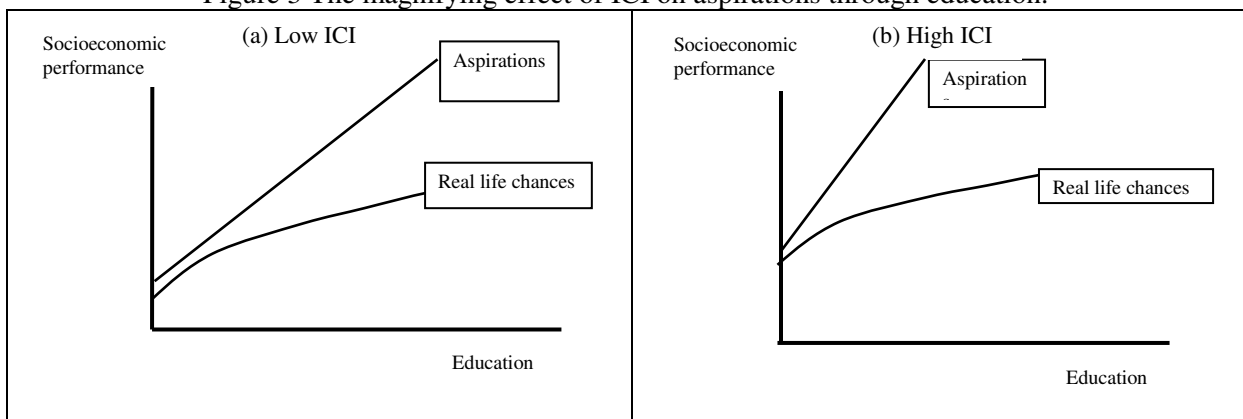


Figure 3 The magnifying effect of ICI on aspirations through education.



¹⁶Of course, one should register (??) we should find (??) we must also note (??) the opposite result for more talented and luckier people. We posit that, when loss aversion obtains, people’s hedonic adaptation to positive surprises is very rapid.

Table 6. Schooling, ICI and aspirations

	S.D of income
All	8244
Women	6535
Schooling below the mean	5709
Schooling above the mean	9582
Schooling above the mean and ICI above the mean	10739
Schooling above the mean and ICI below the mean	8592
Schooling below the mean and ICI above the mean	5272
Schooling above the mean and ICI below the mean	5920

Third, as expected, being female has a positive impact on life satisfaction. The latter finding is consistent with our interpretative framework and with empirical evidence showing that women are less optimistic than men; notably, on the latter grounds women should be expected to be less affected by the *EIPB*,

Fourth, life satisfaction shows the expected *U-shaped* relationship¹⁷ with age, with a minimum around 55 years in both models (Fig. 2 and 2a). This result is consistent with our assumptions and with the argument that people show an optimism bias (Easterlin, 2001), leading them to commit systematic errors in over-predicting their life satisfaction. In particular, one should reasonably expect the consequence of such errors to follow a typical pattern: at the beginning of adult life, errors in predictions reduce life satisfaction but are seen as random events. Soon, people begin to recognize that the latter events are a systematic component of their life; consequently, they experience increasing frustration over unfulfilled life expectations. Thereafter, around the age of 55, through hedonic adaptation, people appear to trim down their aspirations and adjust their expectations correspondingly, thereby also limiting frustration. In other words, older people seem to become wiser in assessing what their lives can deliver them¹⁸!

Our conjectures and preliminary results would imply that the *U-shaped* age-life satisfaction relationship is valid only for people experiencing frustration of their expectations. To test this hypothesis, in order to measure income aspirations, I estimated a *Mincerian* equation of the determinants of earnings based on four explanatory factors (Clark and Oswald, 1996): education, experience, gender and creativity at the province level (Table 7). The latter factor should capture the local labour market earnings opportunities¹⁹. I then generated the unbiased expectation of individual income (*EXy*) conditional on the latter factors.

¹⁷ Time and expectation are the major connections between “decision” and “experienced” utility or happiness.

¹⁸ The mechanisms underlying the building up of utility from memory and anticipation have been thoroughly investigated by psychologists and may play a significant role in this context: “The impact of memory and anticipation on current utility leads to a type of triple counting of experience. A single event can influence utility first through anticipation, then through direct experience, and finally through memory” (Elster and Loewenstein, 1992, p. 214).

¹⁹ It can be shown that it works better than other measures of the local economic conditions such as the unemployment rate or per capita disposable income.

Table 7. The estimated coefficients of the human capital earnings equation

	Coef.	Robust Std. Err.	t	P>t	Beta
Constant	7.577565	.1426862	53.11	0.000	.
Female	-.270596	.0299858	-9.02	0.000	-.2506118
Ici	.472876	.0874142	5.41	0.000	.1532671
Lnexp	.1994862	.0251118	7.94	0.000	.182087
Lnschooling	.5578472	.0408466	13.66	0.000	.3877251

Number of obs.=1235; F(4, 1230) = 68.06; Prob > F =0.0000; R-squared =0.2061; Root MSE=.44591

To test the hypothesis I split the sample according to the value of EF ($EF < 0$ and $EF \geq 0$) $EF =$ actual income – expected income²⁰. The means of the explanatory variables for the two sub samples are shown in Table 8. Not surprisingly, people whose income expectations are fulfilled, on average, earn more although they are less educated. Moreover, females are clearly over-represented within the latter group. To check whether the life-cycle pattern of satisfaction is related to age, I also carried out an ordered logit estimation of life satisfaction for the two samples and found that for $EF \geq 0$ the *U-shaped* age-life satisfaction relationship breaks down whereas it retains its shape for $EF < 0$ (table 9).

Finally, my conjectures would imply that the age-life satisfaction relationship is stronger for those people most affected by the *EIPB*, or in other words the more educated men. I tested this hypothesis by splitting the sample according to the value of *schooling* ($schooling < 12$ and ≥ 12) and gender and found that for *schooling years* ≥ 12 and for women the age-life satisfaction relationship breaks down²¹ (Table 9). Hence, it is evident that the *U-shaped* age-happiness relationship has a lot to do with people's education and income expectations: indeed, as I suggest, the two factors are connected through aspirations. Moreover, on these grounds, it can be argued that the positive association between life satisfaction and being female, generally found in the literature, and the lack of a significant age-life satisfaction relationship for females (table 9) have to do with the gender specific nature of the mechanisms of aspirations building-up²² (Sloane and Williams, 2000).

Table 8. Expectations' fulfilment

	$EF \geq 0$	$EF < 0$
Age	44.24	44.70
Income	20789	12593
Italian Creativity Index (ICI)	0.39	0.40
Schooling	10.80	11.31
Gender (Female)	35%	26%

²⁰ Indeed, this procedure does not consider the degree of fulfilment of people's expectations regarding life domains other than work, as well as non-pecuniary job rewards (e.g. job security, promotion prospects, actual work itself, relations with colleagues and the supervisor etc.). Moreover, I do not control for differences in abilities which might be responsible for differences in income. For our present purposes, to the extent that the latter abilities are not observable, this is not a major problem.

²¹ Data can be supplied by the author on requested.

²² On this interpretation, e.g. Clark (1997). Since females appear to be less optimistic than males, I argue that they may be less prone to build up education-induced aspirations inconsistent with real life chances. Moreover, for the same reason, women do not seem to experience the *U-shaped* life satisfaction-age pattern of adaptation found for males.

Table 9. The age-happiness relationship: breakdown by subsample (based on model 1; model 2 does not yield very different outcomes)

Sample	Age coefficient	Age ² coefficient
<i>All</i>	-.0654**	.00064**
<i>Males</i>	-.0706613**	.000695**
<i>Females</i>	Not significant	Not significant
<i>Schooling < 12</i>	Not significant	Not significant
<i>Schooling ≥ 12</i>	-.115356***	.001135***
<i>EF ≥ 0</i>	Not significant	Not significant
<i>EF < 0</i>	-.130588***	.0013172***

*** = Sig. 1%; ** = Sig. 5%; * = Sig. 10%.

5. Summary and conclusions

The idea that expanding work and consumption opportunities *always* increase people's wellbeing is widely accepted in economics but finds no support in psychology (Schwartz et al. 2002; Schwartz, 2000; Roese and Summerville, 2005). The question is that whereas an expanded set of choices is good for *decision utility* it may be not so for *experienced utility*. The results shown here suggest that life satisfaction depends greatly on how *experienced utility* compares with expectations on life satisfaction or *decision utility* (Kahneman et al., 1997; Clark and Oswald, 1997).

In this paper I show how and why education may generate a systematic gap, through aspirations, between decision and experienced utility. I develop an empirical model based on the assumption that subjective and objective opportunities play a central role in life satisfaction in that they affect both people's ability to express preferences and their socioeconomic aspirations. On these premises, I argue that better opportunities may depress life satisfaction if they raise aspirations above real life chances, and I provide empirical support to the idea that schooling is a main driver of both actual and perceived opportunities, i.e. aspirations.

A standard assumption in economics is that the preferences of a rational economic agent can be revealed by observing choices. If people's decision utility systematically differs from experienced utility but they do not know it, revealed preferences are not very useful to social scientists: why do people move to very *exciting* places or get secondary and tertiary education if the latter choices can depress their life satisfaction? The gap between socioeconomic expectations and outcomes can be an important source of unhappiness in modern, interconnected societies that offer an ever vaster range of work and consumption opportunities. The evidence on people's inability to predict their tastes (Kahnemann and Snell, 1992) and of their inclination to overrate systematically their future wellbeing (Easterlin, 2004) would suggest that the way aspirations and expectations are formed has an essential impact on human wellbeing, in all life domains and over the entire lifespan. Within this context, the *happiness paradox* should be interpreted as a symptom of the increasing gap between socioeconomic aspirations and real life chances.

This story suggests that educational choices should be a major concern of individuals aiming to maximise their experienced utility and not just their decision utility. In this respect, I argue that

education should be targeted to enhance those skills matching people's innate propensities and which may be needed to pursue activities yielding intrinsic rewards.

Social and family pressures may strengthen the impact of mechanisms leading to distort educational and occupational choices; in particular, in societies where the need for social recognition is strong and families play an important role in children's schooling decisions, choices based on extrinsic rewards may prevail over aspirations for intrinsic recompense. For these reasons, young people should be provided with professional, *unbiased* external advice when taking the latter choices.

Returns on education in terms of life satisfaction can be expected to vary in different educational systems and institutional environments. Until now, the idea that governments should financially support educational systems or that they should regulate their functioning has been widely accepted with the conviction that human capital is essential to technical progress and productivity growth. This instrumental view of education was justified when the priority was material happiness, but it now needs revising: in highly advanced countries the income-elasticity of life satisfaction is quite low, and education can improve wellbeing mostly by allowing access to superior decision-making technologies.

As a final methodological remark, the results illustrated here lend support to the idea discussed elsewhere (Easterlin, 2006; Di Tella, Haisken-De New and McCulloch, 2007; Oswald and Graham, 2006) that future research in this field should expand analysis of the construction of aspirations and of the mechanisms of hedonic adaptation in different life domains.

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