

## Life Dissatisfaction Over the Life Cycle

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### Abstract

The age profile of subjective well-being, often measured by life satisfaction and happiness, has recently attracted considerable attention. Yet, no study has provided its theoretical basis. To fill this gap, this study employs a bio-evolutionary framework on the premise that *dissatisfaction* works as a behavioral trigger, and examines how life satisfaction evolves over the life cycle. Theoretical considerations predict that the level of dissatisfaction due to the lack of income or an appropriate partner peaks in the reproductive period in which the lack of either had a serious impact on lifetime reproductive success in our evolutionary past. Theoretical considerations also indicate that the baseline level of dissatisfaction peaks in the reproductive period, reflecting the importance of behaviors on lifetime reproductive success in the same period. The empirical results support all the hypotheses. Regression analyses using the British Household Panel Survey show that the impact of income or spouse/partner situation on overall life satisfaction is greatest around thirty years of age, and that the baseline level of overall life satisfaction is U-shaped in age, with the lowest point in midlife. The results provide a new insight into the studies of age effects on behavioral patterns, in that the baseline level of life satisfaction represents the baseline level of desires and influences behaviors and the gross level of life satisfaction over the life cycle.

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## 1. Introduction

The life-cycle profile of subjective well-being, often measured by life satisfaction and happiness, has attracted considerable attention particularly since Clark and Oswald (1994) pointed to the U-shaped age profile of baseline happiness, i.e., the level of happiness after controlling for the individual's demographic and socio-economic background. Nonetheless, the empirical findings are mixed, some pointing to the U-shaped age profile and others denying the existence of such an age pattern (see, e.g., Frijters and Beatton 2012).

Various explanations have been proposed to account for these findings. On the side supporting the U-shaped age profile, Frey and Stutzer (2002) and Blanchflower and Oswald (2004) attributed the profile in their findings to unmet aspiration at young age and the adaptation to the unmet aspiration after midlife. In the psychological literature relating to subjective well-being, socioemotional selectivity theory supports the increasing part of the U-shaped profile, arguing that older people are better at managing emotions, particularly negative ones (e.g., Carstensen 2006). By contrast, the set point theory asserts that subjective well-being is virtually flat across ages because it returns to the genetically determined set point. For example, McCrae and Costa (1994) argued that personal traits, including happiness, are stable over the life course.

Turning to economics, the standard economic theory that employs the age-independent instantaneous utility function implicitly assumes that the baseline level of subjective well-being is flat across ages as long as instantaneous utility is regarded as the counterpart to subjective well-being (Blanchflower and Oswald 2008). Nevertheless, modifying assumptions leads to other predictions. For example, incorporating health into the economic framework, Wunder et al. (2013) argued that subjective well-being declines with age, especially in old age.

These arguments demonstrate that researchers are still far from reaching a consensus on this issue. In particular, the disagreement lies not only in the actual age profile but also in the theoretically predicted age profile of subjective well-being.

This paper tackles this issue. Specifically, this paper inquires into life satisfaction in a bio-evolutionary framework and empirically tests the derived hypotheses. The bio-evolutionary framework is used because evolutionary biology provides explanations of behaviors and characteristics at the evolutionary level and forms the ultimate basis of behavioral studies. The next section outlines the theoretical framework, Section 3 presents the main results, and Section 4 concludes.

## 2. Derivation of Hypotheses

We examine how dissatisfaction relates to life history, i.e., the biological life cycle, based on the premise that dissatisfaction provides behavioral incentives. While satisfaction and

dissatisfaction are the two sides of the same coin, we focus more on dissatisfaction as a behavioral indicator because we consider that, given a reference point, people behave differently to reduce dissatisfaction than to enhance satisfaction and that the former provides greater behavioral incentives.

Based on this idea, we obtain the following three hypotheses. The first and second hypotheses state that:

**H1.** The impact of the lack of income on (dis)satisfaction is greatest in the reproductive period.

**H2.** The impact of the lack of a satisfactory spouse/partner on (dis)satisfaction is greatest in the reproductive period.

Intuitively, these hypotheses arise because the lack of either had a greatest impact on lifetime reproductive success in the reproductive period in our evolutionary past. The values of resources and a spouse/partner need not be constant over the life course. The third hypothesis states that:

**H3.** The baseline level of overall satisfaction bottoms out in the reproductive period.

This reflects the importance of behaviors in the reproductive period on lifetime reproductive success.

### 3. Empirical Analyses

To test these hypotheses, we use the British Household Panel Survey (University of Essex 2010). The data set covers 20 waves starting in 1991. The 19th wave of BHPS was integrated into the 2nd wave of Understanding Society. Among these waves, we use waves 6 to 10 and 12 to 18 for which the data on overall life satisfaction are available. Overall life satisfaction is measured with the question, “How dissatisfied or satisfied are you with your life overall?” The answer takes a value between 1, not satisfied at all, and 7, completely satisfied.

With these data, we examine how regression coefficients of income and spouse/partner situation (marital status) change over the life history. Specifically, we divide observations to the adolescent (ages 16-20), early reproductive (ages 21-40), late reproductive (ages 41-60), and post-reproductive (ages 61 and above) periods.

With respect to the regression method, we follow previous studies that treat satisfaction levels cardinal and that apply the ordinary least squared (OLS) method with fixed individual effects. Ferrer-i-Carbonell and Frijters (2004) has demonstrated that “assuming ordinality or cardinality of happiness scores makes little difference, whilst allowing for fixed-effects does change results substantially.”

To be more specific, we apply the following two regression models. The first model regresses overall life satisfaction on domain-specific satisfaction for each life-history phase. The second model regresses overall life satisfaction on income and marital status, controlling for the individual’s demographic and socio-economic conditions. Life-history dummies and interaction

terms are included in order to assess how the impact of income, the impact of spouse/partner situation, and baseline satisfaction change over the life history. Here, we report the results of the second model while both models yield the consistent results.

Table 1 presents these results. Eqs. (1) and (2) respectively show the results with household-size *non-adjusted* and *adjusted* incomes, both supporting Hypotheses 1, 2, and 3. With respect to Hypotheses 1, the results show that the coefficient of income is significantly positive in the early reproductive period in Eq. (1) and in both the early and late reproductive periods in Eq. (2), all at the 1% level. In contrast, the coefficients become insignificant in other life-history periods. These results demonstrate that the impact of income on overall life (dis)satisfaction peaks in the reproductive period.

As for Hypotheses 2, Eqs. (1) and (2) show that the coefficients of being married are significant at least at the 5% level from the adolescent to late-reproductive periods, and turn insignificant in the post-reproductive period. The impact of being married is greatest in the early reproductive period, followed by the late reproductive period.

Regarding Hypotheses 3, the results demonstrate that life satisfaction is *ceteris paribus* lowest in the early reproductive period and increases thereafter. In Eq (1), the early reproductive period being the reference group, the dummies for the late reproductive and post-reproductive periods are significantly positive at the 10% and 1% levels respectively. In Eq. (2), the dummy for the post-reproductive period is significantly positive at the 5% level. Even in other periods in which the coefficients are insignificant, they are all positive.

Regressing the same regression models with balanced panel yields similar results whereas the results become less significant (Eqs. 3 and 4). Furthermore, regressing the same regression models subdividing observations into five-year age groups yields consistent results. In particular, the age profile of life satisfaction becomes U-shaped while replicating the finding in Frijters and Beaton (2012) that, without controlling for the age-dependency of income and spouse/partner situation, life satisfaction is flat in young and middle ages.

#### 4. Concluding Remarks

A question on the interpretation of the baseline level of overall life satisfaction remains. As Easterlin (2006) pointed out, baseline satisfaction is not necessarily suitable for comparing well-being across different age groups because many conditions that affect subjective well-being, such as income, marital status, and health condition, are age-dependent. For example, people get less healthy as they age, and consequently, comparing life satisfaction across different ages controlling for health condition, as is done in this paper, would mean asking a hypothetical question of whether people get more, or less, satisfied with age without taking into consideration that they become less healthy with age.

Table 1: Regression Results (Dependent Variable: Overall Life Satisfaction)

Panel	(1)	(2)	(3)	(4)
Income	unbalanced hhs-nonadjusted	unbalanced hhs-adjusted	balanced hhs-nonadjusted	balanced hhs-adjusted
Income (16-20)	0.0160 (0.0142)	0.0213 (0.0187)	0.0249 (0.0422)	0.0608 (0.0738)
Income (21-40)	0.0247*** (0.00957)	0.0422*** (0.0119)	0.0374** (0.0188)	0.0638*** (0.0239)
Income (41-60)	0.00178 (0.0109)	0.0374*** (0.0135)	-0.00451 (0.0187)	0.0450* (0.0259)
Income (61 and above)	-0.0162 (0.0152)	0.00591 (0.0173)	-0.0225 (0.0266)	0.00949 (0.0328)
Marital status (ref: never married)				
married (16-20)	0.117** (0.0490)	0.141*** (0.0535)	-0.00241 (0.129)	-0.0420 (0.179)
married (21-40)	0.205*** (0.0203)	0.194*** (0.0233)	0.193*** (0.0376)	0.148*** (0.0506)
married (41-60)	0.143*** (0.0508)	0.141** (0.0558)	0.102 (0.0886)	-0.0255 (0.112)
married (61 and above)	0.116 (0.0855)	0.0932 (0.0897)	0.186 (0.155)	0.147 (0.166)
separated (16-20)	-0.0530 (0.268)	-0.0513 (0.291)		
separated (21-40)	-0.186*** (0.0398)	-0.194*** (0.0440)	-0.230*** (0.0688)	-0.297*** (0.0928)
separated (41-60)	-0.104* (0.0576)	-0.0836 (0.0632)	-0.0964 (0.0994)	-0.286** (0.128)
separated (61 and above)	-0.201** (0.0898)	-0.221** (0.0950)	-0.0595 (0.166)	-0.169 (0.184)
Life history phase (ref: early reproductive)				
adolescent	0.195 (0.168)	0.292 (0.213)	0.267 (0.458)	0.111 (0.750)
late reproductive	0.259* (0.146)	0.0631 (0.176)	0.470* (0.252)	0.306 (0.322)
post-reproductive	0.547*** (0.193)	0.534** (0.225)	0.602* (0.346)	0.544 (0.428)
Observations	153,905	136,129	45,972	33,744
R-squared	0.021	0.021	0.024	0.023

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . The other control variables are education, number of children, economic activity, health status, home ownership, relative income, and wave dummies. Hhs-nonadjusted income is household annual income deflated by CPI, and hhs-adjusted income is household annual income, equivalised using the McClements 'before housing costs' scale, and adjusted for the prices of the reference month (Bardasi et al. 2012).

At this point, the present study provides a new insight. The baseline level of satisfaction, or more intuitively, the baseline level of dissatisfaction, represents the baseline level of desires that affects both behaviors and gross subjective well-being over the life cycle. For example, people become more dissatisfied and have greater desires for income and a reproductive partner at around thirty years of age. These desires prompt behaviors that aim at obtaining a higher income and a suitable partner, and increase the chance of successfully achieving these aims, raising life satisfaction at the gross level.

This argument supports Easterlin's view that comparing overall life satisfaction across different ages with the ceteris paribus assumption can potentially be misleading. However,

studying baseline satisfaction should not be deemed as unimportant. For example, from a policy-making perspective, the present study can point to the potential inadequacy of policy interventions that aim to raise subjective well-being. Policies targeted for compensating low baseline satisfaction of young adults, in particular, would distort behavioral incentives and potentially result in lowering their gross subjective well-being. Studying baseline satisfaction contributes to our understanding of behaviors and subjective well-being over the life cycle.

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