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What Makes a Child Happy? The Link between Family Income, Social Networks and Subjective Well-being in Vietnam

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Ngoc P. Nguyen



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Abstract

Using cross-sectional data from the Young Lives survey for a cohort of 12-year-old children in Vietnam, we find that children from ethnic minority and poor households have lower subjective well-being, on average, than those from ethnic majority and non-poor households. Absolute income is positively correlated with subjective well-being but no longer is significant once relative income is controlled for. There is some evidence that income-happiness is an inverted U-shape relationship, which means that there are diminishing returns to income. In addition, other variables such as caregiver's happiness, father's education and nutrition status as well as some social network variables are significantly correlated with a child's happiness.

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The Author

Ngoc Nguyen has a PhD from the University of Oxford.

About Young Lives

Young Lives is an international study of childhood poverty, following the lives of 12,000 children in 4 countries (Ethiopia, India, Peru and Vietnam) over 15 years. www.younglives.org.uk

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1. Introduction

Many studies on happiness in economic literature often focus on explaining the determinants of an adult's happiness. When we try to answer the question of what makes a child happy, many explanatory variables employed in studies of an adult's happiness, such as unemployment, marriage, divorce, sex, race, or working hours (Blanchflower and Oswald 2004), are no longer suitable to explain the determinants of a child's happiness. For example, what matters to a child is the family's financial situation rather than his/her own. If the child is enrolled at school, then variables such as friends, social inclusion and educational achievement play important roles in the child's life.

The topic of child subjective well-being has been explored widely in the psychology and sociology literature, but not so much in economic literature. The reason for this, partly, is due to the lack of data measuring children's subjective well-being directly. In contrast, there are many datasets that measure adult's subjective well-being/happiness/life satisfaction¹ such as the World Database of Happiness or the Eurobarometer survey on life satisfaction.

This paper aims to explore an under-researched area on the determinants of children's subjective well-being using longitudinal data from the Young Lives study for a sample of 1,000 children aged 12 years in Vietnam. The focus of the paper will be on using empirical evidence to explore answers to some main questions of interest, for example: Is it absolute or relative income that matters for a child's happiness? Does social inclusion matter for a child's happiness?

The paper is organised as follows. Section 2 reviews literature on subjective well-being and its determinants. Section 3 provides description of data from the Young Lives Round 2 survey for the 12-year-old cohort in Vietnam. Section 4 explains the estimation strategy. Section 5 discusses some preliminary results from regressions and finally, Section 6 concludes.

2. Literature review

Due to the lack of specific economic literature on the determinants of children's happiness, this section will focus on a few main debates in the adult happiness literature and discuss to what extent we can apply those in understanding children's happiness. First, we will discuss the concept and measurement of subjective well-being, then we will move on to the main debate in the literature on whether absolute or relative income matters for an individual's happiness, and finally, we will examine the literature for other determinants of happiness.

2.1 On concept and measurement of subjective well-being

The concept of subjective well-being or life satisfaction or happiness is perhaps closest to what welfare economists say they mean by utility, and is the concept employed in nearly all the recent studies by economists who have chosen to measure utility directly. However,

¹ These terms will be used interchangeably in this paper.

economists remain sceptical about using measures of subjectivist experience (e.g. captured by surveys) for a number of reasons.

One reason is that the concept of subjective well-being challenges the traditional axiomatic revealed-preference approach. Standard economic theory employs an 'objectivist' position based on observable choices made by individuals (Frey and Stutzer 2002). The basic assumption is that an increase in budget constraint allows the individual to buy more goods and increase his consumption, which eventually leads to an increase in his utility. Individual utility therefore only depends on tangible goods and services and leisure that the individual consumes. It is inferred from behaviour (or revealed preferences), and is in turn used to explain the choices made.

This axiomatic revealed-preference approach holds that the choices made provide *all* the information required to infer the utility of outcomes. The axiomatic approach is not only applied to derive individual utility, but also to measure social welfare. To do so, social welfare comparison is based on the consumption behaviour of households (Daniel Slesnick 1998; for a critical analysis Ng 1997, 2001).

The idea that utility is interdependent of other people's utility directly challenges the 'revealed preferences' approach, which depends on the assumption that people's preferences for goods and leisure are exogenously determined and hence that increases in supply will increase utility. If people change their preferences in response to what others have and want, as proposed by Duesenberry (1949), then one cannot reasonably infer that more goods and leisure, preferred at time t , will necessarily increase utility if acquired at time t .

Those who turn away from the revealed-preference approach to utility find reasons to support subjective well-being because (a) subjective well-being is a much broader concept than decision utility and (b) the concept of subjective happiness allows us to capture human well-being directly (Frey & Stutzer 2002). Subjective well-being is an attitude consisting of the two basic aspects of cognition and affect. 'Affect' is the label attached to moods and emotions. Affect reflects people's instant evaluation of the events that occur in their lives. The 'cognitive' component refers to the rational or intellectual aspects of subjective well-being. It is usually assessed with measures of satisfaction (McBride 2003)

Despite the scepticism over the use of subjective well-being, the overall conclusions made in literature are that subjective well-being is a meaningful concept in itself and that subjective well-being measures are meaningful measures of the concept (Easterlin 1974, 1995, 2001; Diener 1984; McBride 2001). The relevance of these errors, however, depends on the intended usage of the data. Often, the main use of a happiness measure is not to compare levels in an absolute sense but rather to seek to identify the determinants of happiness. For that purpose, it is neither necessary to assume that reported subjective well-being is cardinal measurable nor that it is interpersonally comparable. The subjective data are often treated as ordinal in econometric analyses so that higher reported subjective well-being reflects higher well-being of an individual.

The assumption of whether the subjective well-being data are cardinal or ordinal has an important implication for the econometric model used to analyse the determinants of happiness. Ferrer-i-Carbonell (2004) noted that psychologists and sociologists usually interpret happiness scores as cardinal and comparable across respondents, and thus run Ordinary Least Square (OLS) regressions on happiness and changes in happiness. Economists usually assume only ordinality and have mainly used ordered latent response

models². He also found little difference between running a simple OLS on the raw scores, or taking an ordered logit or probit model. That is, the sign of the coefficients are the same; whether a coefficient is significant is the same; and the trade-offs between variables are roughly the same, which means that indifference curves are similar. This is in line with Dunn's (1993) simulation findings that the difference between an OLS with measurement error and an ordered logit without measurement error is very small.

One important implication from this for our estimation strategy is that we treat the subjective well-being data as a discrete and ordinal dependent variable in our regressions, hence the appropriate econometric analysis for this type of dependent variable is to use an ordered latent-response model i.e. ordered logit or ordered probit model.

2.2 On whether absolute or relative income matters for happiness

In a 'well-established finding', it is observed that in the United States between 1946 and 1991, per-capita real income rose by a factor of 2.5 (from approximately \$11,000 to \$27,000 in 1996 US\$), but over the same period, happiness on average remained constant (Easterlin 2001, 1995; Blanchflower and Oswald 2000; Diener and Oishi 2000). This fact puzzles economists as most of them take it as a matter of course that higher income leads to higher happiness. A higher income expands the opportunity set of both individuals and countries i.e., more goods and services can be consumed. It therefore seems obvious that income and happiness go together. The empirical research on happiness has clearly established that at a given point in time, and within a particular country, persons with a higher income are happier.

There may be many different reasons why higher income does not simply translate into higher happiness. One explanation is that it is not the absolute level of income that matters most but rather one's position relative to other individuals. This idea of *relative income* is part of the more general aspiration level theory. The concepts of interdependent preferences due to comparisons with relevant others (Becker 1974; Frank 1985; and Pollak 1976) supplement ideas focussing on preference changes due to comparison with one's past consumption level or expected future income.

Easterlin (1974) provided support for Duesenberry's theory by showing that, in so far as income affects happiness at all, it is relative income – one's income relative to others in one's own country – and not absolute gains in income that make a difference. Based on the concept of aspirations, he argues that people with higher income are, on average, happier, but raising everybody's income does not increase everybody's happiness, because in comparison to others income has not improved. Easterlin (1974) concluded that 'money does not buy happiness' because people develop a standard of desirable income based on what others around them possess; if they are better off than this standard, they tend to be happier, and if they are worse off, they tend to be less happy.

The importance of relative income as a determinant of happiness is supported by findings which show the importance of relative judgements for happiness (Smith, Diener, and Wedell

2 See Ferrer-i-Carbonell (2004) for a more comprehensive review of literature and discussion on methodology.

This is the model most used by economists. The ordered probit model was used by Blanchflower and Oswald (2000a), Clark and Oswald (1994), Plug (1997), Ferrer-i-Carbonell (2002), Frey and Stutzer (1999; 2000), Hartog and Oosterbeek (1998), McBride (2001), Pradhan and Ravallion (2000), van Praag et al. (2003) and Wottiez and Theeuwes (1998). Ordered logit was the main model in, among others, Alesina et al. (2001), Blanchflower and Oswald (2000b), Theodossiou (1998), Winkelmann and Winkelmann (1998). The ordered latent-response model also seems to be the one most used in economic analyses of job satisfaction (Clark 1997; Levy-Garboua and Montmarquette 1997; Sousa-Poza and Sousa-Poza 2000; Hamermesh 2001) and health satisfaction (Cutler and Richardson 1997; Kerkhofs and Lindeboom 1995).

1989; Tversky and Griffin 1991). Evidence across developed and developing countries also points to a positive relationship between individual income and happiness within a society at a given point in time, while at the same time emphasising the relevance of the relative position in the income distribution rather than the absolute level of income (Graham and Pettinato 2001). A recent fascinating finding by Alesina, Di Tella, and MacCulloch (2001) suggests that there is a large negative and statistically significant effect from inequality on happiness in Europe, but not in the United States.

Some economists are strong proponents that it is relative, rather than absolute income, which matters for an individual's happiness (Morawetz 1977; Easterlin 2001; Blanchflower and Oswald 2004; Layard 2005). Using US and UK data, Blanchflower and Oswald (2004) found that relative income has some explanatory power in a happiness equation even when absolute income is held constant. In particular, the relativity effect is nearly twice as large at the high end of the income distribution, suggesting that maybe when people make relative-income comparisons, they look primarily upward rather than downward. Layard (2005) also argues that it is the change in income rather than income itself that affects happiness – unless you are very poor. Easterlin (2001) found that individual well-being is roughly the same across poor countries and rich countries and over a lifetime. The author suggests that we should think of people as getting utility from a comparison of themselves with others close to them i.e., happiness is relative.

The evidence on whether absolute or relative income matters for happiness is, therefore, not conclusive. In our study, since most of the children do not earn income directly (97 per cent of the children were enrolled in school at the time of the survey), we use household income as a proxy variable to test for this hypothesis. We use both absolute and relative household income variables, separately and then together, in our regression to see the change in effect of absolute income once relative income is controlled for. This method has also been applied in Blanchflower and Oswald (2004) paper, which included both absolute and relative income in one regression. We also try two different ways of measuring relative income in our sample: one is to include a variable in the regression for the average household income level in the cluster, and second, the relative income variable is measured by the ratio of a household income to the average income per cluster.

2.3 On other determinants of happiness

If more money does not make people happier, then an obvious question to researchers is what makes an individual happy? Layard (2005) lists seven factors affecting happiness in order of 'importance': family relationships, financial situation, work, community and friends, health, personal freedom and personal values. Blanchflower and Oswald (2004) conclude that money and sex can buy happiness using a sample of 16,000 American adults. Most of the studies use data from developed countries (UK, US) and often focus on the causes of adults' happiness rather than that of children. Therefore, the main explanatory variables of interests very often are unemployment, marriage, divorce, sex, race, age, or working hours at the individual level (Blanchflower and Oswald 2004).

Unfortunately, these variables are not useful or relevant when it comes to explaining the determinants of a child's happiness. In our sample of the 12-year-old cohort, the children were all similar in age, and almost all of them were enrolled in school at the time of the survey. Given that a big part of a child's life is spent at school or playing with friends, it is plausible that other controlled variables, rather than household income, such as educational achievement, nutritional status and social inclusion are important to a child's well-being.

Social inclusion has been mentioned in psychology, sociology and other literature for a long time as one of the main determinants of happiness. Recent economic theory on poverty also emphasises the importance of social exclusion as another dimension of deprivation and a denial of basic entitlement (Sen, Kanbur).

We chose a number of indicators representing a child's social inclusion, which are available from the data and included in the regressions, such as the number of friends a child has, whether a child is looked up to as a leader, and whether a child feels included in the game. We also constructed a social active index on a scale of 0-1 which measures how many youth clubs a child participated in out of a total of seven questions asked³.

3. Data description

In the Young Lives Round 2 survey (2006), subjective well-being was measured for the 12-year-old cohort by showing each child a picture of a ladder with nine steps and asking the following question:

“There are nine steps on this ladder. Suppose we say that the ninth step, at the very top, represents the best possible life for you and the bottom represents the worst possible life for you. Where on the ladder do you feel you personally stand at the present time?”

The answers were recorded on the scale of 1-9 and interpreted as the life satisfaction score/subjective well-being measure/happiness for the 12-year-old child. Similar questions were also asked of the caregiver (mostly, the child's mother) as well as what position on the ladder the child (and caregiver) thinks he/she will be in four years' time.

A quick summary of the data (see Table 1 below) shows that in the Young Lives 12-year-old cohort in Vietnam, 20 per cent of the children lived in urban areas, 87 per cent are from the ethnic majority (Kinh), 97 per cent were enrolled in school at the time of the survey, and 13 per cent were underweight. Years of father's education were on average, 7.8 years, while the mother had slightly less schooling, 6.9 years on average.

3 The child was asked if he/she was a member of each of the following seven groups: youth group, sports group, religious group, after school club, informal child-organised group, work-related group, school committees. So if the child joined three out of seven groups for example, then the social active index is $3/7 = 0.43$

Table 1. *Summary of descriptive statistics*

	Obs	Mean	Std. Dev.	Min	Max
Child's characteristics					
Child's subjective well-being	989	4.8	1.7	1	9
Child sex	990	0.5	0.5	0	1
Living in urban location	989	0.2	0.4	0	1
Child's ethnicity (Kinh)	990	0.9	0.3	0	1
Child is enrolled in school	987	1.0	0.2	0	1
Child's PPVT score	986	166.6	32.7	12	204
Child has long-term health problem	989	0.1	0.3	0	1
Child is underweight (based on BMI score)	831	0.1	0.3	0	1
Household's characteristics					
Father's years of schooling	983	7.8	4.1	0	16
Mother's years of schooling	987	6.9	4.0	0	16
Caregiver's subjective well-being	989	4.3	1.4	1	9
Household income per capita	990	5350.6	7504.2	0	90000
Household expenditure per capita	831	509.8	643.3	50.65669	13565.9
Social networks					
Number of friends	831	12.7	13.8	0	100
Being looked up as leader	831	0.3	0.5	0	1
Feeling included in the game	831	1.0	0.1	0	1

The figures below (Figure 1) show the Kernel density of life satisfaction for the 12-year-old group now (on the left) and where he or she hopes to be in four years' time (on the right). There is a shift in the distribution to the right, with the mean of the distribution increased from 4.79 to 6.29, reflecting the child's belief that they will be happier in the future. The figures for caregivers' life satisfaction (Figure 2) also show similar shift in the distribution to the right, with a higher mean of 5.52 in four years' time compared to 4.79 at the time of the survey. One noticeable thing is that children are, on average, happier and more optimistic than their caregivers, both about their situation now and in the future.

Figure 1. *Life satisfaction of the 12-year-old group, now and in four years*

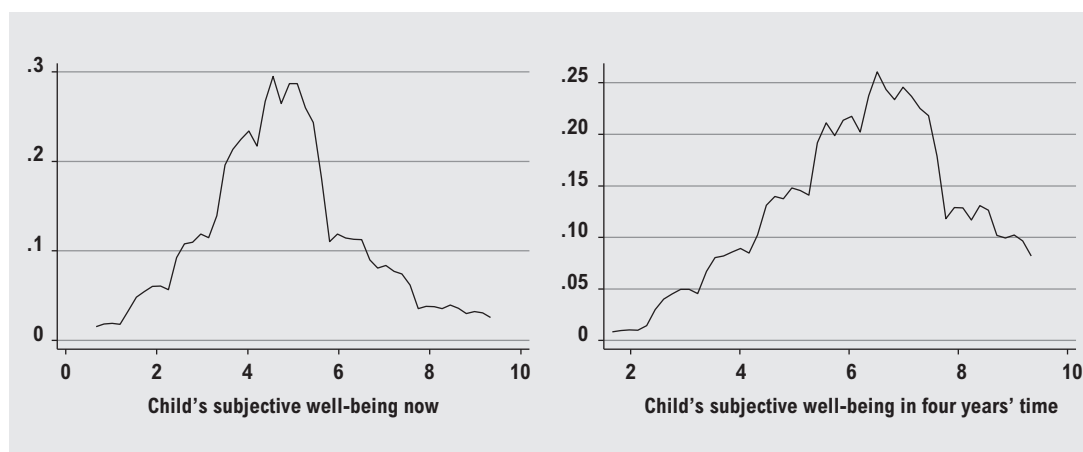
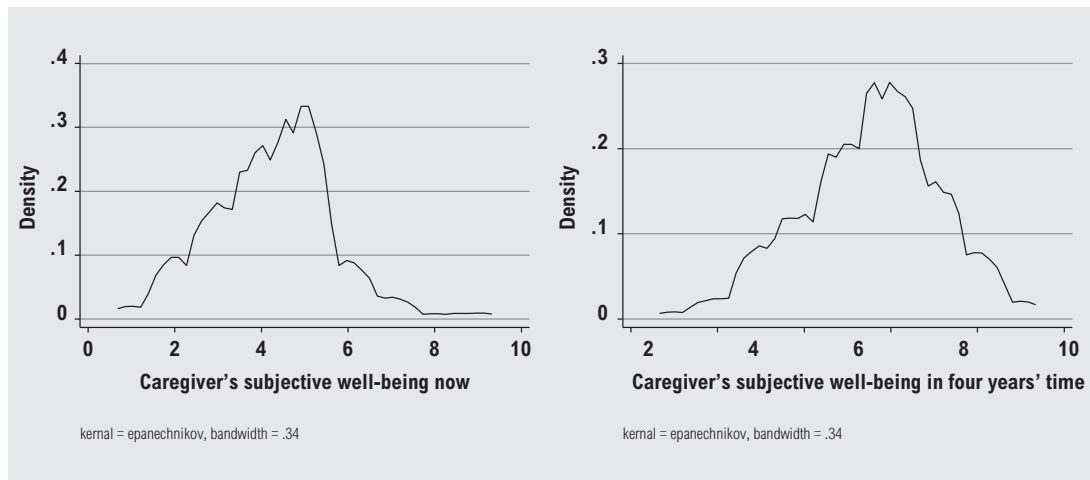


Figure 2. Life satisfaction of the caregiver group, now and in four years



The data also reveal how a child's happiness differs from an adult's happiness. The Young Lives survey asks a child to name the reasons why they would feel happier in the future (moving up the ladder) and poses the same question to the caregiver. It is interesting to note that, for an adult, making more money is the top reason for being happier in the future, while for a 12-year-old child, his/her own education comes first and making more money comes second (see boxes below). We try to capture this result quantitatively by including variables on education in the child's happiness equation.

Top 3 reasons for an adult to be happier in the future (moving up the ladder)	Top 3 reasons for a child to be happier in the future (moving up the ladder)
1. Making more money (22.48%)	1. My education (22.88%)
2. Work harder (19.92%)	2. Making more money (18.96%)
3. Better job (10.88%)	3. Better job for me/my family (11.65%)

Two aspects of education that can potentially influence a child's happiness are: (a) whether a child is currently enrolled in school or not (97 per cent of our sample is enrolled in school so there is not much variation on this) and (b) educational achievement. Due to lack of data, educational achievement is proxied by the child's PPVT score on the assumption that if a child is good at maths and vocabulary, then he/she is also doing well at school.

Further breakdown of the data shows that children from ethnic minority and poor households have significantly lower subjective well-being compared to those from ethnic majority and non-poor households. Given that ethnic minority children account for only 13 per cent of the sample, this group has a lower life satisfaction score compared to children from the ethnic majority (Kinh). The mean for the minority group children is 3.8 compared to 4.9 for the Kinh children. This gap is very similar to that between children from poor and non-poor households. Children from poor households (as listed by the Government) also have lower subjective well-being, on average, than those from non-poor households, with an average life satisfaction of 3.87 compared to 4.98.

4. Estimation strategy

As mentioned in section 2, we are not interested in the cardinal value of subjective well-being data but rather it is the ordinal value that matters i.e higher reported subjective well-being reflects higher well-being of an individual. For this purpose, the dependent variable, measured on the scale of 1-9, is treated as a discrete and ordered variable. Therefore, the appropriate form to estimate the determinants of happiness at the individual level is an ordered latent response model in the form:

$$\begin{aligned} Y_i^* &= x_i\beta + u_i \\ Y_i &= 1 \text{ if } Y_i^* \leq 0 \\ &= 2 \text{ if } 0 < Y_i^* \leq \mu_1, \\ &\dots \\ &= 9 \text{ if } \mu_8 \leq Y_i^* \end{aligned}$$

where Y_i^* the latent variable which is unobserved and Y_i is the observed subjective well-being which takes the value from 1 to 9. Depending on the assumed distribution of the error-term u_i , this leads to an ordered probit or an ordered logit model, which can be solved by maximum likelihood method or logistic regression. We used ordered logit regression to estimate this model⁴.

On the right-hand side, we control for a number of child's characteristics (sex, ethnicity, education, health, etc) and his/her household characteristics (parental education, caregiver's happiness, etc). Since education is the most important reason that a child feels happier, we include two education measures: a dummy variable for whether a child is enrolled in school and a child's PPVT score as a proxy for educational achievement⁵. Absolute income is also measured in two ways: household income per capita and the log of household income per capita. To test for the role of absolute versus relative income on happiness, we also introduce two measures of relative income in the regression: average household income per cluster and a ratio of household's income to the average income in the cluster it belongs to. Finally, we include a set of variables on social networks i.e., the number of friends a child has, whether a child is being looked up to as a leader, whether a child feels included in the game, and a socially active index (0-1) indicating how many youth clubs out of a list of seven a child belongs to.

From a measurement error perspective, it is suggested that the inferences can be clouded by unobserved personality traits that influence individuals' socio-demographic and socioeconomic characteristics, as well as how they respond to subjective well-being questions (Bertrand and Mullainathan, 2001; Ravallion and Lokshin, 2001). There is likely to be an attenuation bias on the estimated income effect due to the poor income measures typically used in such studies. And there is almost certainly an endogeneity bias, due to a dependence of relevant individual characteristics on the latent personality traits that are known to influence self-rated welfare. The overall direction of bias in (say) the income effect on welfare is unclear on *a priori* grounds.

4 The only difference between an ordered probit and an ordered logit model is the scaling of the variance of the error terms, i.e. the variance of the disturbance term is 1 for Probit and $\pi^2/6$ for Logit.

5 There is no direct measurement of a child's educational achievement in the survey.

Since the life satisfaction ladder question was not asked of the same cohort during the first round of the survey, we are unable to use panel data to control for unobservable fixed effects of child characteristics. Therefore, the cross-sectional results here are interpreted with caution on the basis of correlation rather than a causal relationship in this case.

To improve the robustness of our estimation, we include different model specifications in our regressions such as using expenditure data instead of income data, controlling for cluster fixed effects, using different measures of absolute and relative income, and testing for the non-linearity of the effect of income on happiness.

5. Empirical results

This section presents results from a number of ordered logit regressions. We first test for the effect of absolute and relative income on a child's happiness. We then introduce social network variables into the equation. We also try different model specifications to test for robustness of the results e.g. using expenditure instead of income data⁶, and controlling for cluster fixed effects. Due to the non-linear nature of the ordered logit model, more attention is paid to the sign and statistical significance of a coefficient rather than its magnitude.

A few points emerged from the regression results across different model specifications⁷.

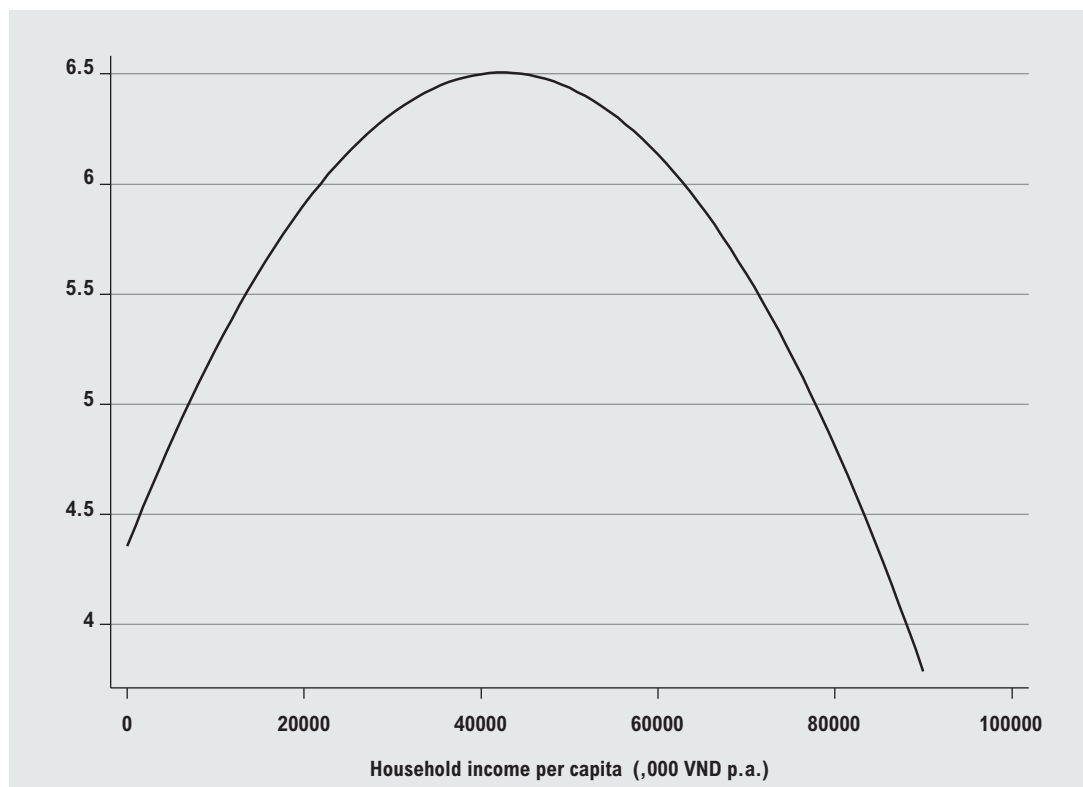
First, regarding the importance of household income to a child's happiness, the results show that absolute income is positively and significantly correlated with higher level of happiness. However, when relative income is included, absolute income becomes statistically insignificant in this case. The negative correlation between happiness and square of income variable shows the diminishing returns to income and an inverted U-shape (concave) relationship between household income and a child's happiness.

A simple quadratic fit between household income variables (measured both as household per capita and total household income level) and a child's subjective well-being level reveals a non-linear, concave relationship (Figure 3). Based purely on the empirical data of this sample, the optimal level of household income per capita which maximises happiness in the 12-year-old cohort in our sample is approximately 45 million VND per year (equivalent to 3.8 million VND per month or approximately \$200/month). Almost all (99 per cent) of children in the Young Lives sample live in households with an income below the optimal value.

6 Following Ravallion and Lokshin (2001), the reason is that expenditure measure is assumed to be comprehensive, including imputations for consumption in kind (such as from family farms or enterprises) as well as cash expenditures. Including expenditures can help compensate for certain types of income measurement error; for example, a household with illegal income is unlikely to report that income accurately, but it could well be better reflected in expenditures. It can also be argued that subjective welfare will depend more on long-run ("permanent") income, which will be better reflected in current expenditures than current incomes.

7 For detailed regression results, see tables in the appendix

Figure 3. *Quadratic fit of household income per capita and a child's subjective well-being*



Secondly, some other variables remain consistent in terms of statistical significance as well as the magnitude of coefficients throughout all different specifications, namely: caregiver's happiness, father's education, nutrition status (underweight), ethnicity, and whether a child lives in urban or rural area. It appears that the happier a child's caregiver is, the more schooling a child's father has, and whether a child is from ethnic majority are all variables associated with increased happiness in the child. On the other hand, if a child is underweight and lives in an urban area, these two factors are both associated with lower life satisfaction for the 12-year-old group.

The persistent strong and positive correlation between a child's happiness and caregiver's happiness across different model specifications, even when income is controlled for, is interesting because it could be interpreted as evidence that an individual's utility is also dependent on another individual's utility. However, this interpretation should be treated with caution as the coefficient estimate could be upward bias due to endogeneity of caregiver's happiness response. For example, the bias could be driven due to an unobserved variable which correlates with both level of caregiver and the child's happiness. Further work could look into testing for the exogeneity of the caregiver's happiness variable.

Third, social inclusion does matter for a child's happiness, to some extent. Out of the four variables on social networks, there are two variables (whether a child feels looked up as leader and whether they participate more actively in youth clubs) which are significantly and positively correlated with higher happiness across all different model specifications. Having more friends and feeling included in the game are not statistically significant in any of the regressions. One of the reasons could be due to the lack of variation in the variable 'whether a child feels included in the game'. Ninety nine per cent of the children in the sample answered yes.

6. Conclusions

This paper attempts to use cross-sectional empirical data on child subjective well-being to shed lights on some of the issues in the economic literature of happiness. Though the statistical inference is only from a correlation relationship, it nevertheless offers some evidence on what matters for a child's subjective well-being in a developing country.

Some of the main findings from our quantitative results are:

- Absolute income and expenditure are significant in a child happiness equation. However, this is no longer significant once relative income/expenditure is controlled for. There is some evidence of diminishing returns to income i.e., the relationship between income and happiness is an inverted U-shape. This supports Veenhoven's (1991) argument that happiness is, to some extent, need-gratification (Veenhoven 1991). If this is true, children from poor families are unhappier because their basic needs are not satisfied. Improving the living conditions of poor families could therefore improve children's well-being.
- There is a strong positive and significant correlation between a child's happiness and his/her caregiver's happiness, which remains persistently throughout different model specifications even after controlling for income. The cross-sectional result does not permit us to conclude whether a child is happy because his caregiver is happy or the other way round. This relationship could also be biased given the endogeneity of caregiver's happiness response. Further work could be done on this before we can conclude that an individual's utility is dependent on another's utility and hence, challenges the standard 'reveal-preference approach' to utility in the economic literature.
- Social inclusion is, to some extent, important to a child's well-being. It seems that social status (being looked up as leader) and being socially active (joining more youth clubs) are associated with higher happiness for a child. However, this relationship could be less significant than it appears to be if one argues that there is upward bias, given that a happier child is also more likely to participate in more clubs and to have more self-confidence to act as a leader.

However, the results of this paper could be further improved if there were happiness data available in the form of panel or longitudinal data or using fixed effect ordered probit model (Ferrer-i-Carbonell 2004). In addition, this paper has not quite captured the educational achievement aspect due to the lack of achievement data in the survey. Nor has the causal relationship of either family income or social networks on a child's happiness been established in this paper. More research could be done using the instrumental variable method or looking for some exogenous random shocks to household income in the dataset.

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Appendix: Regression results

Table A1: Ordered logit regression on 12-year-old life satisfaction using income

	Dependent variable is 12-year-old child's life satisfaction (1–9 scale)			
	(1)	(2)	(3)	(4)
Child characteristics				
Child's sex (1=Male, 0=Female)	0.1005	0.0835	0.1070	0.1019
Living in urban (1=urban, 0=rural)	-0.5389***	-0.5849***	-0.5155***	-0.4615***
Child's ethnicity (1= Kinh, 0 = Minority)	0.5374**	0.4664*	0.5207**	0.5720**
Child enrol in school (1=Yes, 0=No)	0.0381	-0.0191	0.0521	0.0915
Child PPVT score	0.0034	0.0035	0.0032	0.0032
Child has long-term illness (1=Yes, 0=No)	-0.2284	-0.2621	-0.2577	-0.2501
Child is underweight (1=Yes, 0=No)	-0.3863**	-0.4351**	-0.3794**	-0.3875**
Household characteristics				
Father's education (years of schooling)	0.0571***	0.0561**	0.0604***	0.0588***
Mother's education (years of schooling)	0.0312	0.0334	0.0353	0.0314
Caregiver's life satisfaction (1-9)	0.8014***	0.7851***	0.8081***	0.8049
Household per capita income	0.000041**		0.000016*	0.0000025***
Household per capita income square	-0.0000000004			
Log of per capita income		0.0611		
Square of log per capita income		0.0077		
Average income per cluster			0.0000	
Relative income				0.1216
Number of observations	828	817	828	828
LR chi2	380.3	368.5	377.9	379.3
Pseudo R2	0.1210	0.1191	0.1203	0.1207

Note: *** denotes statistically significant at 1% level, ** for 5% level and * for 10% level

Table A2: Ordered logit regression on 12-year-old life satisfaction using expenditure

	Dependent variable is 12-year-old child's life satisfaction (1–9 scale)			
	(1)	(2)	(3)	(4)
Child characteristics				
Child's sex (1=Male, 0=Female)	0.0850	0.0796	0.0941	0.0920
Living in urban (1=urban, 0=rural)	-0.5121***	-0.5602***	-0.4669*	-0.3446*
Child's ethnicity (1= Kinh, 0 = Minority)	0.5303**	0.4036*	0.5313**	0.5756**
Child enrol in school (1=Yes, 0=No)	0.0695	-0.0847	0.0851	0.0945
Child PPVT score	0.0033	0.0018	0.0034	0.0033
Child has long-term illness (1=Yes, 0=No)	-0.2115	-0.2175	-0.1880	-0.1828
Child is underweight (1=Yes, 0=No)	-0.3909**	-0.3669**	-0.3935**	-0.3892**
Household characteristics				
Father's education (years of schooling)	0.0612***	0.0548**	0.0654***	0.0625***
Mother's education (years of schooling)	0.0313	0.0297	0.0348	0.0361
Caregiver's life satisfaction (1-9)	0.8186***	0.7839***	0.8244***	0.8190***
Household per capita expenditure	0.0003*		0.0000	-0.0003
Household per capita expenditure square	-0.00000004**			
Log of per capita expenditure		3.0434***		
Square of log per capita expenditure		-0.2170**		
Average expenditure per cluster			0.0000	
Relative expenditure				0.2552
Number of observations	828	828	828	828
<i>LR chi2</i>	379.12	385.39	374.02	376.48
<i>Pseudo R2</i>	0.1207	0.1227	0.119	0.1198

Note: *** denotes statistically significant at 1% level, ** for 5% level and * for 10% level

Table A3: Ordered logit life satisfaction regression including social network variables

	Dependent variable is 12-year-old child's life satisfaction (1-9 scale)			
	(1)	(2)	(3)	(4)
Child characteristics				
Child's sex (1=Male, 0=Female)	0.0898	0.0813	0.0980	0.0979
Living in urban (1=urban, 0=rural)	-0.3412*	-0.5288***	-0.5293***	-0.4547***
Child's ethnicity (1= Kinh, 0 = Minority)	0.5585**	0.5188**	0.5242**	0.5506**
Child enrol in school (1=Yes, 0=No)	-0.0228	-0.0531	-0.0668	-0.0221
Child PPVT score	0.0038	0.0039	0.0039	0.0038
Child has long-term illness (1=Yes, 0=No)	-0.1739	-0.2086	-0.2098	-0.2291
Child is underweight (1=Yes, 0=No)	-0.3773**	-0.3779**	-0.3752**	-0.3769**
Household characteristics				
Father's education (years of schooling)	0.0592***	0.0576***	0.0552**	0.0565*
Mother's education (years of schooling)	0.0353	0.0310	0.0305	0.0307
Caregiver's life satisfaction (1-9)	0.8268***	0.8251***	0.8117***	0.8153***
Household per capita expenditure	-0.0003	0.0004*		
Household per capita expenditure square		0.0000**		
Household per capita income			0.0000**	0.0000
Household per capita income square			0.0000	
Relative income				0.1061
Relative expenditure	0.2529			
Social networks				
Number of friends	-0.0006	-0.0032	-0.0008	-0.0002
Looked up to as leader	0.2759**	0.2909**	0.2740**	0.2641**
Included in games	0.1907	0.1811	0.1395	0.1586
Socially active index	1.4623***	1.5283***	1.3258***	1.3646**
Number of observations				
	828	828	828	828
LR chi2	389.3	392.96	391.47	390.56
Pseudo R2	0.1239	0.1251	0.1246	0.1243

Note: *** denotes statistically significant at 1% level, ** for 5% level and * for 10% level

Table A4: *Ordered logit life satisfaction regression controlled for cluster fixed effect*

	Dependent variable is 12-year-old child's life satisfaction (1–9 scale)			
	(1)	(2)	(3)	(4)
Child characteristics				
Child's sex (1=Male, 0=Female)	0.1606	0.1603	0.1633	0.1479
Living in urban (1=urban, 0=rural)	0.7483	0.7182	0.7145	0.6983
Child's ethnicity (1= Kinh, 0 = Minority)	0.1542	0.1954	0.1531	0.0793
Child enrol in school (1=Yes, 0=No)	-0.1904	-0.2062	-0.1939	-0.2678
Child PPVT score	0.0064**	0.0066**	0.0064**	0.0067**
Child has long-term illness (1=Yes, 0=No)	-0.2258	-0.1789	-0.2160	-0.2266
Child is underweight (1=Yes, 0=No)	-0.4328**	-0.4430**	-0.4382**	-0.4355**
Household characteristics				
Father's education (years of schooling)	0.0497**	0.0462**	0.0498**	0.0461**
Mother's education (years of schooling)	0.0177	0.0107	0.0179	0.0125
Caregiver's life satisfaction (1-9)	0.8188***	0.8085***	0.8186***	0.8097***
Household per capita income	0.000019*	0.000053***	0.000018*	-0.000014
Household per capita income square		-0.000000001**		
Average income per cluster			0.0003	
Relative income				0.2377**
Social networks				
Number of friends	-0.0061	-0.0063	-0.0060	-0.0064
Looked up to as leader	0.2845**	0.2833**	0.2846**	0.2626*
Included in games	-0.2547	-0.3253	-0.2574	-0.2853
Socially active index	1.3469**	1.2768**	1.3420**	1.3768**
Number of observations	828	828	828	828
<i>LR chi2</i>	456.18	459.92	456.46	460.21
<i>Pseudo R2</i>	0.1452	0.1464	0.1453	0.1465

Note: *** denotes statistically significant at 1% level, ** for 5% level and * for 10% level

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