



UNIVERSITA' DEGLI STUDI DI TRENTO - DIPARTIMENTO DI ECONOMIA

THE HAPPINESS PARADOX: A FORMAL EXPLANATION FROM PSYCHO-ECONOMICS

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Discussion Paper No. 1, 2005

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The happiness paradox:

a formal explanation from psycho-economics

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Abstract

The first aim of the paper is to provide a formal explanation for the happiness paradox, i.e. the fact that well-being in the advanced countries does not increase over time, or even declines, in spite of the rising trend of income, while people continue to strive for money. The second aim is to propose an economic approach which draws from psychology crucial arguments. Psychology, contrary to economics, stresses the crucial importance of close personal relationships as non-marketed goods for well-being by arguing that relatedness is a basic human need. Unfortunately, various indices show that close personal relationships in the advanced countries are deteriorating, which may reduce overall individual well-being. But why do people persist in devoting time and effort to making money rather than to improving their relationships? Authoritative psychologists argue that non-satisfaction of the need for relatedness during infancy makes a significant proportion of people less able to feel, to understand and to enjoy others, as well as being less affectively disposed towards others. This reaction originates outside consciousness, and it impairs the capacity to perceive signals from others and from the self to maximise well-being, whereas signals from the product market become relatively more attractive. This explains both the race for greater consumption and the deterioration of close personal relationships, and also, possibly, of overall individual well-being.

JEL Code: A12, D01, I31, J22, O40

Keywords: happiness, well-being, relational goods, personal relationships, attachment, unconscious

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0. Introduction

The paper has two main aims: to explain the happiness paradox, and to propose an economic approach which draws from psychology crucial arguments.

By the ‘happiness paradox’ is meant a phenomenon that has become apparent in the US and other advanced countries during recent decades. Well-being, as measured by a self-reported rating of one’s happiness, or by other objective indices of mental health, does not improve, or it even deteriorates, whilst income per head, which is the main proxy for material well-being, displays a distinct rising trend. The paradox is reinforced by the fact that people still strive to earn more income by working harder and for longer hours. These facts are paradoxical because economists would expect higher income to mean greater well-being, and that more wealth would enable people to exploit technical progress in order to reduce their working time.

In order to explain the paradox, this paper both adopts the economic approach, which assumes that individuals attempt to maximise their well-being under resources constraints, and draws crucial arguments from social, clinical, and cognitive psychology. This deep integration between economics and psychology can be coined with the term *psycho-economics*. In this paper, in fact, economics does not simply borrow stylised facts on the human decision process from psychology and use them as starting hypotheses for analysis of the economic consequences, as ‘behavioural economics’ attempts to do. Psychology will also contribute to explanation of the origin of the human decision process, and of the motivations, even outside consciousness, that underly it (Pugno 1994). Psycho-economics thus undermines the representation of *homo economicus*, but it also opens the way for new research that combines depth of understanding with viable prescriptions.¹

The happiness paradox will be explained on the assumption that well-being is due not only to income and consumption, as economists tend to assume, but also to close personal relationships, as emphasised by social, developmental, and clinical psychology. Because there is various evidence for a worrying deterioration on the quality of the relationships within the family and within social community, improvements in material living standards may not be sufficient to increase overall well-being.

The novelty for economics is that interpersonal relationships are important not simply because they are instrumental for the division of labour, and for goods exchange, but especially because they are the final goal for well-being. This extension of economic analysis, however, poses new problems as to how these particular goods that arise within human relationships should be treated.

¹ This is a different line of inquiry from attempts to ground or extend economic micro-foundation on evolutionary biology (see, e.g., Robson 2001; Cosmides and Tooby 1994), or on more philosophical bases (e.g. Harsanyi 1997).

On this point, another crucial contribution of psychology, with the help of neuroscience, is its finding that human motivations arise largely unintentionally through emotions, affects, and feelings, especially where relationships with others are concerned. Furthermore, an authoritative strand in the psychology literature argues that affects toward the others display patterns shaped by primary relationships during infancy. Disappointments in primary and subsequent relationships may explain both people's vulnerability to the impelling materialism of modern social models, and their profound dissatisfaction. These arguments will solve the paradox, but they will also highlight a case of 'rationality failure'.

The paper is organised as follows: Section 1 shows the empirical relevance of the well-being paradox; Section 2 outlines the two main explanations for the paradox and indicates their shortcomings; Section 3 provides the alternative explanation by referring each single argument to the appropriate economic and psychology literature; Section 4 sets out the formal model; Section 5 draws the conclusions, while the appendix provides the relevant proofs.

1. The empirical relevance of the well-being paradox

The happiness paradox was first raised by Easterlin (1974). By measuring happiness by means of self-reported ratings on subjective well-being (SWB), he shows that in the US happiness has not exhibited a definite rising trend since WWII, whereas real income per head has instead done so.² The evidence from recent econometric studies reinforces the paradox and makes it even more puzzling. In fact, the trend of SWB between the mid-1970s and the mid-1990s in the US is clearly *downwards*, and the same pattern emerges for Belgium and for the young component of the population of the UK (Blanchflower-Oswald 2004:1364 and 1368; Kenny 1999:14; Di Tella et al. 2003:817 and 814). This strengthening of the paradox is not emphasised by the literature, although the SWB index has been successfully tested for reliability and validity by various methods (see Blanchflower-Oswald 2004 and Myers-Diener 1995 for references).

Easterlin's finding of no significant trend of SWB has been recently confirmed for the EU and for many European member-states (Kenny 1999:14; Blanchflower-Oswald 2004:1368; Di Tella et al. 2003:817).³ Japan has also been often cited as a striking case, because real income per head rose sixfold in that country between 1958 and 1991, while the

² He also shows that SWB and real income per head are not correlated in a cross-section of developed countries in the 1960s.

³ The time-series study by Di Tella et al. (2003) finds a significant positive correlation between SWB and *current* income per head but does not furnish safe results regarding their long-run association.

proportion of people rating themselves as ‘very happy’ did not seem to change over the same period (Frey-Stutzer 2002:77).⁴

The strong version of the paradox is also supported by other well-known facts, like the recent increase in mental depression, which has been tested as strictly inversely correlated with SWB (van Hemert et al. 2002; Abbey-Andrews 1986). Several studies show that depression has significantly *increased* in the US and other major developed countries since WWII, sometimes specifying that the phenomenon recurs across generations (Klerman 1988; 1993; Lavori et al. 1993; Olfson et al 2002; Rutter-Smith 1995; Lane 2000:347-8).⁵ Particularly worrying is the rise in other mental sufferings among children and adolescents as evidenced by the threefold increase in their psychotropic medication, and in particular in treatment of Attention Deficit Hyperactivity Disorder between 1987 and 1996 in the US.⁶ Worrying rises in the incidence of “pervasive developmental disorder”, depression, and suicides among young people have also been found in the UK (Fombonne 1998; Fombonne et al. 2003).

An even more dramatic index of declining well-being in various countries is the suicide rate. Strictly speaking, this concerns only a small amount of the population, but it may represent the deeper-lying malaise of a larger fraction of it, insofar as suicide may be attempted or even seriously considered but not committed (Oswald 1997). The suicide rate *increased* for the US, the EU and Japan from the mid-1960s until the 1980s (Levi et al. 2003; Lane 2000:23). Lester-Yang’s (1997) survey of several studies shows that the correlation between income per head and suicide rates has been *positively* significant for the US since WWII, and for a cross-section of the European countries.⁷ The picture appears less bleak since the 1980s, in that suicide rate has declined for the US, Japan, and for many European countries. However, it has risen for Ireland and Spain (Levi et al. 2003; Chishti et al. 2003:111), and the suicide rate among adolescents and young adults has also risen in the US, and in the four major European countries (Putnam 2000:262; Lane 2000:23).

The striking difference in the dynamics of the suicide rate between age groups suggests that the deterioration of well-being takes place across successive generations, although the passage to adulthood may enable each generation to improve its well-being with more efficacy. This suggestion is stressed by Putnam (2000), who argues that civil

⁴ Cross-sectional studies confirm the paradox by showing that richer countries do not exhibit significantly greater SWB, once Gdp per head exceeds half that in the US in mid-1990s (Helliwell 2003; Kelly 1999; Inglehart and Klingemann 2000).

⁵ The survey by Diener and Seligman (2004) concludes that the increase in depression may be tenfold, and rules out that this is a measurement artefact.

⁶ The possible objection that greater income means that people can afford more medication seems contradicted by the fact that ADHD is more frequently treated among poorer groups (Olfson et al. 2002; 2003).

⁷ Similar findings have been obtained by Jungeilges and Kirchgassner (2002), and Huang (1996). Moreover, according to Lester and Yang, if suicide rates are regressed against the unemployment rate and income per head for European countries, only the latter variable emerges as positively significant.

engagement – which he shows to be closely correlated to well-being, at least in the US – clearly deteriorates across generations.⁸

By contrast, it is more doubtful that the passage to adulthood improves well-being. The econometric studies on SWB cited above show a clear U-shaped pattern of SWB with increasing age, with the trough at the age of 40.⁹ However, these studies are not based on panel data, and the U-shape may be due to a composition effect across different generations (Easterlin 2001:470; see also Pinquart 2001). If SWB is followed with the same cohorts, a constant or even declining trend emerges from ages 21-30 to 85-90 (Easterlin 2004:11179). This trend is confirmed by the data on suicide, which exhibits the highest rates among oldest people. In particular, in the US the suicide rate increased from 24.9 to 42.0 per 100,000 residents during the period 1990-1998, while among white widowed men the rate reached 84.0 (Institute of Medicine 2002).¹⁰

Technical progress and improved material well-being have not induced people to reduce their working time, as one would expect (see the often cited Keynes 1939). In the US both average annual and average weekly hours for men, but especially for women, have risen in the past two decades (Bluestone-Rose 2000). Since the late 1970s, overtime has increased as well (Golden 1998). However, Americans do not appear to be satisfied; rather they exhibit stress due to overwork (Schor 1992; Cross 1993; Jacobs-Gerson 1998). In the EU working time per employee has declined, mainly because of the introduction of regulations on the standard workday. However, the dynamics have decelerated in recent decades, and women's participation especially has greatly increased, so that the average rate of the working age population has increased as well (Lehndorff 2000). Canada seems to exhibit the same pattern (Osberg-Sharpe 1998). A detailed study conducted in Germany between 1985 and 1994 reveals that people, on average, would like to work less hours than they actually do. The study is interesting because it also reveals that the constraint on people's desire to work less does not lie in the labour market, since macroeconomic conditions worsened between the two years considered, and mobility towards greater participation by women and part-time jobs for all greatly increased. It seems to lie instead in familiar conditions at home (Merz 2002).

⁸ He efficaciously shows that the incidence of headaches, insomnia and indigestion was roughly the same in the late 1970s across age groups. Thereafter it was more pronounced, the younger the group (Putnam 2000:264). A similar finding applies to anxiety and neuroticism (Twenge 2000).

⁹ A less studied, but important issue is the decline of well-being during childhood and adolescence, i.e. before the age usually considered in the SWB surveys. It seems that this decline is significant, especially where satisfaction with the family is concerned (Nickerson and Nagle 2004).

¹⁰ The contrast with the U-shaped pattern may be resolved by distinguishing the cognitive component of SWB, which can cope with higher satisfaction with age, from the affective components of SWB, like depression, boredom and loneliness, which significantly point to a deterioration not only in the US, but also in Germany, Italy, and Spain (Campbell et al. 1976:36; Pinquart 2001).

2. The two main explanations for the paradox

The evidence of constant SWB while income per head has increased finds a straightforward explanation, although it is an unsatisfactory one, in the psychology literature. This explanation, which is called ‘set-point theory’, predicts a constant SWB in the long run on the basis of genetic and personality traits, whether these are dispositions towards happiness or unhappiness (Lykken-Tellegen 1996; Costa et al. 1987; Goldsmith-Campos 1986). In the short run, the level of SWB may be shocked by external events, like a rise in income, but the psychological mechanism of adaptation erodes the effect of the shock, thus bringing SWB to the long run level (Helson 1964; Brickman et al. 1978; Headey-Wearing 1989).

A number of criticisms have been levelled against this ‘theory’. Personality traits appear statistically to explain only a portion of the variance of SWB indices (Diener et al. 1999:279-80; Diener 1996). Adaptation seems to occur only slowly and even incompletely (Diener et al. 1999:280; Lucas et al. 2003; Easterlin 2004). Moreover, adaptation appears instead to conceal a strategy to substitute the goals to be pursued (Diener et al. 1999:284-5). Finally, personality traits are found to be significantly rising or decreasing from the age of 20 to the age of 60, while their variability during youth is usually viewed as natural (Srivastava et al. 2003).

In the economic literature, the most examined explanation for the paradox is the ‘comparison theory’, which also finds a good grounding in psychology (Michalos 1985; Inglehart 1990; Kahneman et al. 1997). Many authors base the explanation on comparison between aspirations and realisations. Easterlin provides the prime example of the use of this approach. He first assumes that SWB positively depends on current income and negatively depends on aspirations about future income, and that aspirations are based on past income. He then conjectures, and supports with some evidence, that “material aspirations change over life cycle roughly in proportion to income” (Easterlin 2001:473). As a result SWB may remain constant while income increases, and work effort is not discouraged. The same conclusions are reached in regard to the aspiration for increased consumption of positional goods, which are inherently scarce because of congestion or exclusion (Frank 1985; Hirsch 1976; Layard 1980; Ng 1978; Corneo-Jeanne 2001; Cooper et al. 2001).

However, both of the explanations favoured by economists appear implausible in the long run. In fact, in both cases, aspirations go systematically unrealised, so that some other explanation is needed to account for adjustment. Secondly, as Easterlin (2004) has recently acknowledged, SWB significantly depends on domains other than income and material concerns, like the family.¹¹ Why do individuals not adjust by changing their relative aspirations between different domains?

¹¹ Benabou and Tirole’s (2004) attempt to explain the paradox meets the first criticism but not the second. In fact, they argue that disappointments of optimistic beliefs vanish because individuals unconsciously repress

3. An alternative explanation and the supporting literature

Recently, interdisciplinary studies across psychology and economics have flourished (Rabin 1998; 2002; Elster 1998; Tirole 2002; Brocas-Carrillo 2003), but the research is still in its infancy. This paper attempts to take a step further in this direction by drawing arguments to explain the paradox from subfields in psychology and kindred disciplines almost entirely unexplored by economists. Hence, this section puts forward an alternative explanation by grounding its arguments on this extra-economic literature, while the next section will provide a formal explanation.

3.1 Defining relational goods

The key concept in explanation of the paradox is that of ‘relational goods’, which attempts to capture the most salient human aspects in the interaction among persons. The concept of relational goods has been used, at least cursorily, by a number of classical and modern economists (see the survey by Bruni 2000; Gui 2000; see also the collections of papers edited by Bruni-Porta 2005, and by Gui-Sugden 2005), but it is not always used with the same meaning. This paper starts with the seminal work by Uhlener (1989), who points out that “relational goods [...] arise as a function of a relationship with others [...] only by mutual agreement”, that they “cannot be acquired by an isolated individual”, and that they “are thus unlike private goods, which are enjoyed alone, and standard public goods, which can be enjoyed by any number. [They] are a subset of local public goods, as they enter two or more persons’ objective functions” (254).

Questions concerning the definition of relational goods are whether they are a characteristic of other market goods, whether they are an externality in consuming the other goods, whether they are distinct and instrumental for producing and exchanging other goods, or whether they are distinct and final, so that they directly enter people’s utility functions (Gui 2000). The bulk of the economic literature on relational goods regards them as depending on, or as instrumental for, market goods, doing so mainly in order to treat the problems of transaction costs and imperfect competition in a market economy. This paper instead assumes the last definition and considers relational goods to be distinct and final, i.e. as excluded from, and unrelated to, the production and exchange of market goods. Although this assumption excludes interesting problems like satisfaction with colleagues at work, it allows the analysis

unfavourable information, thus adjusting a ‘cognitive dissonance’. However, besides the curious conclusion that stagnant well-being is due to optimistic individuals, it is not clear why these individuals repeatedly repress information about the material world without shifting their attention to the domain of personal relationships.

to focus on relational goods both in parallel with and in contrast to other goods (see Ash 2000).

Relational goods can be treated in parallel to other usual goods, in that inputs, a technology, and an output can be distinguished (Gui 2000; 2005). Among the inputs, this paper considers time, and a disposition to personal relationships, which includes feeling, disclosure and responsiveness, and which may be regarded as an ability specific to each individual, and as mainly spontaneous. The technology of relational goods is the interaction among people when there is reciprocity in the pursuit of intimacy, i.e. a mutual perception of understanding, validation, and caring. The output can be partially observed by a third party as a complex set of communications between the persons involved in the relationship. Obviously, relational goods may have different effects on the well-being of the partners to a relationship.

Relational goods contrast with market goods because they cannot be marketed. The economic literature observes, in fact, that monetary incentives to produce relational goods destroy their quality, thus undermining demand for relational goods itself (Ng 1975; Gui 2000; see also Folbre-Nelson 2000). The psychology literature proposes a deep and far-reaching explanation for this contrast. Deci-Ryan (1985; 1991), who follow the humanistic/organismic tradition begun by Maslow (1954), maintain that relatedness with others is a basic and innate psychological need which drives human motivations. These motivations are intrinsic because the reward is satisfaction of the need itself. An external reward like a monetary incentive, which implies an exchange, is called an extrinsic motivation. A basic need cannot be satisfied by an external reward, unless the need is complementary with material utility. On the contrary, intrinsic motivations are often frustrated if extrinsic motivations are superimposed (Deci et al. 1999; Lane 1991:chs.11, 18; Frey 1997).

A further contrasting feature of relational goods particularly emphasised in this paper is their imperfect observability, especially by the people involved in the relationship in normal settings. Economists admit that relational goods may include an affective component (Gui 2005; Sugden 2002); nevertheless they assume that individuals can satisfactorily manage this component to maximise utility (Cauley-Sandler 1980; Glaeser et al. 2002). By contrast, some psychologists argue that human communication is largely non-verbal and unintentional (Watzlawick et al. 1967; DePaulo-Friedman 1998). Neuroscience has provided much evidence that emotions arise as spontaneous reactions by the body (Damasio 1994, 1999; LeDoux 1996, 2002),¹² and psychologists generally agree that emotions and affects are aroused mostly within personal relationships (Berscheid-Reis 1998:226). Moreover,

¹² Economists usually recommend that the emotions should be kept under control when dealing and deciding on market goods (Elster 1998). However, psychologists warn that this practice erodes well-being, with even psychological and physical damage (Ryan and Deci 2001:151).

neuroscience shows that information can be unconsciously acquired by humans (Zajonc 1980; Damasio 2003; Merikle-Daneman 2000), and psychologists stress the difficulty of forecasting future affective states (Gilbert-Driver Linn 2002; Loewenstein et al. 2003). Therefore, it seems safe to assume that relational goods are less observable and less predictable than market goods, which, in fact, can be more easily evaluated by individual and social learning. The final definitional question, as Gui (1996) points out, is whether relational goods have a stock or a flow dimension. Much literature, and this paper with it, adopts the flow dimension, although the related concept of social capital, which includes occasional relationships, has a stock dimension (Coleman 1988; Glaeser et al. 1999). However, disposition to personal relationships, which is an input to relational goods has a stock dimension, and, as explained below, it may be changed by relational goods themselves in a feedback. The possibility of a feedback has been already analysed by some studies and found not to be subject to choice by the individual (Gui 1996; van Dijk-van Winden 1997; Gui 1996; Antoci et al. 2001). In addition, this paper maintains that the disposition to personal relationships, besides relational goods, is imperfectly observable. This is confirmed by psychologists, who argue that affective states like sentiments and feelings, and even the self are only partially known by people (Schooler et al. 2003; Wilson-Dunn 2004; Lane 2000:285), and by neuroscientists, who argue that personal identity is built day by day on both conscious and unconscious bases (Boncinelli 2002; Damasio 1994, 1999; LeDoux 1996, 2002).

3.2 The importance of relational goods for happiness

The importance of personal relationships, especially of intimate ones, for well-being has been documented not only by several subfields of psychology but also by psychiatry, sociology and anthropology, and, very recently, by economics. The research methods employed for this purpose include surveys, experiments, cross-cultural comparisons, case studies (see the surveys by Argyle 1999; Diener et al. 1999; Myers 1993), and, finally, econometrics.

On surveying a wide spectrum of the psychology literature on almost 300 items, Baumeister-Leary (1995) conclude that the desire for interpersonal attachments is a fundamental human motivation. They do so on the following grounds. First, it is spontaneous, and it does not need material advantage; rather, people appear to devote much time and effort to fostering supportive relations with others. Secondly, interpersonal attachments exhibit diminishing returns (see also Lane 2000). Thirdly, “people strongly and generally resist the dissolution of relationships [...T]his resistance appears to go well beyond rational considerations of practical or material advantage”. Fourthly, deprivation of stable, good relations has been linked to a wide array of pathological and aversive consequences, from physical and mental illness to traffic accidents and suicides. Fifthly, attachment is essential because of its character of companionship and intimacy, which thus requires the qualities of

both relatedness and interaction. Simple affiliation and generic social support appear to be less important (see also Lane 2000:27). Sixthly, “the evidence for brain mechanisms is supportive but inadequate to prove innateness”.

These conclusions are important from an economic point of view, i.e. *vis-à-vis* market goods and material well-being. In fact, individuals appear intentionally to pursue personal relationships, and they employ time for this purpose. Personal relationships seem to be essential, and to function as imperfect substitutes for material goods, and similarly with diminishing returns. The quality of relationships appears crucial, but it is not pursued simply according to rational behaviour, nor simply according to an innate drive.

The importance of personal relationships has also been recently confirmed by various econometric studies. These show that marital status is the single most important (partial) correlate to self-reported SWB index (Blanchflower-Oswald 2004; Frey-Stutzer 2002; Helliwell 2003; Di Tella et al. 2003; Alesina et al. 2004).¹³ Easterlin (2004) further points out that the change in marital status is *not* completely eroded by adaptation. However, marital status is not the best proxy for evaluating the importance of personal relationships. In fact, “home life” seems an even stronger partial correlate, depriving marital status of significance (Radcliff 2001), while associationism, civic virtue, trust, democratic participation also capture significant positive effects of relationships on well-being (Helliwell 2003; Frey-Stutzer 2002).

3.3 The deterioration of relational goods for happiness

Unfortunately, several studies in sociology, psychology, and epimediology show that social and personal relationships have deteriorated in recent years for significant groups of people. All the indices used incur some bias, but the quantity and the variety of evidence for deterioration is substantial indeed.

Despite the increasing frequency of divorce, whose incidence shows no signs of diminishing even recently in the US (Glenn-Weaver 1998), the marriages that survive appear to be less happy (Lane 2000:24), especially if marital interaction and time spent together are considered across generations (Duane et al. 2002; Rogers-Amato 1997; Amato et al. 2003; Glenn-Weaver 1998). Increasing cohabitation, from 10% to 50% during 1972-94 in the US, which would imply that getting married is a more informed choice, appears instead to have worsened the quality of marriage, and to have destabilised it (see Kamp Dush et al. 2003, for the US; and Halli-Zimmer 1991, for Canada).

¹³ Blanchflower and Oswald (2004) tentatively estimate that, in the US, approximately 100,000 of 1990\$ extra per annum would be necessary to ‘compensate’ an individual for a marital separation, while the corresponding figure for an unemployed man is \$60,000. This relative importance is confirmed by cross country evidence (Helliwell 2003). The fact that marital status influences SWB rather than the other way around also finds some confirmation (Diener et al. 1999:290; Lamb et al. 2003).

Surprisingly, having children does not seem to improve a couple's well-being. On the contrary, the evidence available from econometric studies shows a significant, although small, negative correlation both for the US and for Europe (Alesina et al. 2004; Di Tella et al. 2003).

Within family tragedies occur with increasing frequency in the US. The homicide rate of babies aged 1 year or less rose from 51 per million-population in 1974-78 to 84 in 1995-99 (Pritchard-Butler 2003). Equally worrying are the data on increased homicides among adolescents (Merrick et al. 2003).

Sociologists observe that loneliness is a typical malaise of recent times (Bauman 2002), while psychologists point out that loneliness crucially correlates with suicide (Baumeister-Leary 1995), as well as with depression (Peplau-Perlman 1982; Weeks et al. 1980)

3.4 *The shift from relational goods to market goods*

This paper argues that the deterioration of relational goods induces people to shift their expectations from relational goods to market goods. This shift is confirmed by a large body of psychology and sociology literature that discusses the issue under the heading of 'materialism' (see the survey by Lane 2000:ch.8). For example, poll-surveys on the values expressed by successive cohorts of college freshmen in the US show a rise from about 40% in the late 1960s to 75% in the late 1990s of those who rated "being very well off financially" as a very important personal objective (Putnam 2000:260, 272-4; Lane 2000:154-7).

A specific stream in the psychology literature adduces ample empirical evidence on two effects of the orientation to materialism. The first effect is a worse disposition to relationships, less co-operation, and a lower quality of relationships (Kasser 2000; Kasser-Ryan 2001). The second effect is described thus by Ryan-Deci's (2001:153) survey: "people who place a strong value on wealth relative to goals such as close relationships, [and] personal growth [...] should show *lower* well-being" (emphasis added; see also Lane 2000:143 and ch.8),¹⁴ more depression, more anxiety, less vitality, and an even greater propensity for mental illness (see also Deci-Ryan 2000:321; Nickerson et al. 2003).¹⁵

3.5 *Is the shift to market goods a rational choice?*

All these results on deterioration and on the shift away from relational goods appear puzzling for economists, who predict that the utility dynamics of optimising agents do not

¹⁴ This result is confirmed even if controlled for income (Diener and Biswas-Diener 2002; Nickerson et al. 2003). Ryan and Deci (2001:153) explain this result by arguing that "placing too much priority on material goods [...] can distract from foci that would yield need fulfillment".

¹⁵ Ryan and Deci (2000) further maintain that external motivation can be internalised (i.e. perceived as emanating from the person himself), thus providing beneficial effects. Hence, external and intrinsic motivations appear complementary. However, introducing the concept of internalisation put the whole reasoning at risk of circularity.

point to decline unless they are forced to do so by market failures.¹⁶ A number of questions arise: why do people not learn to relate healthily within marriage and the family? why do they not pass this knowledge and ability on to future generations? why are they so vulnerable to past experiences in relationships, so attracted to material goods? why do they not devote more time and effort to preventing the deterioration of relational goods?

These questions suggest a problem of ‘rationality failure’, at least when decisions regard personal relationships. An increasing body of analysis in economics and cognitive psychology, often called ‘behavioural economics’, attempts to understand certain systematic discrepancies between the observed behaviours of individuals and their behaviours as predicted by the classical theory of rational choice (Camerer-Loewenstein 2004; Tirole 2002).¹⁷ A popular explanation for these discrepancies refers to ‘visceral factors’ like “hunger, thirst, sexual desire, moods and emotions, physical pain, and craving”, which typically affect humans, and which induce them to deviate from rational behaviour, and hence from utility maximisation (Loewenstein 1996:272; Gifford 2002).

This explanation, in its turn, refers to psychology studies on decisions, arguing that humans follow ‘two systems of thought’: rational/analytical, which is slow, controlled, and effortful; and experiential/affective, which is intuitive, fast, emotional, and effortless. In particular, the ‘affect heuristic’ is recognised as an efficient shortcut whereby stimuli are marked with an affect drive in order to take rapid decisions and behaviours (Epstein 1994; Slovic et al. 2002; Kahneman 2003).¹⁸

3.6 *Three different affective reactions*

The experiential/affective system, rather than the rational/analytical system, characterises personalities. Hence, ‘rationality failures’ are expected to differ among people by degree. Much psychology literature, from social through developmental to clinical, has studied stylisations of the affective characterisations of people. In particular, an authoritative stream of literature called the ‘attachment approach’, initiated by Bowlby (1969) and developed by Ainsworth et al. (1978) and others, not only proposes three styles of affective characterisation, especially regarding personal relationships, but also argues that these styles originate in infancy.

¹⁶ Some economists suggest a coordination failure due to negative externalities from the production and consumption of market goods toward non-market goods, like environmental and relational goods. Each individual attempts to restore her/his well-being by substituting non-market goods with market goods, thus triggering a vicious circle (Hirsch 1976; Bartolini and Bonatti 2002; 2004). See also Antoci et al. (2001); Ng and Wan (1993).

¹⁷ The classical definition of rationality includes *perception rationality*, i.e. the ability to form and update beliefs as probability judgments according to Bayesian rules, *preference rationality*, i.e. the knowledge of well-defined preferences, which accurately reflect the true costs and benefits of available options, and *process rationality*, i.e. the ability to maximise those preferences under resources constraint (McFadden 1999).

¹⁸ The two systems for decisions can find some confirmation in neuroscience (LeDoux 1996, 2002; Rolls 2000). The ‘affect heuristics’ appears consistent with Damasio’s (1994) ‘somatic marker’ hypothesis.

In this approach, by ‘attachment’ is meant an innate system that induces the infant to seek to establish communication with her/his caregivers on whom s/he is entirely dependent for satisfaction of her/his basic needs.¹⁹ The interaction between them reflects the caregivers’ availability and responsiveness. On this basis, the infant builds an ‘internal working model’ of relationships, i.e. expectations about the caregiver’s responsiveness, and the representation of self as (un)worthy of love and care. Neuroscientists observe that an infant’s brain is especially plastic, so that the attachment pattern may be viewed as a set of information, only partially accessible, correlated with neuronal connections (Siegel 1999, 2001).

Three main styles of attachment can be distinguished: ‘secure’, ‘preoccupied’ and ‘avoidant’, the latter two being ‘insecure’. ‘Secure’ attachment occurs when the caregivers are able to satisfy both the infant’s material and mental needs, especially the need for relatedness. Besides security in coping with external reality, the infant thus develops vitality, and the mindsight which enables her/him to understand people without the use of verbal language. Therefore, the infant’s internal working model built upon well-being in relatedness brings her/him to positive (*i*) expectation, (*ii*) feeling and understanding, (*iii*) consideration, (*iv*) and disposition to others. S/he can draw great well-being from relationships, while her/his vitality helps her/him overcome stressful events, thus to maintain the original style of attachment (this italic numbering will be maintained throughout the paper).

‘Preoccupied’ attachment occurs when the caregivers perform incoherent emotionality and hyperprotection, so that the infant is partially disappointed since her/his need for relatedness is unsatisfied by confused communication. The infant becomes dependent on the caregivers, short of mindsight, and anxious about new relationships. Therefore, her/his internal working model brings her/him to (*i*) a cautious expectation of others, i.e. mixed between unsatisfied needs and fear of disappointment, a reduced (*ii*) feeling and understanding, (*iii*) consideration, (*iv*) and disposition to others. S/he cannot draw significant well-being from relationships. A lack of vitality makes her/him vulnerable to stressful events, thus to maintain the original style of attachment.

‘Avoidant’ attachment occurs when the caregivers are unable adequately to feel and respond to the infant’s needs because they control emotionality in relationships. The infant is seriously disappointed, short of understanding, and learns to control emotionality. This induces the infant to ‘solve’ her/his insecurity by building an internal working model of (*i*) no expectation, (*ii*) reduced feeling and understanding, (*iii*) no consideration, (*iv*) and a reduced disposition to others. S/he rapidly learns not to base well-being on relationships and is thus

¹⁹ Fagioli’s (1971) ‘theory of birth’ is an alternative to that of innate attachment and needs. He argues that at birth the infant reacts to the striking contrast between previous foetal homeostasis and the new stimuli of material reality, by making this reality non-existent in his mind, and, at the same time, by creating a psychic self which may be confirmed, developed, or disappointed by subsequent human relationships.

unable to appreciate positive experiences with others,²⁰ which reinforces the original style of attachment.

Attachment styles may be maintained in adulthood by the above-mentioned stabilising mechanisms, which can be briefly reworded in economic jargon. The ‘secure’ person bases her/his prior belief on the probability of experiencing future rewarding relational goods on an ample positive information set, although acquired with incomplete awareness during infancy. Information updating is applied on a particular self-service basis: by selecting favourable close relationships, and by alleviating the effects of possible negative information through relating with others. The ‘preoccupied’ person maintains a negative but very uncertain prior belief about relational goods, since it is based on disappointed expectations and ambiguous information. S/he updates with a negative bias, and without the ability to collect information from favourable relationships. The ‘avoidant’ person maintains a definite negative prior belief about relational goods which is constrained by the particular self-commitment to avoid updating.

The attachment approach has been successfully tested for predictive power on adolescence and adulthood by using various methods (Kobak-Sceery 1988; Waters et al. 2000, and following articles; Mikulincer-Nachshon 1991; Tidwell et al. 1996; Mikulincer et al. 2001).²¹ It has also been controlled in the laboratory as dependent on relationships with the caregiver, not on the infant’s personality traits (Siegel 2001). Other tests on differentials in understanding, responsiveness, happiness, others’ positive feelings among ‘secure’, ‘preoccupied’, and ‘avoidant’ adults appear reassuring (Kafetsios-Nezleck 2002:725). Unfortunately, secure attachment is not very widespread: it seems to appear in about half of cases (Siegel 1999: 76; Kafetsios-Nezleck 2002).

Psychology and economic literature provide a variety of other evidence and theoretical arguments that are consistent with the attachment approach. On the particular self-serving updating pursued by ‘secure’ and/or ‘preoccupied’ types of persons see Seidlitz et al. (1997), Diener et al. (1999:282 and 285), Morris (1999), Rabin-Schrag (1999), Pugno (2005). On the blocked depressed condition of ‘preoccupied’ persons, see Argyle (1987:ch.2), and Lane (2000:157). On the rational choice anticipating disappointment like that of ‘avoidant’ persons, see Loomes-Sugden (1986), van Dijk et al. (2003). On the attempt to substitute for unsatisfactory personal relationships by consuming market goods see Richins (1994), Rindfleisch et al. (1997), Kasser-Ryan (2001), Kasser et al. (1995).²² Some evidence is also

²⁰ Fagioli (1971) argues that the drive to make disappointing others mentally non-existent also destroys the inner capacity for feeling, thus also disposition to others.

²¹ Also during adolescence the relationship with the parents may influence, usually reinforcing, the affective characterisation of individuals in a similar way to attachment during infancy (Steinberg 2001: 8-9; Nickerson and Nagle 2004).

²² “If people’s need for relatedness is substantially thwarted when they are young – Deci and Ryan (2000:249) argue – they might compensate by attempting to gain [...] sense of worth by [...] accumulating money or

provided the psychology literature that people react to person-related disappointment differently from the way in which they react to other disappointments. People in fact tend to react by avoiding experiences with others, rather than persisting in their behaviour (van Dijk-Zeelenberg 2002).

3.7 *The paradox explained*

From the preceding sections it can be argued that significant groups of people incur a ‘rationality failure’ because they tendentially reduce their expectations about relational goods with respect to market goods, but undergo detrimental effects on their well-being. The basic reason for this failure is the loss of the capacity to feel for and hence appreciate others as an unconscious reaction to inadequate primary relationships.²³ A particular kind of self-serving updating of information hinders the adjustment of the failure.

These arguments induce us to expect that a significant proportion of people experience deterioration in their well-being. But a complete explanation of the paradox should account for the decline, or at least the reduced growth, of average well-being *across successive generations*.

A suggestion in this regard is provided by several studies in sociology and psychology: the exposure of people to the market system and to social models encourages materialistic values (Lane 1991, 2000; Kasser et al. 2004; Putnam 2000). A notable example is television advertising, which is found to be positively related to children’s purchase requests, but also to family conflict, disappointment, and life dissatisfaction (Buijzen-Valkenburg 2003; Bybee et al. 1985). Even more worrisome is the finding that watching television during adolescence and early adulthood is significantly associated with subsequent aggressive acts against others (Johnson et al. 2002), and that violent video games have similar effects, together with a desensitisation to violence (Funk et al. 2004).

This suggestion would be unsatisfactory, especially from an economist’ point of view, if taken as the main explanation for the paradox. It is not clear, in fact, why individuals are so vulnerable to materialistic temptation, and to intolerance towards others, and why they do not learn that this drive induces them to make wrong choices. These questions on individuals’ vulnerability and on the success of the current materialistic social model can now find an answer in the previous analysis.

material possessions”. On the contrary, “in contexts characterised by a sense of secure relatedness [...] intrinsic motivations will be more likely to flourish” (235).

²³ Weinberger et al. (1979) find that ‘repressor’ individuals, i.e. those who report low anxiety but high defensiveness, are more stressed than ‘truly’ low-anxious individuals.

The affective characterisation of adults is also studied by the literature on personality traits, which finds that genetics plays only a partial role, that extraversion, relation with others, trust, and emotional stability are positively correlated with SWB, while repressive defensiveness exhibits a negative correlation (Cooper et al. 1998).

4. The formal model

This section sets out the model for explaining the well-being paradox. The arguments in Section 3 drawn from a large amount of literature are here distilled in formal analysis. Clear-cut assumptions will be made to concentrate on differences, e.g. relational goods versus market goods, or ‘secure’ versus ‘insecure’ people. Nevertheless, the model has a substantial structure, and it is able to determinate prediction.

The presentation of the model is divided among Section 4.1, where expectations and the utility function are assumed to be exogenous, Section 4.2, which introduces the personal disposition for relational goods, Section 4.3, which provides an explanation for the formation of expectations and for the change in the utility function, and Section 4.4, which is devoted to aggregation and overall dynamics.

4.1 *Young people and adults, market and relational goods*

Let us assume that the population of the economy is constant, and that at the beginning of each period, which discretely marks the time flow, births and deaths are the same in number. The life cycle of each individual is divided into two periods: ‘youth’, when the individual does not work, and ‘adulthood’, when s/he works for a labour income. Hence, if the size of population is N , on moving from one period to the next, the number of births, of passages from youth to adulthood, and of deaths is $0.5N$.

Each household consists of an adult and a youth; both of them can consume two goods with partially specific preferences. The first good is the only proper good produced by the economy, which will be called ‘market good’. The second one is called ‘relational good’, and it has been previously discussed. The two goods may be complementary or substitutes. Adults spend their labour income on their own consumption, and on consumption by the youth. During non-labour time they enjoy close personal relationships with a number of other people of all ages. Youths split their time between consuming the market good and enjoying relationships.

Formally, the utility function of the youth, which explains his/her well-being (U), is of the usual Ces-type:

$$(1) \quad U_y = \left[\alpha C_y^{\frac{\sigma_y-1}{\sigma_y}} + \beta R_y^{\frac{\sigma_y-1}{\sigma_y}} \right]^{\frac{\sigma_y}{\sigma_y-1}} \quad 0 < \alpha, \beta < 1 \quad \alpha + \beta = 1 \quad 0 < \sigma_y < 1$$

where C is the market good, R is the relational good. The subscript y refers the attached symbol to the youth. The generic i -th individual is implicitly referred to when not otherwise stated.

The youth's spending of time is described thus:

$$(2) \quad C_y = b l_y \quad b > 0$$

$$(3) \quad R_y = r_y H_y \quad r > 0$$

$$(4) \quad l_y + H_y = 1$$

where the unitary endowment of time is spent in consuming the market good (l_y), and enjoying personal relations (H_y). Note that the two activities are complementary ($\sigma_y < 1$). The two coefficients b and r are the consumption of the two goods per time unit respectively, and are taken to be exogenous in this section. In particular, r will be explained in the next section.

The adult's utility function has been kept similar to the youth's,²⁴ i.e.:

$$(5) \quad U_a = \left[\alpha C_a^{\frac{\sigma_a-1}{\sigma_a}} + \beta R_a^{\frac{\sigma_a-1}{\sigma_a}} \right]^{\frac{\sigma_a}{\sigma_a-1}} \quad \text{but} \quad 0 < \sigma_a < +\infty$$

where the subscript a denotes the adult, and where:

$$(6) \quad R_a = r_a H_a.$$

Households earn only labour income, and consume, so that the budget constraint is:

$$(7) \quad C_a + C_y \leq w$$

where w is the wage rate per adult in the competitive labour market.

The adult spends his/her time working and consuming (L), and enjoying personal relationships (H_a), so that:

$$(8) \quad L + H_a = 1$$

On the production side, the model is very simple, since the production function for the market good is in labour only, and with constant returns, so that:

$$(9) \quad C_a = A L_a \quad A > 0$$

$$(10) \quad C_y = A L_y$$

where L_a and L_y are the necessary labour performed by the adult to provide consumption for him/herself and for the youth respectively. Therefore:

$$(11) \quad L = L_a + L_y$$

This model can be viewed as an extension of the textbook model of labour/leisure choice, so that its conclusions can be contrasted accordingly. In the textbook labour/leisure model, technical progress, which allows wages to grow, has two notable effects: it yields greater consumption and greater overall utility for each individual; it also yields greater

²⁴ The adult's utility function does not comprise the benefit of having the child in order to avoid the complication of choice analysis on this account, although some discussion will be made of it below.

leisure (less labour input) if consumption and leisure are complementary. Income is thus a good proxy for well-being, since consumption and overall utility are positively correlated. However, the reduction in labour input is not a stylised fact (see Section 1). Therefore, complementarity between consumption and leisure is not a safe assumption.

The model in this section yields only slightly different conclusions, but it provides the necessary framework and qualifications for the following sections. It will first be solved for the youth, then for the adult, while study of the effects of technical progress and some comparative analysis will conclude the section.

Utility maximisation for the youth yields (the star stands for the solution value):

$$(12) \quad C_y^* = \frac{b}{1 + (b/r_y)^{1-\sigma_y} (\beta/\alpha)^{\sigma_y}}$$

$$(13) \quad R_y^* = \frac{r_y}{1 + (b/r_y)^{\sigma_y-1} (\beta/\alpha)^{-\sigma_y}}.$$

The youth's consumption requires $L_y^* = C_y^* / A$ labour from the adult. This enters the time constraint for the adult's maximisation, so that:

$$(14) \quad C_a^* = \frac{A(1 - L_y^*)}{1 + (A/r_a)^{1-\sigma_a} (\beta/\alpha)^{\sigma_a}}$$

$$(15) \quad R_a^* = \frac{r_a(1 - L_y^*)}{1 + (A/r_a)^{\sigma_a-1} (\beta/\alpha)^{-\sigma_a}}.$$

To study technical progress, let us represent it as a greater value of A , i.e. labour productivity per time unit worked, through successive periods, and let us assume that $b=A$. This means that technical progress allows the youth to benefit more from a given quantity of market goods. This induces her/him to demand more market goods (eq. 12), but it also allows her/him to benefit from more relational goods (eq. 13), given that the two types of goods are complementary. The effects of technical progress for the adult are less straightforward, since the indirect effects through the youth's utility must be considered. The first row of Table 1 exhibits the sign of the effects on the relevant variables.²⁵

The results appear as expected, insofar as technical progress positively affects C_a^* and U_a^* , and the effect on L^* and on R_a^* depends on the elasticity of substitution between market and relational goods. The induced reduction in the labour required for the youth's consumption strengthens the effects on C_a^* and on U_a^* , and makes the threshold value for σ_a , which divides the opposite signs of the effect, greater than 1.

²⁵ The derivations of the results of Table 1 can be requested from the author.

Table 1. Relationships between selected parameters and adults' labour, consumption, and utility.

	L^*	C_a^*	R_a^*	U_a^*
A	$-,+(a)$	$+$	$+,-(a)$	$+$
r_a	$+,0,-(b)$	$+,0,-(b)$	$+$	$+$
σ_a	$+(c)$	$+(c)$	$-(c)$	$+$

Notes: (a) if $\sigma_a \leq 1$ and $\sigma_a \gg 1$ respectively, (b) if $\sigma_a < 1$, $\sigma_a = 1$, and $\sigma_a > 1$ respectively, (c) if $\beta/\alpha < A/r_a$

Therefore, technical progress is beneficial for successive generations of both youths and adults, while the elasticity of substitution between the two goods is crucial to account for the positive or negative changes of labour and relational goods from one generation to the next. To clarify the role of the relational good and of the elasticity of substitution in the solutions, some comparative statics exercises considering r_a and σ_a follow. The sign of the relationships between these parameters and the solutions are shown in the other two rows of Table 1. The results for r_a are analogous to those for A . Perhaps more unexpectedly, σ_a is not only positively related to utility, but it is also positively related to consumption and labour, and negatively to relational goods if $\beta/\alpha < A/r_a$. The latter restriction will be assumed throughout the paper, since A tends to rise without bounds, while r_a will be studied as decreasing toward zero.

The various rows of Table 1 should be interpreted differently. Whereas A increases for all individuals through successive periods, r_a and σ_a will assume the same starting values for each generation of youth, and they change on passing to adulthood.

4.2 The experienced quality of the relational good, and personal disposition

The parameter r can be interpreted as the experienced quality of the relational good, since it measures the benefit per time unit provided by the relational good for the individual's utility. The quality of the relational goods experienced by an individual during one of the two periods of his/her life can be explained by means of the following function:

$$(15) \quad r = f(\mathbf{D})$$

where \mathbf{D} is a vector of n elements (D_i) representing the personal dispositions of a number of people who experience close relationships with the reference individual. The number n , which is assumed equal and constant for each individual, is a subset of the population, and it includes the individual him/herself.

Let us assume for simplicity that the personal disposition of adults assumes only two values: a minimum level, D^m , and a maximum one, D^M . By contrast, youths assume only one value, i.e. D^M .

The function f is positive and concave in all the elements, and it exhibits constant returns to scale. For simplicity sake we ignore the fact that the market good may determine r . However, marginal R is generally affected by the marginal amount of economic goods consumed by the individual through the complementarity/substitutability link between the two types of goods in the utility function.

Therefore, r can assume any value within a minimum level, which occurs when the dispositions of all the n individuals are at the minimum (\mathbf{D}^m), and a maximum level when all the n individuals are at the maximum (\mathbf{D}^M). Let us assume that f normalises r , so that its extreme values are in the neighbourhood of 0, and equal to 1 respectively, i.e.:

$$(15') \quad 0 \approx f(\mathbf{D}^m) \quad \text{where } \mathbf{D}^m \text{ consists of } n \text{ elements equal to } D^m$$

$$(15'') \quad 1 = f(\mathbf{D}^M) \quad \text{where } \mathbf{D}^M \text{ consists of } n \text{ elements equal to } D^M.$$

4.3 Disappointment, and the reactions of three groups of people

Let us distinguish between the experienced quality (r) from the *expected* quality of the relational good r^e . The analogous distinction is less relevant for the market good, since in this case the quality is objectively the same for everyone, and it is thus more easily evaluated through both own consumption and consumption by others. Relational goods reflect the creative aspect of people within relationships, which makes them special goods, and difficult to predict, as discussed in Section 3.

Over r^e the individual takes the decision on her/his time allocation, expecting a level of utility U^e . However, r^e may turn out to be different from r , and hence U^e is different from U , for the same individual in the same period.

Since youths are driven from infancy by the need for relatedness and have no previous experience to draw upon, then $r_y^e=1$. During youth, r_y is experienced within $]0,1]$, so that either a disappointment ($r_y^e > r_y$) or a confirmation ($r_y^e = r_y$) may occur. Let us also assume that different degrees of disappointment stimulate three different reactions by individuals, so that they can be collected in three groups.

Table 2 ranks the degrees of disappointment of three groups of individuals (I)-(III) who become adult according to two intermediate thresholds (s and S), and it accounts for four characterisations (i)-(iv) of their reaction which may remain outside consciousness. The reaction is characterised by the individual's (i) expectation r_a^e , (ii) feeling for and understanding of others (mindsight), (iii) consideration of others, insofar as this is captured by the parameter measuring the substitutability of relational goods with market goods σ_a , and

(iv) disposition to others ($D_{o,a}$). The Table follows the arguments and justifications of Section 3, where the ‘attachment’ approach was discussed.

The individual of group I, who reflects ‘secure’ attachment, experiences relationships during his youth with *little* disappointment, which s/he interprets as negligible, thus confirming his expectations. S/he thus reacts by maintaining his/her original (i) expectation, (ii) feeling and understanding, (iii) consideration, and (iv) disposition to others. During adulthood, this individual will be in equilibrium. In fact, since s/he is able to foresee others’ dispositions, s/he closely relates to people with D_a^M , so that his/her expectations are confirmed, since $r_a^e = r_a = 1$.²⁶ S/he regards the market good as complementary to the relational good, so that the greater consumption of market goods made possible by technical progress appears instrumental to better relationships.

Table 2. The three groups and their reactions to disappointment in relational goods

Group	Degree of disappointment	r_a^e (i)	Mindsight (ii)	σ_a (iii)	$D_{o,a}$ (iv)
I	$S < r_y \leq 1$	1	High	< 1	D_a^M
II	$s \leq r_y \leq S$	$r_a^e = r_y$	Low	$= 1$	D_a^m
III	$0 < r_y < s$	≈ 0	Low	> 1	D_a^n

The individual of group II, who reflects ‘preoccupied’ attachment, experiences *medium* disappointment, which he interprets as confusing. S/he thus (i) downwardly adjusts his/her expectation (r_a^e) towards the past experience of relational goods (r_y), (ii) becomes unable to feel human relationships accurately, (iii) cautiously reduces the consideration of relationships, fearing further disappointment, and also (iv) reduces his/her disposition to others. During adulthood, this individual experiences further disappointment because s/he is involved in relationships only with those people who have experienced medium or severe disappointment during youth (group II, and, as will be seen, group III), and who exhibit D_a^m , thus yielding $r_a^e > r_a \approx 0$. If the model allowed more periods for the adults, the individuals of group II would adjust r_a^e asymptotically.²⁷ The rise in σ_a may approach the case where market and relational goods are independent goods.

Finally, the individual of group III, who reflects ‘avoidant’ attachment, experiences *severe* disappointment, which s/he interprets as plainly contradicting her/his expectations.

²⁶ This result can also be obtained by assuming that little disappointment during youth allows the individual to develop such vitality as to interpret even greater disappointments during adulthood as negligible.

²⁷ If column (ii) and the underlying arguments were dropped, the conclusion would be the same on considering a sufficiently negative (and partially unaware) influence of reduced disposition on r .

S/he thus (i) minimises her/his original expectation, (ii) becomes unable to feel human relationships, (iii) reduces the consideration of relationships even dramatically, and also (iv) reduces her/his disposition to others. During adulthood, this individual experiences confirmation of her/his adjusted expectations, although regarded as unimportant. In fact, like the individuals of group II, s/he is involved in relationships only with those people who have experienced medium or severe disappointment during youth (groups II and III). Therefore, s/he experiences $r_a \approx 0$, which is what s/he has expected. Since s/he regards the market good as substituting well for the relational good, the greater consumption of market goods made possible by technical progress no longer appears instrumental to better relationships, but rather as an end in itself.

The experiences and reactions of individuals are thus captured by the level and the change of r and σ , which determine the level and the change of U and L . Table 3 collects all the results, drawing especially on Table 1 in Section 4.1, and on the Appendix.²⁸ The first row refers to youth, the second row to adult, the third row to the passage from youth to adulthood. Obviously, the superscripts I, II, III attach the symbols to the different groups.

Table 3. Synoptical table of the results.

$r_y^I > r_y^{II} > r_y^{III}$	$\sigma_y^I = \sigma_y^{II} = \sigma_y^{III} < 1$	$U_y^I > U_y^{II} > U_y^{III}$	
$1 = r_a^I > r_a^{II} = r_a^{III} \approx 0$	$\sigma_a^I < \sigma_a^{II} < \sigma_a^{III} > 1$	$U_a^I > U_a^{III} > U_a^{II}$	$L_a^I < L_a^{II} < L_a^{III}$
$r_y^I < r_a^I, r_y^{II} > r_a^{II}, r_y^{III} > r_a^{III}$	$\sigma_y^I = \sigma_a^I, \sigma_y^{II} < \sigma_a^{II}, \sigma_y^{III} < \sigma_a^{III}$	$U_y^I < U_a^I, U_y^{II} > U_a^{II}, U_y^{III} < U_a^{III}$	

The main results are that:

- group I yields the highest level of utility in both periods of the life cycle, and the smallest amount of working time;
- group II yields the lowest level of utility in adulthood, whereas group III yields the greatest amount of working time;
- on passing from youth to adulthood, group II exhibits a reduction of utility, whereas group III exhibits an increase of utility.²⁹

Therefore, in the aggregate, within the span of one generation, technical progress allows production and consumption of market goods to increase, while utility (or well-being) may increase or decrease. Market goods and relational goods may be largely independent, so that labour input may not change greatly. The model is thus able to explain the well-being paradox

²⁸ When the change of r_a is negative, and the change of σ_a is positive, the resulting change of U is ambiguous. Numerical simulations are employed in the Appendix to show the results.

²⁹ The change of utility from youth to adulthood is equally burdened for all groups by the additional labour required for youth's consumption in the household. This might account for the negative effect of children on well-being (see section 3.3).

within a generation of people, depending on the values of the parameter σ_a , and on the relative size of three groups.

4.4 *Aggregate dynamics through generations*

In order to explain the paradox in the long run, when generations of people succeed each other, the change in the relative sizes of three groups must be accounted for. The thresholds (s, S) clearly play a key role in determining the size of the groups, but a link between generations must be established. First, recall that r , and hence the degree of disappointment, depends on the proportion of D^M/D^m in the set of the n close relationships of each youth. Secondly, the proportion D^M/D^m in the population depends, in turn, on r and on S . Therefore, the sample distribution of D^M/D^m depends on the proportion D^M/D^m in the population, so that endogenous changes of the three groups across generations arise. These changes interact with exogenous productivity growth in determining the dynamics of well-being and of income. In fact, income growth depends not only on exogenous productivity growth, but also on labour time, which is governed by average σ_a , and hence on the group composition of population.

On all these dynamics, let us state the following propositions.

Proposition 1. *A level of S exists, i.e. S^* , such that the size of group I remains unchanged through periods, having kept n and N constant and sufficiently great. If $S_{t=1} > S^*$, where $t=1$ is the starting period, then the size of group I tends to zero in the subsequent periods. Income per head grows at a greater rate than productivity growth, although this difference disappears in the asymptotic steady state growth. If $S_{t=1} < S^*$, then the size of group I in the subsequent periods tends to the size of the adult population ($0.5N$). Income per head grows at a lesser rate than productivity growth, converging to an inferior asymptote of positive growth rate.*

See the Appendix for proof.

Proposition 2. *The threshold s fixes only the proportion of group III relative to group II, having kept n and N constant and sufficiently great.*

See the Appendix for proof.

Propositions 1 and 2 thus define the possibility of a constant composition of the population in the three groups over a long period of time, with S performing a key role. However, this “equilibrium composition of the population” is dynamically unstable. If S in the starting period is larger than the equilibrium level S^* , then group I tends to vanish, more economic goods are produced because of the greater propensity of groups II and III for these goods, economic growth rises because $\sigma_a > 1$ of group III. Consequently, aggregate utility declines and working time increases across generations of individuals at rates that depend on

s , on the level of σ_a of group III, and on the rate of technical progress. If S in the starting period is smaller than the equilibrium level S^* , then groups II and III tend to vanish, economic growth slightly decelerates, but aggregate utility increases and working time decreases. In this case technical progress contributes to aggregate utility growth through complementarity between the economic good and the relational good.

Group III, which appears to be more successful than group II in yielding greater utility, although at the cost of longer working hours, is not successful in the long run.

Therefore, the model is able to explain different possible patterns in the dynamics of income, well-being, and labour input depending on definite parameters. In particular S^* and, secondarily, s^* both make youths' vulnerability effective so that they fall into groups II and III, and determine the diffusion of this vulnerability in the population. It can thus be argued that S^* and s^* are able to capture the influence of those social forces that shape individuals' preferences and expectations, like materialistic social models, or the market system itself as the provision of extrinsic incentives which superimpose themselves on intrinsic motivations (see Section 3.1) (Bowles 1998).

5. Conclusions

This paper has proposed a new line of inquiry by employing crucial arguments from psychology within an economic approach, thus substantiating the term 'psycho-economics'. The opportunity to pursue this new kind of investigation comes from growing interest among economists in the happiness paradox. Recently, in fact, this paradox has turned the old question of 'why money does not buy happiness' into why human rationality allows well-being to *deteriorate* when affluence has freed the advanced countries from material necessities.

Two key arguments drawn from psychology, with the help of neuroscience and sociology, have been employed to solve the paradox. First, close personal relationships are most important for human well-being, and must play a central role in human life, while income appears to have a small although necessary role. Secondly, not only do emotions and affects arise spontaneously, basically within personal relationships, but also feeling for and understanding the feelings of others largely lie outside consciousness; they depend mainly on primary experiences during infancy with caregivers, and they may be partly lost if frustrated.

This paper has elaborated these arguments within the economic approach by including relational goods *vis-à-vis* market goods in the utility functions, and by assuming that satisfaction from relational goods depends on the affective disposition toward others. This kind of ability is characterised by feelings and emotions, so that it is only partially observable, and it can be lost if frustrated. Consequently, the satisfaction expected from relational goods may be disappointed without there being much possibility to learn, while market goods and

‘materialism’ become more appealing. Primary satisfaction of the relational goods during the first part of the life-cycle is thus vital to escape from the vicious circle of disappointments, and the shift toward market goods and intense work. By contrast, even a dramatic shift to materialism and hard work is only partially successful within one generation, and unsuccessful for a succession of generations.

This solution of the paradox also explains why other solutions appear partial or inadequate. The arguments that people strive for money in order to keep up with the Joneses, and that every advance in consumption is subject to habituation, become sound arguments for the long-run as well if the search for greater well-being in the more promising domain of personal relationships is frustrated. Regret at having opted for market goods is impeded, and ‘cognitive dissonance’ can be explained. Also the arguments based on the irresistible attractiveness of the materialistic social model become convincing if the vulnerability of people to this model is explained. Analogously, Scitovsky’s (1976) claim that the choice between goods for pleasure and goods for comfort is not sufficiently controlled by individuals can be explained. By contrast, apparently inadequate are arguments based on social capital, on trust, and on the particular disposition toward others often called altruism, when treated as completely self-managed assets.³⁰

In the model proposed the key variables for policy prescriptions are S^* and s^* , i.e. the conditioning of socio-economic environment and organisation made effective by the degree of people’s vulnerability (r_y). Changes in this environment and organisation to reduce S^* and s^* thus become urgently necessary to improve the long-run dynamics of well-being. Alternative models to the materialistic one should be offered, so that new attention is paid to people’s disposition to relatedness. For example, in child rearing and youth education, attention should be paid to teaching not only about the material world but also about aspects of limited observability like disappointment in personal relationships, and the ensuing reactions. This requires specialists, research, and, generally, resources. But the advanced economies tend to devote as many resources to the youngest part of the population as *homo economicus* would strictly prescribe. The outcome of this tendency can be predicted by the model if all individuals are ‘avoidant’ and belong to group III, which better captures the species *homines economici*. If this tendency is not changed, a bleak future awaits us: a marked definite decline of well-being, and more striving for money.

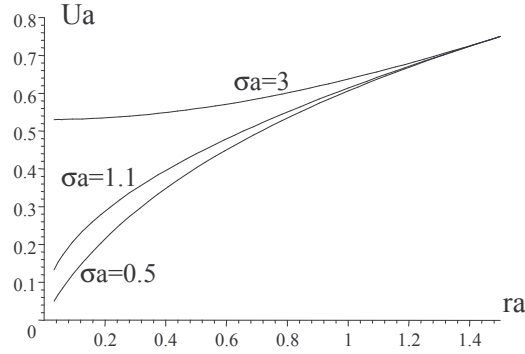
Appendix

Relationships between the parameters r_a , σ_a , and U_a^ .*

³⁰ The solution offered by psycho-economics allows us also to supersede the two original views on how to pursue happiness: on the one hand, Epicurean hedonism, as the purposeful but short-sighted search for bodily pleasure, on the other hand, Aristotelian eudaimonia, as the rational governance of the various relevant domains of human life. Here, neither simple physical drives nor rationality are useful guides for happiness.

The contemporaneous relationship between the parameters r_a , σ_a , and U_a^* can be seen from numerical simulations as depicted in the Figure 1, where r_a and U_a^* appear in the two axes. The curves are drawn for selected values of σ_a (0.5, 1.1, and 3 respectively), while the remaining parameters are set thus: $\alpha=0.5$, $A=1.5$.

Fig. 1. Relationship between r_a and U_a^* for selected values of σ_a



A negative relationship between U_a^* and r_a may emerge only if, for a diminishing r_a , σ_a at the same time takes very great values. This is the case of individuals of group III.

Proof of Proposition 1.

At the beginning of each period the population of size N consists of $0.5N$ youths with D_y^M and of $0.5N$ adults. Adults belong to group I with D_a^M or to groups II and III with D_a^m . Let us call p the share of the population with D^M , i.e. with D_y^M and D_a^M .

A youth will enter group I or group II+III of adults, depending on the share of people with D^M in the sample with whom he has a relationship. Let us call P this share, and $n>30$ the sample size, equal for each youth. Sampling is with repetition, since a youth can meet many other people, and the size of the population can be regarded as infinity in this case. Sample distribution of P is a binomial one with $(\mu_p=p, \sigma_p=\sqrt{p(1-p)/n})$.

Let us call P_S the share that makes $r_y=S$ in (15), so that a youth enters group I if $P>P_S$, he enters group II or III if $P\leq P_S$. The sample is sufficiently great to allow use of the standardised normal distribution $z_S=(P_S - p)/\sigma_S$ to calculate the cumulated probability Π , i.e. the region on the right of z_S under the curve of the distribution, where $P>P_S$.

Let us assume that N is sufficiently great for Π to approximate the share of youths in the population who enter group I. Therefore, in the following period the proportion p includes the new youth and those who entered group I, i.e. $p_{t=2}=0.5+\Pi_{t=1}$. It can be stated that P_S proves to be ‘too great’ or ‘too small’, i.e. the requirement to enter group I is too tight or too loose, whether it implies $p_{t=1}>p_{t=2}$ or $p_{t=1}<p_{t=2}$ respectively. Therefore, an equilibrium value P_S^* exists such that $p_{t=1}=p_{t=2}$, and correspondingly S^* exists. An equilibrium in the composition of the population can thus be defined. This equilibrium is unstable: if, e.g., $p_{t=1}>p_{t=2}$, then a greater z_S fixes $\Pi_{t=1}>\Pi_{t=2}$, so that $p_{t=2}>p_{t=3}$. Similar arguments apply to $p_{t=1}<p_{t=2}$, and for the subsequent periods.

The growth rate of income per head (γ) is the sum of the growth rate of productivity per time unit (γ_A) and of the change rate of the total time worked (in each period) (γ_{LT}). Whereas γ_A is assumed to be exogenous and positive, γ_{LT} depends on γ_A . In fact:

$$\gamma_{LT} = \frac{\sigma_a - 1}{1 + (A/r_a)^{\sigma_a - 1} (\beta_a/\alpha_a)^{-\sigma_a}} \gamma_A$$

If $\sigma_a > 1$, then $\gamma_{LT} > 0$; for $A \rightarrow \infty$, then $\gamma_{LT} \rightarrow 0$ and $\gamma \rightarrow \gamma_A$. If $\sigma_a = 1$, then $\gamma_{LT} = 0$. If $\sigma_a < 1$, then $\gamma_{LT} < 0$; for $A \rightarrow \infty$, then $\gamma \rightarrow \sigma_a \gamma_A$.

If $S_{=1} > S^*$, total working time tends to be performed only by group II, which exhibits $\sigma_a = 1$, and by group III, which exhibits $\sigma_a > 1$. Therefore, in this case: $\gamma > \gamma_A$. If $S_{=1} < S^*$, total working time tends to be performed only by group I, which exhibits $\sigma_a < 1$. Therefore, in this case: $\gamma < \gamma_A$.

Proof of Proposition 2.

In the previous proof, the threshold S and the current proportion of the population N with D^M determines the subsequent proportion of group I, which in turn affects the subsequent proportion of N with D^M . Similarly, the threshold s and the current proportion of the population with D^M determines the subsequent proportion of group III. However, the proportion of group III does not affect the subsequent proportion of N with D^M . Therefore, the sizes of groups III and II are determined by both s and S , and thus s determines only the size of group III relative to group II.

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