LIFE SATISFACTION AND MATERIAL WELL-BEING OF CHILDREN IN THE UK

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Abstract

Policymakers across the world increasingly recognise the importance of life satisfaction as a desirable individual outcome for persons at all stages of the life-cycle. Policy attention with respect to child well-being has focused on improving the financial position of families with children. Using data from *Understanding Society* this paper investigates whether child life satisfaction is associated with household income (poverty), or with a set of new material deprivation measures of child poverty, introduced to help target effective policies that make a real difference to children's lives. Whilst we find no association with household income, children report lower life satisfaction if adults in their household, or they themselves have to go without things perceived as necessities for them to participate in mainstream society. Examination of individual components of child material deprivation suggests that those interested in maximizing society's welfare should shift their attention from an emphasis on increasing consumption opportunities for families with children to an emphasis on increasing social contacts.

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Introduction

There is a growing body of empirical literature which suggests that life satisfaction is associated with a wide range of positive outcomes in the present as well as in the future. People who report that they are satisfied with their life have been shown, for instance, to be more successful in their social and economic lives, they tend to have more fulfilling relationships, high incomes, and more community involvement than their less satisfied peers (for a review, see Lyubomirsky, King, and Diener 2005), and they will live longer healthier lives (Diener and Chan 2011). Moreover, previous life satisfaction and successes have an influence on current behaviour (Clark, Diener, Georgellis, and Lucas 2008), making life satisfaction a desirable individual outcome for persons at all stages of the life-cycle.

Policymakers, too, have recognised the importance of satisfaction both as an outcome for individuals and also for policymaking. In the United Kingdom, for instance, results from national surveys on satisfaction with the provision of local services have been used to identify policy areas that matter most to people, and over time, to monitor success in improving services that were ill-performing, as evidenced, for instance, by the use of Best Value Performance Indicators in policymaking.

One of the paramount goals of the UK government, and many others, has been to improve children's lives. Substantive resources have been allocated to achieving this goal, focussing primarily on remediation of financial hardship in which an increasing number of children were growing up following the recessions of the 1980s and the early 1990s. In contrast to other policy areas, however, there has been little research into whether or not these measures (i.e., redistribution of income to benefit families with children who otherwise would be counted as income poor) have been successful in improving child well-being measured by their personal account of how satisfied they are with their life.

Given the current focus of many national governments on measuring population well-being, and renewed focus on effective policy interventions to aid disadvantaged children, in this paper we address the question of whether different markers of material well-being affect child life satisfaction and may, therefore, play an important role in maximizing population well-being. From the perspective of the

child poverty research, we advance the literature by providing results on the association between child poverty markers and child life satisfaction for a cohort of children born between 1999 and 2004, and representative of children living in the United Kingdom, a country known for its high prevalence of child poverty. From the perspective of the happiness research this paper explores whether factors associated with life satisfaction in adults are also associated with life satisfaction in children. Whilst there has been some research looking at associations with different aspects of life, there have not been many studies reporting results on child life satisfaction using comprehensive (micro-economic) happiness models.

Child poverty in the UK

Children are poor, according to scientific convention for international comparisons, if they live in a household with a needs-adjusted income that is below 50 (or 60) per cent of the median income in their country. Child poverty rates in the UK had been rising since the late 1970s. According to a report by UNICEF, 16.5 per cent of children aged 0-17 living in the UK were living in a poor household in 2000. Among 24 member countries of the Organisation for Economic Co-operation and Development (OECD) this rate was topped only by the United States of America where 22 per cent of all children in this age group lived in poverty (UNICEF 2007).

In 1999, the Labour government made the eradication of child poverty by 2010 one of their priorities in welfare reform (Blair 1999). Political measures introduced to this end included, among many others, the introduction of a minimum wage, real increases in child benefits, introduction of tax credits for children, and improved access to social housing for families. A number of studies have documented the success of the policies, in terms of head counts of children in income poverty. The UK's Department for Work and Pensions (DWP), for instance, reports that child poverty rates have been falling from 22 percent in 1998/9 to eleven percent in 2008/9 (DWP Information Directorate 2010). Albeit, there is also evidence which suggests that the UK continues to be placed at the top of the league table of child poverty in international comparisons. Bradshaw (2011) reports, for instance, that the UK is in fifth place among 28 European countries in 2009, topped only by Italy and the much less developed countries Latvia, Bulgaria and Romania, respectively.

However, income-based poverty measures are arbitrary, and organisations such as the European Commission have long taken the view that poverty is multi-dimensional. In 1989, the organisation declared that "the poor shall be taken to mean persons, families or groups of persons whose resources (material, cultural, social) are so limited as to exclude them from the minimum acceptable way of life in the Member State in which they live" (Commission of the European Comunities 1989).

New multidimensional markers of poverty have been developed. These measures tie in with Townsend (1979)'s seminal work on 'relative poverty' and material deprivation, in that they consider whether people are excluded from mainstream society on account of income poverty. Whilst Townsend's original empirical approach was to identify an income threshold below which people would be observed to go without things that he considered necessary to keep up with the living standards typical in society, the deprivation-linked idea was picked up by the following Breadline Britain and Poverty and Social Exclusion surveys but involved extensive research into what it is that people consider necessities (see, e.g., Gordon and Pantazis 1995; Mack and Lansley 1985). The projects identified scientifically items marking 'social, cultural and material participation' which were perceived by a majority as necessities. Random samples of the population were then asked whether they had this, and if not whether they were going without due to lack of money, or choice. In this framework, people are considered poor if they lack a number of necessary items because they could not afford them. Meanwhile, organisations such as the European Commission, the OECD and DWP have also adopted a new child poverty measurement which draws on both the income and material deprivation approaches.

It has been suggested that living in an income-poor household and also not being able to afford things that most people consider necessary for children to participate in mainstream society (so-called child material deprivation) represents a child poverty measure that is suited to capture such differences that make a real difference to children's quality of life (Willitts 2006). It remains an empirical question, however, whether it is indeed the case that children who have the same standard of living as other children despite living in a family on a low income are

more satisfied with their life than children for whom this is not true (i.e., than those children who would be considered poor).

Linking material well-being and life satisfaction

The relationship between life satisfaction and family income (and other markers of material well-being) has not been analysed systematically for children in the UK.[1] To the extent that a basic sustainable income is essential if individuals are to have access to resources needed to fulfil basic needs and participate in mainstream society, we may expect a positive relationship between income and life satisfaction. This has been documented in the research on life satisfaction in adults (Diener, Sandvic, Seidlitz, and Diener 1993; Ferrer-i-Carbonell 2005). The relationship between income and life satisfaction may not be that strong for children though (Burton and Phipps 2010a). Unlike adults, children may not view their family's income as a sign of their personal success. They are also less likely to have an insight into the family finances and/or may misjudge how much money is required to run the family. In addition, there is empirical evidence that parents shield their children from financial hardship by spending on their children rather than themselves (Middleton, Ashworth, and Braithwaite 1997). This may mislead the children in their assessment of their family's financial situation and consequently blur the association between family income and life satisfaction. However, when lack of income means that families cannot afford to engage in activities or consume things that others have no problems affording, this may not go unnoticed by the children and affect their quality of life. This may be particularly true if they themselves are excluded from activities and consumer goods enjoyed by their peers.

Against this background, the question arises whether different markers of material well-being are associated with child life satisfaction. *Understanding Society*, the new UK Household Longitudinal Study (UKHLS), provides information on household income, household and child material deprivation alongside children's own accounts of how satisfied they are with their life, allowing us to investigate empirically whether the measures do indeed capture differences in the perceived quality of life of children.

[1] The Children Society and the Poverty and Social Exclusion Survey team have undertaken some pilot studies but the results indicated that there is no statistically significant association. Analysis was impeded by the small number of cases.

Other factors associated with child life satisfaction

Life satisfaction is typically used as a catch-all measure to assess people's quality of life. It is "a reflective appraisal, a judgment, of how well things are going, and have been going" (Argyle 2001). The happiness research suggests that people consider seven key aspects of their life when reporting their life satisfaction: their family-living context, health, financial situation, work-life, community and friends, personal values and personal freedom (Layard 2005). External factors play an important role when people make this appraisal.[2] For instance, happiness research has shown that marital status is a robust indicator of satisfaction in adults (Layard 2005), and living with both biological parents is a key predictor of child subjective well-being (see, e.g., Keung 2006; Powdthavee and Vignoles 2008). The relevance of external factors can be linked to the philosophical assumption that there are universal needs which have to be met in order for people to be happy, and people who find themselves in a 'good situation' for the fulfilment of needs are happy, while those who find themselves in a 'bad situation' are unhappy (e.g., Diener, Suh, Lucas, and Smith 1999).

The bulk of the empirical research investigating factors associated with life satisfaction is based on adult populations. The few existing studies based on representative cohorts of children tended not to be powerful enough to allow estimation of multivariate happiness models. The research reporting bivariate associations with child life satisfaction suggests that the aspects of life that are important to adult satisfaction also matter to children. In particular, satisfaction with school, friends and the immediate family play a paramount role for child life satisfaction. When asked about one thing they would like to change in their life for it to improve, many children mention family-related issues: they would like their parents to reunite, live with the absent parent or have less conflicts with siblings (Scott and Chaudhary 2003 and author's analysis of the free-text responses provided by children aged 11-15 in the British Household Panel Survey, BHPS). The importance of family characteristics is marked also by the finding that not living in a household with both biological parents and with more other children reduces children's life satisfaction (see, e.g., Powdthavee and Vignoles 2008).

[2] For alternative philosophical theories see Brief, Arthur P., Ann Housten Butcher, Jennifer M. George, and Karen E. Link. 1993. "Integrating bottom-up and top-down theories of subjective well-being: The case of health." *Journal of Personality and Social Psychology* 64:646-653.

Basic characteristics such as age and gender, too, appear to be responsible for differences in happiness from an early stage in life. Among all children in the UK, it is those aged 13-15, and among them girls in particular, who are unhappier with their life (Bradshaw and Keung 2010; Scott and Chaudhary 2003). Burton and Phipps (2010b) identified a negative relationship between minority ethnic background and life satisfaction, which the authors suggest may be attributable to the lower income position of minority ethnic groups in Canada. Perhaps the biggest gap in the literature on child life satisfaction is in the area of health. Bradshaw and Richardson (2009) noted that children in the UK report to be of poorer health than their international peers, and they tend to be unhappier, but there is to our knowledge no study investigating the link directly.

Methods

Empirical strategy

To analyse the association between life satisfaction and different markers of material well-being we will first examine bivariate relationships. We will then estimate standard micro-economic life satisfaction models (for instance, Clark, Diener, Georgellis, and Lucas 2003; Clark and Oswald 1996; Frey and Stutzer 2002):

$$Y_i = \alpha + \beta' X_i + \varepsilon_i \qquad i = 1, \ldots, n$$

where Y_i denotes life satisfaction for child$i$, X is a vector of characteristics that are held to influence life satisfaction of child i, and ε is a randomly distributed error term.

In a first step, this analysis will only include markers of material well-being as independent variables. Next, basic socio-demographic characteristics will be included to see whether results are robust. Last but not least, we will include a full range of covariates tabbing into all aspects of life that have been suggested to influence life satisfaction.

Our leading hypotheses are as follows. We hypothesise that household income is not, household material deprivation somewhat, and child material deprivation crucially important for child life satisfaction. Moreover, the association with household and child material deprivation will be more marked when individual

items of the composite index are weighted by the proportion of the population enjoying the item. Last, but not least, we hypothesise that the associations are real, i.e., not driven by spurious correlations with basic socio-demographic characteristics, or other aspects of life that have been suggested to influence happiness.

Data

This research draws on data from *Understanding Society*, the new UK Household Longitudinal Study (UKHLS). UKHLS is an annual longitudinal household panel survey, managed by the Institute for Social and Economic Research (ISER) at the University of Essex. The multi-focus multi-topic social survey started in 2009 with a nationally-representative stratified, clustered sample of 27,000 households living in the United Kingdom.[3] Fieldwork takes place over a period of 24 months, with a random sample of households issued for interview each month. Within each household, all those aged 10 and above were eligible for interview, and individuals and all members of their households are followed annually. Currently, interviews are under way for the third and fourth waves of annual interviews, and data from the first wave have been made available to the scientific community.[4]

Understanding Society provides a wealth of information not only on household composition, employment, well-being and living standards. Interviews with children living in sample households are an integral part of *Understanding Society*. In Wave 1, the UKHLS youth sample contains data from about 4,900 children aged 10-15. Information is collected using a self-completion questionnaire, which in Wave 1, focused on health, health behaviour, psychological well-being and family relationships. In this research, we use information from the UKHLS youth sample and augment it with information on their family's material well-being, which is available from interviews with an adult in the household.

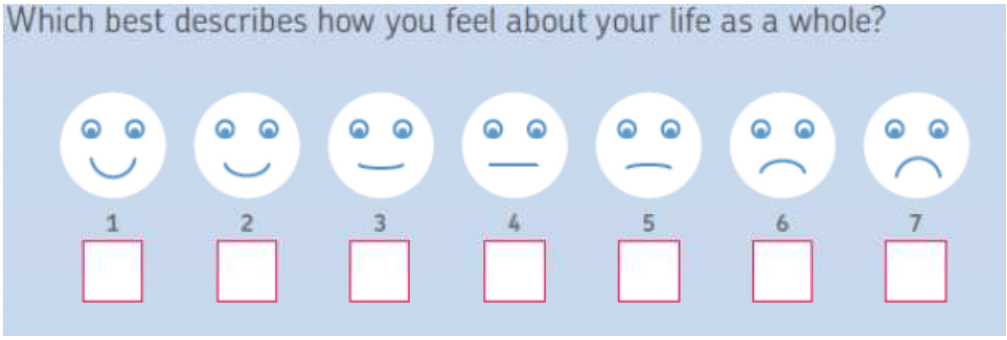
Measures

Our key outcome variable, life satisfaction, is collected in the youth questionnaire on the basis of a 7-point scale where categories are represented by more or less

[3] In total, the study follows the lives of 40,000 households in more than 3,000 sampling points across the UK. The Innovation Panel (1,500 households) and British Household Panel Study (approximately 8,000 households) samples are excluded from this analysis.
[4] For further detail on the study design and data access consult www.understandingsociety.org.uk.

smiling faces. Children are asked to tick the box which best describes how they feel about their life as a whole (Figure 1). Note that it is standard practise in the happiness research to reverse the coding of the information so that higher values on the life satisfaction scale represent greater satisfaction.

Figure 1
Survey instrument used to elicit life satisfaction in children (aged 10-15)



Material well-being indicators. There are three measures of children's material situation. The first is a measure of gross usual monthly household income (deflated using the modified OECD equivalence scale to allow comparisons of welfare positions across households with different numbers of adults and children[5]). We include in the analysis households with zero or negative household income[6], but exclude those above the 99th percentile of the household income distribution. The average household income in households with children (aged 10-15) is £1,144 per month.

In addition, we use two indices of material deprivation, which have been proposed by to measure the more permanent financial strain on families with children. The first index, dubbed Household Material Deprivation Index (HMDI), measures the

[5] The needs of a household grow with each additional member but not in a proportional way. This is due to economies of scale in consumption. Needs for housing space, transportation and electricity, for example, will not be five times as high for a household with five members than for a single person. In the scale, persons aged 15 or above count as adults.
[6] Note that household income will enter the multivariate models in log form. To facilitate this transformation without losing observations with non-positive household incomes, all household incomes were increased by the amount needed to shift the household with the lowest income to £0.01. The lowest household income observed in our estimation sample is £-318.

material deprivation of adults in the household. The head of the household is asked to report:

Do you (and your family partner) have...

1. A holiday away from home for at least one week a year, whilst not staying with relatives at their home?
2. Friends or family around for a drink or meal at least once a month?
3. Two pairs of all weather shoes for all adult members of the family?
4. Enough money to keep your house in a decent state of repair?
5. Household contents insurance?
6. Enough money to make regular savings of £10 a month or more for rainy days or retirement?
7. Enough money to replace any worn out furniture?
8. Enough money to replace or repair major electrical goods such as a refrigerator or a washing machine, when broken?

The response categories for each of these questions are (1) I/we have this (2) I/we cannot afford this (3) I/we do not need/want this. When a respondent felt this question was not applicable to them this was coded to (4) not applicable (spontaneous).

To generate the HMDI, each household that cannot afford the item is assigned a value of 1 (all others: 0), then multiply this by the proportion of the population that has the item[7], then summed this, and divided over the total number of items. The idea behind weighting the item by the proportion of the population that has the item is that not having it may hurt more the more people have it. The index can range from 0 to 1, with 1 representing a household lacking all items that everybody else has. The mean HMDI score for our sample is 0.19.

The second index, dubbed Child Material Deprivation Index (CMDI), is calculated over nine items relating to children's material deprivation. The head of household responsible for children aged 0-16 in the household is asked whether (all) child(ren) have/do

1. A family holiday away from home for at least one week a year?

[7] Respondents who felt the question was not applicable to them are excluded from this calculation.

2. Enough bedrooms for every child of 10 or over of a different sex to have their own bedroom?
3. Leisure equipment such as sports equipment or a bicycle?
4. Celebrations on special occasions such as birthdays, Christmas or other religious festivals?
5. Go swimming at least once a month?
6. A hobby or leisure activity?
7. Have friends around for tea or a snack once a fortnight?
8. Go to a toddler group, nursery or playgroup at least once a week?
9. Go on school trips?

The response categories are (1) Child(ren) have this, (2) Child(ren) would like this but I/we cannot afford this, (3) Child(ren) do not need/want this. When a respondent felt this question was not applicable to them this was coded to (4) not applicable (spontaneous).

The Child Material Deprivation Index (CMDI) is calculated and interpreted in the same way as the HMDI. The mean CMDI score for our sample is 0.07.

Other confounders

Basic socio-demographic characteristics (age, sex, country of residence, and ethnicity[8]) will be included in the baseline models alongside two markers of the household composition (both biological parents in the household versus other family types; log of number of children aged 0-15 in the household).

To test how robust the results are to inclusion of other aspects of life, we then include the following markers. We include children's report of the frequency by which others misbehave at school as an indicator for the quality of the school environment. To throw some light at the importance of friendships and being embedded in the community, we include markers for (1) the number of close friends a child has (in log form; note that zeroes are treated as 0.0001 so as not to lose respondents who have no friends from the analysis), (2) whether the child has

[8] UKHLS includes a boost sample of minority ethnic groups in Great Britain, facilitating research into whether life satisfaction differs for specific ethnic groups. For children, the results did not suggest that there was an association, and in the final model we consider whether or not children belong to the majority British/Irish White group rather than using more detailed categories. Note that in cross-national research, ethnicity, or if available, citizenship, are often used as indicators of personal freedom.

a religion (yes=1, no=0), (3) whether the child has Internet access at home (yes=1, no=0), and (4) whether the child spends more than one hour daily interacting via social websites like Bebo, Facebook or MSN (yes=1, no=0). Using Internet at home and spending a lot of time on the Internet may also be viewed as an indicator for not leading a particularly active and healthy lifestyle. To address this, we flag those behaviours in children that have been shown to be associated with poor health in later life. In particular, we include in our models whether the child (1) eats five or more portions of fruit and vegetables on a typical day (reverse coded and dubbed 'low fruit/vegetables consumption'), and whether the child (2) eats fast food (almost) every day (dubbed 'high fast food consumption'.[9] We also flag whether children do sports at least once a week (yes=1, no=0).[10]

Table 1 reports descriptive statistics of all indicators used in the analysis. For exact question wording consult the study questionnaires which are provided on the study homepage, www.understandingsociety.org.uk. Analysis is conducted using the data analysis software Stata 12. We use the programme's svy suite of commands to assure that standard errors are corrected for the complex survey design, which involves clustered, stratified random sampling in Great Britain and simple random sampling in Northern Ireland. All results are weighted using *Understanding Society* cross-sectional response weights.[11]

[9] A third measure, whether or not children eat crisps or sweets (almost) every day did not show any association with life satisfaction and was, therefore, not included in the analysis.

[10] We also tested whether or not there was an association with life satisfaction of watching television for more than one hour per day, or with cycling to school. The indicators were not included in the final model as there was no association with happiness.

[11] Household-level indicators such as household income and material deprivation are weighted using the household response weights; analyses at child-level employ the youth self-completion response weights.

Table 1
Descriptive statistics

	N	*Mean*	*Std. Dev.*	*Min*	*Max*
Age	4,899	12.51	1.70	10	15
Female	4,899	0.50	0.50	0	1
Females aged 10-12	4,899	0.25	0.43	0	1
Country					
England	4,899	0.85	0.36	0	1
Wales	4,899	0.05	0.21	0	1
Scotland	4,899	0.07	0.25	0	1
Northern Ireland	4,899	0.04	0.20	0	1
British/Irish White	4,899	0.64	0.48	0	1
Family type					
Natural family	4,899	0.59	0.49	0	1
Step family	4,899	0.11	0.31	0	1
Single mom family	4,899	0.26	0.44	0	1
Other	4,899	0.04	0.21	0	1
Number of other children in household					
No others	4,899	0.29	0.45	0	1
1 other	4,899	0.40	0.49	0	1
2 others	4,899	0.20	0.40	0	1
3 or more others	4,899	0.11	0.31	0	1
Household income, equiv. (in £)*	4,840	1,114	618	-318	6,324
Household Material Deprivation					
items not weighted	4,899	0.27	0.29	0	1
items weighted (HMDI)	4,899	0.19	0.20	0	1
Child Material Deprivation					
items not weighted	4,899	0.10	0.16	0	1
items weighted (CMDI)	4,899	0.07	0.11	0	1
CMDI - items					
holidays	4,899	0.32	0.46	0	1
own bedroom	4,899	0.14	0.34	0	1
leisure equipment	4,899	0.08	0.28	0	1
celebrations	4,899	0.04	0.19	0	1
swimming	4,899	0.10	0.29	0	1
a hobby	4,899	0.07	0.26	0	1
friends around	4,899	0.07	0.25	0	1
toddler group	4,899	0.01	0.10	0	1
school trips	4,899	0.04	0.19	0	1

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Table 1
(continued)

	N	Mean#	Std. Dev.	Min	Max
Extent others misbehave at school					
in most classes	4,861	0.27	0.44	0	1
less often, in more than half of classes	4,861	0.21	0.40	0	1
about half of classes	4,861	0.17	0.38	0	1
now and then/not a problem	4,861	0.36	0.48	0	1
Number of close friends**	4,584	7.43	7.58	0	82
Has stated a religion	4,896	0.61	0.49	0	1
Uses Internet each day	4,862	0.53	0.50	0	1
Uses social websites >1 hour each day	4,899	0.35	0.48	0	1
Low fruit/vegetables consumption	4,858	0.05	0.22	0	1
High fast food consumption	4,873	0.02	0.13	0	1
Does sports at least once a week	4,899	0.93	0.25	0	1

Notes: # Proportion of the sample in case of dummy indicators.
* To facilitate log transformation of non-positive household incomes, household incomes employed in the multivariate models are increased by the lowest household income reported in the estimation sample (£-318), and £0.01.
** In the multivariate models zeroes will be recoded to 0.001 so as to facilitate log transformation.
Source: *Understanding Society*, Wave 1, 2009-2010.

Results

Population estimates of life satisfaction and material well-being

Table 2 provides population estimates for children aged 10-15 living in the UK with respect to the main study characteristics. Overall, children appear to be very satisfied with their lives. Their mean life satisfaction score is 5.9 (out of a total possible of 7). 72 per cent of them ticked one of the two categories representing greatest life satisfaction; about four percent selected one of the three categories reflecting least life satisfaction (results not reported). This matches findings from other surveys such as the BHPS (Bradshaw and Keung 2010; Scott and Chaudhary 2003).

The average household income of children in this age group amounts to £1,173 and eleven per cent of them count as income poor applying the conventional 50 per cent

of median income threshold. On average, children live in households where the adults score 0.18 on the HMDI; 33 per cent of them live in households where the adults would be considered extremely deprived since they score more than 0.25 on the HMDI. Extreme household deprivation and income poverty coincide for four per cent of the children.

Children tend to be less materially deprived than adults. On average, children score 0.06 on the CMDI, and 6 per cent of them live in household where the child deprivation would be considered extreme. One per cent of the children live in households where extrmee child deprivation and income poverty coincide.

Table 2
Population means for children aged 10-15 living in the UK, 2009/10.

Life satisfaction	5.9
Household income	1,173
Income poor	0.11
Household Material Deprivation Index (HMDI)	0.18
HMDI>0.25	0.33
Income poor & HMDI>0.25	0.04
Child Material Deprivation Index (CMDI)	0.06
CMDI>0.25	0.06
Income poor & CMDI>0.25	0.01
HMDI or CMDI >0.25	0.34

Source: *Understanding Society*, Wave 1, 2009-2010.

Table 3 throws more light at which of the things considered necessities for children are in fact enjoyed by children in the UK. The two most common items the children aged 10-15 do not have are holidays (31 per cent) and friends around for tea (23 per cent). The proportion of children going without is typically in the same ballpark as the proportion who cannot afford an item. Differences exist items relating to the cultural and social sphere. Here, children appear more likely to not want things rather than not being able to afford them (e.g., hobbies and friends around for tea).

Table 3
Availability of individual items contained in the Child Material Deprivation Index to children aged 10-15, and all households with children. Population estimates for the UK 2009/10.

CMDI component	% of children aged 10-15 who		% of households with children who do have
	do not have	cannot afford	
holidays	0.31	0.28	0.63
own bedroom	0.12	0.11	0.83
leisure equipment	0.08	0.06	0.86
celebrations	0.03	0.03	0.92
swimming	0.14	0.09	0.60
a hobby	0.12	0.06	0.76
friends around	0.23	0.05	0.70
toddler group	0.01	0.01	0.32
school trips	0.05	0.04	0.67

Source: *Understanding Society*, Wave 1, 2009-2010.

Bivariate associations with child life satisfaction

Table 4 compares the characteristics of children who report high life satisfaction with those who do not, and broken down by those characteristics of children that have been suggested to influence life satisfaction.[12] For this output we separated children into those 72 percent of the sample reporting high life satisfaction (i.e., those who ticked one of the two boxes representing greatest happiness) and those reporting low(er) life satisfaction (i.e., those who ticked one of the five boxes representing least happiness).

The results suggest that children who score higher on the CMDI are overrepresented among the unhappier children; the same is true for HMDI, but there is no clear pattern in the association with household income group. Associations with socio-demographic characteristics suggest that the older children are somewhat overrepresented among the unhappy children, older females in particular. There is no association with UK-country of residence, ethnicity or the number of children in the household. A clear pattern emerges with respect to the family-living context. Children who live with both parents are overrepresented among the happier children, and underrepresented in this group when living in a step- or lone parent family, or with neither of the parents.

[12] The output focuses on material well-being and basic socio-demographic characteristics. For results on associations with school characteristics, belonging and health, see Appendix 1.

Table 4
Bivariate associations with material well-being and demographic indicators.

	Life satisfaction			
	low	***high***	***p-value****	***Total***
Quintile group of household income				
bottom quintile	20.7	22.0		21.6
Q2	27.8	25.5		26.1
Q3	23.4	20.8		21.5
Q4	17.0	18.9		18.3
top quintile	11.2	12.9	(0.036)	12.4
Quintile group of HMDI				
bottom quintile	13.2	15.0		14.5
Q2	12.1	14.8		14.0
Q3	13.5	16.1		15.3
Q4	21.4	21.5		21.5
top quintile	39.8	32.6	(0.000)	34.7
Quintile group of CMDI				
bottom quintile	12.2	14.0		13.5
Q2	12.0	13.6		13.2
Q3	12.9	13.1		13.1
Q4	9.0	13.9		12.4
top quintile	54.0	45.4	(0.000)	47.9
Aged 10-12				
no	56.9	47.8		50.5
yes	43.1	52.2	(0.000)	49.5
Female				
no	47.6	50.6		49.7
yes	52.4	49.4	(0.059)	50.3
Female aged 10-12				
no	79.6	73.6		75.4
yes	20.4	26.4	(0.000)	24.6
Country of residence				
England	86.8	83.7		84.6
Wales	3.7	4.8		4.5
Scotland	5.6	6.9		6.6
Northern Ireland	3.9	4.5	(0.057)	4.3
British/Irish White				
no	36.1	35.7		35.8
yes	63.9	64.3	(0.807)	64.2
Family type				
Standard family	51.0	62.7		59.3
Step-family	13.3	9.6		10.7
Single mom	29.8	23.9		25.6
Single dad/Other	6.0	3.9	(0.000)	4.5
Number of children in household				
One	30.5	28.7		29.2
Two children	38.2	41.1		40.3
Three children	18.8	20.1		19.7
Four or more children	12.5	10.1	(0.026)	10.8

Source: *Understanding Society*, Wave 1, 2009-2010.

Multivariate regression analysis

Table 5 reports the results of multivariate Ordinary-Least-Squares (OLS) regressions on child life satisfaction. Models 1 through 9 test different combinations of entering material well-being indicators; *A* –versions include only the respective indicators of material well-being while *B*-versions also include controls for age, sex, ethnicity, country and family living context.[13] The results allow us to assess a number of different aspects. First, by comparing models 1, 2 and 3 (*A* and *B* versions), we can see whether the hypothesis is supported that household income is not, household material deprivation somewhat, and child material deprivation crucially important for child life satisfaction. Second, by comparing results when we include the material deprivation indices where individual items are not weighted (columns three and four) with models where individual items are weighted (columns five and six), we can see whether deprivation hurts more the more people are not deprived of the things the parents cannot afford to have for themselves, or for their child(ren). Last but not least, comparing the *A* and *B* versions of the models, we can establish whether the associations are robust to inclusion of basic socio-demographic characteristics.

The results lend support to our leading hypotheses. Household income is not associated with child life satisfaction in any of the models we estimated. By contrast, there are robust negative associations with household and child material deprivation in all models. Moreover, the negative association with child material deprivation is more marked than the association with household material deprivation. A critical view may be that the two deprivation indicators measure the same underlying construct and should, therefore, not be included in the same model. However, whilst the correlation between the two indices is 0.64, and standard errors increase somewhat when both measures are included simultaneously, the coefficients on both measures remain statistically significant.

[13] For the complete list of basic socio-demographic characteristics, see Table 4.

Table 5
Testing different specifications for entering household income, household and child material deprivation. Ordinary Least-Squares regressions (N=4,419).

Model	*Coefficients*					*R2*
	Household income[#]	*Items not weighted*		*Items weighted*		
		HMDI	*CMDI*	*HMDI*	*CMDI*	
1A	0.60					0.001
	(0.146)					
2A		-0.43***				0.011
		(0.000)				
3A			-0.81***			0.010
			(0.000)			
4A	-0.29	-0.45***				0.011
	(0.492)	(0.000)				
5A	-0.07		-0.82***			0.010
	(0.866)		(0.000)			
6A	-0.37	-0.29**	-0.47*			0.013
	(0.387)	(0.006)	(0.031)			
7A	-0.28			-0.63***		0.011
	(0.502)			(0.000)		
8A	-0.06				-1.14***	0.010
	(0.894)				(0.000)	
9A	-0.36			-0.43**	-0.64*	0.013
	(0.390)			(0.005)	(0.033)	
1B	0.13					0.028
	(0.759)					
2B		-0.36***				0.035
		(0.000)				
3B			-0.76***			0.036
			(0.000)			
4B	-0.48	-0.39***				0.035
	(0.262)	(0.000)				
5B	-0.35		-0.78***			0.036
	(0.422)		(0.000)			
6B	-0.54	-0.22*	-0.53*			0.037
	(0.214)	(0.046)	(0.013)			
7B	-0.48			-0.55***		0.035
	(0.268)			(0.000)		
8B	-0.33				-1.08***	0.036
	(0.440)				(0.000)	
9B	-0.53			-0.32*	-0.72*	0.037
	(0.216)			(0.034)	(0.014)	

Notes: [#] Equivalised and increased by £318.01, in log form.
Significant at *** 99%, ** 95%, * 90%.
Source: *Understanding Society*, Wave 1, 2009-2010.

Comparison of models reported in columns three and four with those reported in columns five and six suggests that child life satisfaction suffers more when their family goes without those things that are enjoyed by a greater share of the population; the effects are larger and the differences are statistically significant. This is true irrespective of whether adults experience this deprivation (HMDI measures), or the children (CMDI measures). The associations are robust to inclusion of basic socio-demographic characteristics, although the effects are, as we might have expected, somewhat attenuated. We also tested a number of alternative specifications including whether the family's income is below the poverty line, lacks more than 25 per cent of the household- and or child-related items others enjoy, and whether extreme household and child material deprivation coincide (i.e., HMDI and CMDI greater 0.25). None of this yielded statistically significant associations (results not reported here).

Table 6 shows the complete set of results for our preferred model 9B, and then breaks down the child material deprivation index into its individual components, allowing us to investigate which items included in the CMDI make a difference to child life satisfaction. To see whether there is an effect on child life satisfaction of not having or doing what others perceive as necessary, rather than the family not being able to afford this, we also combined the responses 'we cannot afford this' and 'children do not need/want this' to a new category, named 'children do not have/do this' (see columns 6 and 7, Table 4).

A number of things stand out from this analysis. First, basic socio-economic characteristics are important to life satisfaction. Whilst there is no general association with gender or age, the younger cohort of females, i.e., those aged 10 to 12, are more satisfied with their lives than the rest. Living in Wales is associated with greater happiness than living in England, and there is no association with ethnicity or the number of children in the household. The family living context, however, appears to impact hugely on child life satisfaction, living with both biological parents being associated with the greatest happiness.

Table 6

Predictions of child life satisfaction. Child material well-being marked by Child Material Deprivation Index (Model 9B), not being able to afford individual components of CMDI (Model 10), and not having individual components of CMDI (Model 11).

	Model (9B)		*Model (10)*		*Model (11)*	
	Coeff.	*S.E.*	*Coeff.*	*S.E.*	*Coeff.*	*S.E.*
Household income (log)	-0.53	(0.216)	-0.48	(0.269)	-0.65	(0.129)
Household Material Deprivation Index	-0.32*	(0.034)	-0.31	(0.061)	-0.26	(0.089)
Child Material Deprivation Index	-0.72*	(0.014)				
Child material deprivation items						
holidays			-0.07	(0.478)	-0.10	(0.252)
own bedroom			0.10	(0.225)	0.07	(0.348)
leisure equipment			-0.18	(0.197)	-0.12	(0.248)
celebrations			0.02	(0.883)	-0.06	(0.668)
swimming			0.03	(0.811)	0.09	(0.497)
a hobby			-0.20	(0.143)	-0.30**	(0.006)
friends around			-0.33*	(0.024)	-0.25***	(0.000)
toddler group			0.63	(0.519)	0.60	(0.532)
school trips			-0.11	(0.611)	-0.26	(0.141)

(continues next page)

Table 6
(continued)

	Model 9B		Model (10)		Model (11)	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Aged 10-12	0.05	(0.345)	0.05	(0.311)	0.04	(0.453)
Female	-0.16**	(0.002)	-0.16**	(0.003)	-0.16**	(0.002)
Female aged 10-12	0.29***	(0.000)	0.29***	(0.000)	0.29***	(0.000)
Country (base: England)						
Wales	0.22*	(0.030)	0.21*	(0.038)	0.21*	(0.039)
Scotland	0.10	(0.235)	0.10	(0.238)	0.09	(0.255)
Northern Ireland	-0.01	(0.954)	0.01	(0.943)	-0.00	(0.975)
British/Irish White	-0.08	(0.095)	-0.07	(0.109)	-0.08	(0.086)
Family type (base: Two parent family)						
Step family	-0.27***	(0.000)	-0.28***	(0.000)	-0.27***	(0.000)
Single mom family	-0.14**	(0.005)	-0.14**	(0.007)	-0.13**	(0.008)
Single dad/Other	-0.42***	(0.001)	-0.42***	(0.000)	-0.43***	(0.000)
Number of children in household (log)	-0.02	(0.593)	-0.05	(0.275)	-0.05	(0.221)
Constant	11.21**	(0.006)	10.65**	(0.009)	12.40**	(0.002)
Number of observations	4,419		4,419		4,419	
R-squared	0.037		0.041		0.047	

Significant at *** 99%, ** 95%, * 90%.
Source: *Understanding Society*, Wave 1, 2009-2010.

Second, there does not appear to be a strong association with child life satisfaction and individual components of the CMDI. The only thing that seems to matter in its own right is whether or not the family can afford that the child has friends around for tea at least fortnightly ($\beta = 0.33$). Third, the general pattern also holds when we ignore whether the family can afford this but focus instead on whether or not the child has this.

We were then interested in seeing whether the results are also robust to including further indicators that tab into other aspects of live that have been suggested to influence life satisfaction. We therefore added a whole range of further indicators intended to absorb heterogeneity in school contexts, the extent to which children are integrated into society and have a sense of belonging, as well as their health.

The results of this exercise, reported in Table 7, suggest that these factors are very important for child life satisfaction. For example, going to schools where others' misbehaving is no problem (compared to one where this problem is predominant) is associated with an increase of 0.5 points in child life satisfaction. They are also happier if they have a religious affiliation ($\beta = 0.17$) and have a greater number of friends ($\beta = 0.07$). Whilst having access to Internet at home and using it on a daily basis is associated with greater happiness, using social websites for more than an hour is associated with reductions in happiness. Last but not least, healthier life-styles are positively associated with child life satisfaction. Not eating five portions of fruit and vegetables on a typical day and eating fast food on most days are associated with a reduction in life satisfaction of 0.35 and 0.71 points, respectively.

These life-style characteristics alone explain 8 per cent of the variance in satisfaction with life, whilst socio-demographic characteristics only explain 1 per cent, see Appendix 2. Material well-being indicators, on the other hand, explain 3 percent of the variance when considered alone, see Table 4, Model 9A. When all three blocks of control variables are included simultaneously, however, the association with material well-being is attenuated, while the association with basic characteristics is robust. In particular, the association with HMDI is statistically not significant in this model. The association with CMDI remains statistically significant.

Table 7
Comprehensive life satisfaction model. OLS regression.

Population characteristic	Model (12)	
	Coeff.	S.E.
Household income (log)	-0.71	(0.086)
HMDI	-0.19	(0.173)
CMDI	-0.70*	(0.013)
Aged 10-12	0.02	(0.656)
Female	-0.14**	(0.010)
Female aged 10-12	0.24***	(0.001)
Country (base: England)		
Wales	0.28**	(0.002)
Scotland	0.13	(0.091)
Northern Ireland	-0.05	(0.588)
British/Irish White	-0.04	(0.364)
Family type (base: Two parent family)		
Step family	-0.18**	(0.008)
Single mom family	-0.07	(0.117)
Single dad/Other	-0.32**	(0.004)
Number of children in household (log)	-0.02	(0.654)
Other misbehave at school (base: most classes)		
less than most, more than half the classes	0.22***	(0.000)
about half the classes	0.24***	(0.000)
now and then/not a problem	0.50***	(0.000)
Number of close friends (log)	0.07***	(0.000)
Has religion	0.17***	(0.000)
Uses Internet at home each day	0.13***	(0.001)
Uses social websites >1hr each day	-0.13**	(0.002)
Low fruit/vegetables consumption	-0.35***	(0.001)
High fast food consumption	-0.71**	(0.001)
Does sports at least once a week	0.29**	(0.002)
Constant	12.11**	(0.002)
Number of observations	4,419	
R-squared	0.102	

Significant at *** 99%, ** 95%, * 90%.
Source: *Understanding Society*, Wave 1, 2009-2010.

Conclusion

Child poverty rates in the UK have been falling in the decade 1998/9 to 2008/9, according to conventional household-income based measures of child poverty. Given increases in income may not directly translate into more investment in children, it is debateable, however, that improvements on this measure indicate real

improvements in children's quality of life. A number of organisations, including the UK government department charged with delivering income maintenance and social security policies have, therefore, introduced new measures of child poverty to help target effective policies that make a real difference to children's lives.

An increasingly popular way to assess what makes a real difference to people's lives is to show its relation to life satisfaction. In this framework, the aim of this paper was to explore empirically whether household income, household material deprivation and child material deprivation are associated with child life satisfaction.

Focussing on a representative sample of children aged 10-15, participating in *Understanding Society*, the new UK Household Longitudinal Study (UKHLS), we found that family income and conventional income-based measures of poverty are *not* associated with child life satisfaction which implies that improvements on this child poverty measure may not represent real improvements in quality of life *as they are perceived by children themselves*. By contrast, life satisfaction in children is lower the more things the adult members of their household are materially deprived of, and the association is more marked if they themselves are deprived of things other children do enjoy.

Different aspects may contribute to this finding. Whilst it is difficult for children to evaluate how much income their family has, they will likely notice when the lack of financial resources becomes visible, e.g., if there is not enough money to keep the home in a decent state of repair or if major electrical appliances cannot be replaced when broken. This notion is also supported by the empirical finding that there is also a negative association between child life satisfaction and the material deprivation affects that affects them directly, i.e., when the family cannot afford for their child(ren) to have or do things children should be able to enjoy, according to national conventions. Moreover, children appear to be sensitive to how severe their material deprivation is. We find that children's life satisfaction is more closely associated with material well-being indicators if they or adult members of their family are excluded from things that are enjoyed by a greater share of the population.

The findings suggest that the new material deprivation measures of child poverty are better suited to track real improvements in children's lives than conventional

income-based poverty measures. However, whilst some factors associated with 'quality of life' can be directly influenced by policy choices (the income distribution in particular) this will be more difficult for multidimensional constructs such as child material deprivation. This is particularly true since none of the items included in the CMDI was associated with life satisfaction in its own right. The only exception was having friends around for tea, which was, however, related more to choice, i.e., the parent claims the child does not want this, rather than the family not being able to afford this. It would be difficult for government to influence this.

A further complication arises from that the family's material situation can also affect children's life satisfaction more indirectly, e.g., through the kind of food children consume, the range of leisure activities they can undertake, the quality of neighbourhoods and schools they are exposed to, and, perhaps most importantly, through the socio-emotional and psychological effect on the relationships between family members (Kempson 1996). We included in our analysis a range of these aspects (leaving out only the child's socio-emotional quality of relationships with other family members), and this attenuated the association with material well-being. Whilst the pure income effect could be estimated with more precision (compared to the baseline model), the effect of household material deprivation was not statistically significant when we controlled for variation in school contexts, unhealthy eating habits and indicators of friendship and belonging.

Currently the data from *Understanding Society* do not allow us to include in our comprehensive life satisfaction model for children a great deal of objective markers of the contexts in which children grow up. For instance, when children report that others misbehaving at school is not much of a problem in their school it may well be that this is true for their school compared to other schools in the country (in which case government may want to target resources on these schools). The account may also be tainted, however, by children with a more positive outlook on life viewing interruptions by others as less of a problem.

Once planned data linkages to administrative health records and administrative education records have been undertaken, it will be possible, for instance, to tease out the effects on life satisfaction of objective differences in education and health.

Future analysis of child life satisfaction will also benefit from observing more of them[14] repeatedly over time. This is because people tend to overstate how satisfied they are with their lives when confronted with this type of question for the first (Frick, Goebel, Schechtman, Wagner, and Yitzhaki 2004) and because the longitudinal design will allow us to hold constant unobserved characteristics that may influence life satisfaction reports.

The use of life satisfaction to assess whether policies contribute to real improvements in people's lives is becoming a priority for public policy. Currently available results suggest that those interested in maximizing society's welfare should shift their attention from an emphasis on increasing consumption opportunities for families with children to an emphasis on increasing social contacts.

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[14] From Wave 2 onwards, *Understanding Society* will also include interviews with children aged 10-15 belonging to around 8,000 households participating in the British Household Panel Survey (BHPS).

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Appendix

Appendix 1

Bivariate associations between life satisfaction and characteristics marking the school context, belonging and health. Children aged 10-15.

	Life satisfaction			Total
	low	high	p-value*	
Extent others misbehave at school				
in most classes	35.6	23.2		26.8
less often, in more than half of classes	22.4	19.8		20.6
about half of classes	17.7	16.8		17.1
now and then/not a problem	24.3	40.2	(0.000)	35.6
Quintile group of number of close friends				
bottom quintile	35.9	29.5		31.4
Q2	9.0	11.0		10.4
Q3	20.5	22.1		21.6
Q4	20.2	22.6		21.9
top quintile	14.6	14.8	(0.000)	14.8
Has religion				
no	45.5	36.5		39.1
yes	54.5	63.6	(0.000)	60.9
Uses Internet at home every day				
no	45.4	47.9		47.2
yes	54.6	52.1	(0.119)	52.8
Uses social websites > 1hrs per day				
no	59.4	67.9		65.4
yes	40.6	32.1	(0.000)	34.6
Low fruit/vegetables consumption				
no	91.6	96.4		95.0
yes	8.5	3.6	(0.000)	5.0
High fast food consumption				
no	97.1	98.7		98.2
yes	2.9	1.3	(0.000)	1.8
Does sport at least once a week				
no	9.6	5.3		6.6
yes	90.4	94.7	(0.000)	93.5
Total	29.1	70.9		100

Notes: * p-value of Chi^2 test of independence.
Source: *Understanding Society*, Wave 1, 2009-2010.

Appendix 2

Regression on life satisfaction of blocks of control variables, and whole set of control variables.

Population characteristic	Model(13)		Model(14)	
	Coeff.	S.E.	Coeff.	S.E.
Aged 10-12	0.05	(0.315)		
Female	-0.16**	(0.003)		
Female aged 10-12	0.28***	(0.000)		
Country (base: England)				
Wales	0.22*	(0.029)		
Scotland	0.12	(0.144)		
Northern Ireland	0.01	(0.900)		
British/Irish White	-0.04	(0.318)		
Family type (base: Two parent family)				
Step family	-0.29***	(0.000)		
Single mom family	-0.22***	(0.000)		
Single dad/Other	-0.44***	(0.001)		
Number of other children in household	-0.06	(0.144)		
Other misbehave at school (base: most classes)				
less than most, more than half the classes			0.23***	(0.000)
about half the classes			0.28***	(0.000)
now and then/not a problem			0.53***	(0.000)
Number of close friends (log)			0.07***	(0.000)
Has religion			0.18***	(0.000)
Internet use at home each day			0.13***	(0.001)
Uses social websites >1 hour each day			-0.19***	(0.000)
Low fruit/vegetables consumption			-0.37***	(0.000)
High fast food consumption			-0.77***	(0.001)
Does not play sports			0.34***	(0.000)
Constant	6.05***	(0.000)	5.13***	(0.000)
Number of observations	4,419		4,419	
R-squared	0.028		0.080	

Significant at *** 99%, ** 95%, * 90%.

Source: *Understanding Society*, Wave 1, 2009-2010.