

## Chapter 5

# THE KEY DETERMINANTS OF HAPPINESS AND MISERY

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This chapter is directed at policy-makers of all kinds—both in government and in NGOs. We assume, like Thomas Jefferson, that “the care of human life and happiness ... is the only legitimate object of good government.”<sup>1</sup> And we assume that NGOs would have similar objectives. In other words, all policy-makers want to create the conditions for the greatest possible happiness in the population and, especially, the least possible misery.

For this purpose they need to know the causes of happiness and misery. Happiness is caused by many factors, such as income, employment, health and family life and we need to ask, How much does a difference in each of these factors change the happiness of the person affected?

There is also a prior and related question that tries to explain the huge variation in levels of happiness within any country. The question is **How far does the variation in each of the factors (e.g. income inequality) explain the overall variation of happiness?**

In this chapter we concentrate mainly on the latter question.<sup>2</sup> We begin by looking at the role of current circumstances, and then (in the second part of the chapter) examine the influence of earlier childhood experience.

To be useful to policy-makers, any analysis of the causes of happiness and misery should satisfy at least three criteria, which have not generally been satisfied in the literature.

1. It must use a consistent measure of happiness throughout.
2. It must look at the effect of all the factors affecting happiness simultaneously, not one by one.
3. It must check whether the factors have the same effect on misery as they do on happiness

further up the scale. This is important if, as many believe, it is more important to reduce misery than to increase happiness by an equal amount further up the scale.

We have identified five major surveys of adults that make possible such analyses and also include meaningful measures of mental health. They cover the USA, Australia, Britain (two surveys) and Indonesia. We would like to have covered more countries, but the data are not yet there.

## Life Satisfaction

The measure of happiness that we use is life satisfaction. The typical question is “Overall how satisfied are you with your life these days?” measured on a scale of 0 to 10 (from ‘extremely dissatisfied’ to ‘extremely satisfied’).

This is a democratic criterion—we do not rely on researchers or policy-makers to give their own weights to enjoyment, meaning, anxiety, depression, and the like. Instead we leave it to individuals to evaluate their own well-being.

Moreover, policy-makers like the concept—and so they should. Our work shows that in European elections since 1970, the life satisfaction of the people is the best predictor of whether the government is re-elected—much more important than economic growth, unemployment or inflation (see Table 5.1).

The task is thus to explain how all the different factors affect our life satisfaction, entering them all simultaneously in the same equation.

**Table 5.1. Factors Explaining the Existing Government's Vote Share**  
(Partial correlation coefficients)<sup>3</sup>

Life satisfaction	0.64
Economic growth	0.36
Unemployment	-0.06
Inflation	0.15

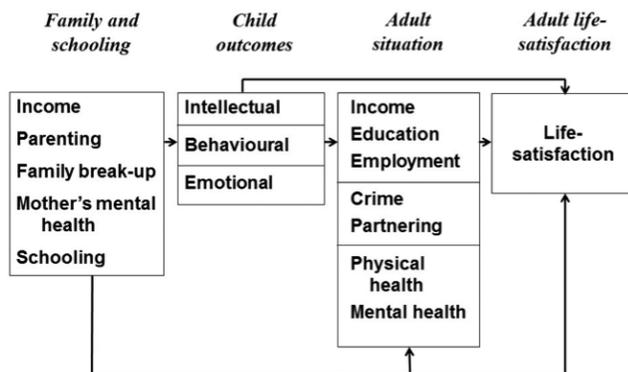
Source: Ward (2015).

Notes: Eurobarometer data on life satisfaction and standard election data for most European countries since the 1970s. The regressors include the government's vote share in the previous election. Life-satisfaction is from the latest survey before the election. Other variables are for the year of the election.

## The Life-Course

In explaining our current life satisfaction, there are of course **immediate** influences (our current situation) but also more **distant** ones going back to our childhood, schooling and family background. This diagram gives a stylised version of how our life satisfaction as an adult is determined.

**Figure 5.1. Determinants of Adult Life Satisfaction**



When we are adults, our happiness depends significantly on our adult situation—our economic situation (our income, education and employment), our social situation (whether we have a partner and whether we are involved in crime), and our personal health (physical and mental). These in turn depend partly on our development as children (intellectual, behavioural and emotional), which in turn depend on family and schooling. As our results show, there is scope for policy to affect a person's development at every age.

## The Effects of the Current Situation

We begin with the impact on adult happiness of the person's current situation, using the following data:<sup>4</sup>

**USA:** Behavioural Risk Factor Surveillance System (BRFSS) (sample aged 25+)

**Australia:** Household, Income and Labour Dynamics in Australia (HILDA) Survey (sample aged 25+)

**Britain:** British Cohort Study (BCS) (surveyed at ages 34 and 42)

**Britain:** British Household Panel Survey (BHPS) (sample aged 25+)

**Indonesia:** Indonesian Family Life Survey (IFLS) (sample aged 25+)

The factors we examine are

- Income: log household income per equivalised adult
- Education: years, except Indonesia (higher education versus none)
- Unemployment: measured as 'not unemployed'
- Partnership: married, or living as married
- Physical health: USA, Britain and Indonesia: number of illnesses; Australia: SF36, lagged one year
- Mental health: USA and Australia: has ever been diagnosed for depression or an anxiety disorder; Britain (BCS): has seen a doctor in the last year for emotional problems; Britain (BHPS): GHQ-12, lagged one year; Indonesia: replies to 8 questions.

Most earlier analyses of life satisfaction have not included mental health as a factor explaining life satisfaction. The reason is that both life satisfaction and mental health are subjective states, and there is therefore a danger that the two concepts are, at least in part, measuring the same thing. To omit mental health as a factor in the equation, however, is to leave out one of the most potent sources of misery, in addition to standard external causes like poverty, unemployment, and physical illness. The solution is, whenever possible, to record only mental illness that has been diagnosed or has led to treatment. That is our approach and it shows clearly that mental illness not caused by poverty, unemployment or ill health is a potent influence on life satisfaction.

**How far does each factor explain the variation in life satisfaction within the population?** Table 5.2 shows the results of regressing life satisfaction on all the factors simultaneously. The coefficients given are partial correlation coefficients, which show how far the independent variation of each factor explains the overall variation.<sup>5</sup>

**Table 5.2. How Adult Life Satisfaction is Predicted by Adult Outcomes**  
(Partial correlation coefficients)

	USA	Australia	Britain BCS	Britain BHPS	Indonesia
Income (log)	0.16 (.00)	0.09 (.01)	0.08 (.01)	0.09 (.01)	0.18 (.03)
Years of education	0.05 (.01)	-0.03 (.01)	0.03 (.01)	0.02 (.00)	0.05 (.01)
Not unemployed	0.05 (.00)	0.04 (.01)	0.03 (.01)	0.06 (.00)	0.02 (.01)
Partnered	0.34 (.01)	0.14 (.01)	0.21 (.01)	0.11 (.00)	0.04 (.01)
Physical illness	-0.05 (.00)	-0.17 (.01)*	-0.06 (.01)	-0.11 (.00)	-0.07 (.01)
Mental illness	-0.21 (.00)	-0.18 (.01)	-0.11 (.01)	-0.32 (.00)*	-0.07 (.01)
Female	0.08 (.00)	0.08 (.01)	0.11 (.02)	0.05 (.00)	0.07 (.01)
N	268,300	16,001	17,812	139,507	31,437

Sources: USA (BRFSS); Australia (HILDA); Britain (BCS); Britain (BHPS); Indonesia (IFLS).

Notes: See Appendix C. \* Lagged one year.

In all three Western countries, diagnosed mental illness emerges as more important than income, employment or physical illness. In Indonesia as well, mental health is important, though less so than income. In every country physical health is of course also important, but in no country is it more important than mental health.

Having a partner is also a crucial factor in Western countries, while in Indonesia it is less so, perhaps reflecting the greater importance of the extended family. Education has a positive effect in all countries (except Australia), yet it is nowhere near the most powerful explanatory factor on its own.<sup>6</sup> In every country, income is more important than education as such.

At this point a natural question is **Do different variables impact differently on life-satisfaction at**

**different points on the scale?** For example, how well does Table 5.2 explain whether a person is really unhappy? To answer this we identify in each country people in the lowest levels of happiness, which we call “In Misery.” Because happiness is measured in discrete units, the percentage identified as ‘In Misery’ varies from 5.6% in the USA to 13.9% in Indonesia.

We then run a standardised linear regression of the dummy variable ‘In Misery’ on the same explanatory variables as before.<sup>7</sup> The results are shown in Table 5.3, where they are compared with our previous results in Table 5.2 for the full range of life-satisfaction. The two sets of coefficients are remarkably similar. There is thus no evidence that income, mental health, or any other variable is any more important lower down the well-being scale than it is higher up.

**Table 5.3. Explaining the Variation of Life Satisfaction and of Misery Among Adults**  
(Partial correlation coefficients)

	USA		Australia		Britain BCS		Britain BHPS		Indonesia	
	Life Sat	Misery	Life Sat	Misery	Life Sat	Misery	Life Sat	Misery	Life Sat	Misery
Income (log)	0.16	-0.12	0.09	-0.09	0.08	-0.05	0.09	-0.07	0.18	-0.17
Years of education	0.05	-0.04	-0.03	-0.00	0.03	-0.02	0.02	-0.01	0.05	-0.06
Not unemployed	0.05	-0.06	0.04	-0.06	0.03	-0.03	0.06	-0.07	0.02	-0.03
Partnered	0.34	-0.19	0.14	-0.10	0.21	-0.11	0.11	-0.08	0.04	-0.04
Physical illness	-0.05	0.05	-0.17 *	0.16*	-0.06	0.05	-0.11	0.09	-0.07	0.07
Mental illness	-0.21	0.19	-0.18	0.14	-0.11	0.09	-0.32 *	0.26*	-0.07	0.08
Female	0.08	-0.06	0.08	-0.06	0.11	-0.06	0.05	-0.04	0.07	-0.06

Sources: USA (BRFSS); Australia (HILDA); Britain (BCS); Britain (BHPS); Indonesia (IFLS)  
Notes: See Appendix C. \* Lagged one year.

In many ways a more vivid way of analysing misery is to make all the right hand variables into discrete variables, such as poor/non-poor or sick/non-sick. This enables us to give an exact answer to the question **If we could eliminate each problem, how much could we reduce misery?**

The different risk factors are now as follows:

**Poor:** below 60% of the median household income

**Uneducated:** USA and Indonesia: no higher education; Australia and Britain (BHPS): less than 10 years of education; in Britain (BCS): no qualification

**Unemployed**

**Not partnered**

**Physical illness:** below the current 20th percentile of physical health

**Depression/anxiety:** diagnosed/treated except Britain (BHPS) and Indonesia (below the 20th percentile).

We then estimate an equation of the form

$$Is\ miserable\ (1,0) = a_1 Is\ poor\ (1,0) + a_2 Is\ uneducated\ (1,0) + etc. \quad (1)$$

The results are given in Table 5.4, column (1). This shows that in the USA, for example, a person who is poor is 5.5 percentage points more likely than otherwise to be miserable. By contrast someone with depression or anxiety is 10.7 percentage points more likely to be miserable.

So how much could we reduce the prevalence of misery in the USA if we could miraculously abolish depression and anxiety disorders without changing anything else? Well, around 22% of the population have this diagnosis. If they were all cured, we could reduce the percentage of the population in misery by 0.107 times 22%. This is 2.35% of the whole population (see column 3). That is large portion of the total 5.6% who are in misery.

By contrast, eliminating poverty in the USA reduces misery by 1.7% points, unemployment by 0.3% and physical illness by 0.5% out of the total 5.6% in misery. Taken together, those three factors barely make as much difference as mental illness on its own.

The pattern in Australia is very similar, but with more problems coming from physical illness. In Britain the role of poverty is less than it is in the USA, but the role of mental health as large or larger.

Finally in Indonesia, eliminating mental illness again reduces misery by more than reducing poverty does. Further, increased education would also greatly help. In all countries there would be much less misery if fewer people were living on their own.

This set of results is repeated, for effect, in Figure 5.3.

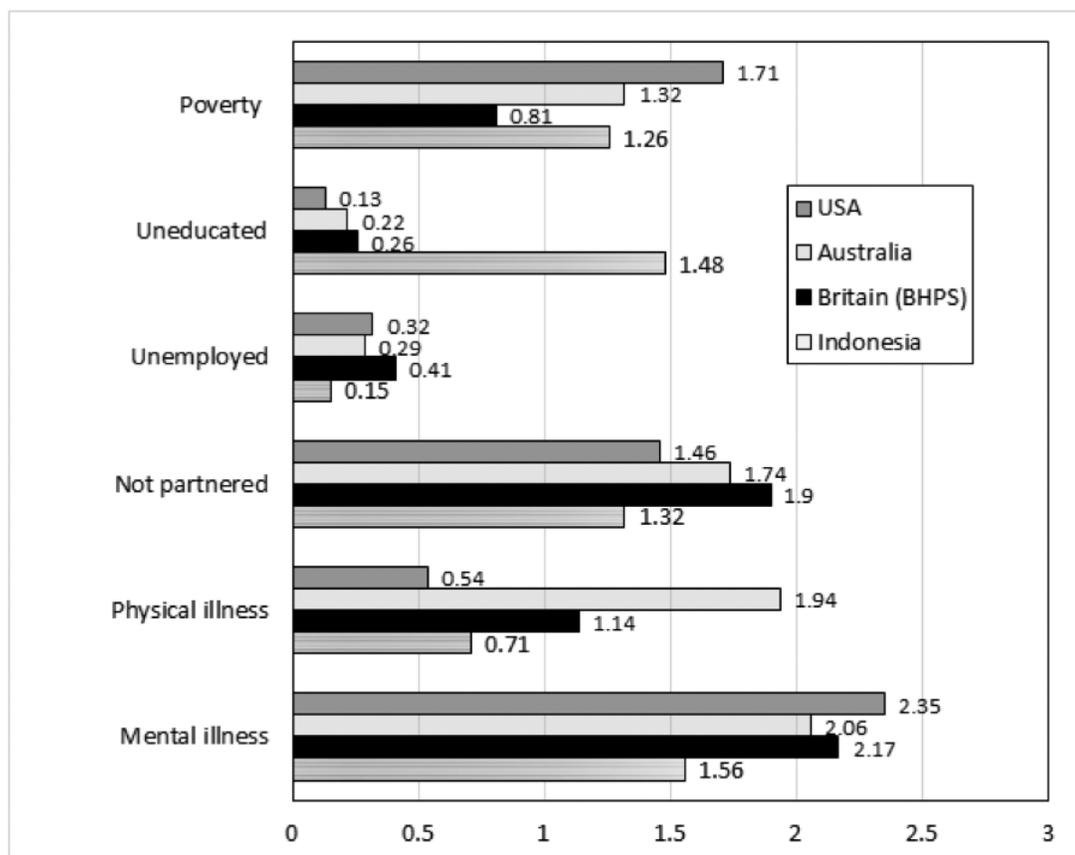
**Table 5.4. How Would the Percentage in Misery Fall if Each Problem Could be Eliminated on its Own?**

	$\alpha$ -coefficient	×	Prevalence (%)	=	$\alpha \times$ Prevalence	Total in misery (% points)
<b>USA</b>						
Poverty (below 60% of median income)	0.055	×	31	=	1.71	
Uneducated (no higher education)	0.012	×	11	=	0.13	
Unemployed	0.079	×	4.0	=	0.32	5.6
Not partnered	0.034	×	43	=	1.46	
Physical illness (bottom 20%)	0.027	×	20	=	0.54	
Depression or anxiety, diagnosed	0.107	×	22	=	2.35	
<b>Australia</b>						
Poverty (below 60% of median income)	0.044	×	30	=	1.32	
Uneducated (below 10 years of educ.)	0.017	×	13	=	0.22	
Unemployed	0.096	×	3.0	=	0.29	7.0
Not partnered	0.047	×	37	=	1.74	
Physical illness lagged (bottom 20%)	0.097	×	20	=	1.94	
Depression or anxiety, diagnosed	0.098	×	21	=	2.06	
<b>Britain (BCS)</b>						
Poverty (below 60% of median income)	0.025	×	30	=	0.75	
Uneducated (no qualification)	0.009	×	19	=	0.17	
Unemployed	0.059	×	2.2	=	0.13	8.0
Not partnered	0.049	×	47	=	2.30	
Physical illness (bottom 20%)	0.017	×	20	=	0.34	
Has seen a doctor for emotional health problems in last year	0.155	×	14	=	2.17	
<b>Britain (BHPS)</b>						
Poverty (below 60% of median income)	0.028	×	29	=	0.81	
Uneducated (below 10 years of educ.)	0.026	×	10	=	0.26	
Unemployed	0.152	×	3.8	=	0.41	9.9
Not partnered	0.053	×	36	=	1.90	
Physical illness (bottom 20%)	0.057	×	20	=	1.14	
Emotional health symptoms lagged (bottom 20%)	0.205	X	20	=	4.10	
<b>Indonesia</b>						
Poverty (bottom 20%)	0.063	X	20	=	1.26	
Uneducated (no qualification)	0.055	X	27	=	1.48	
Unemployed	0.152	X	01	=	0.15	13.9
Not partnered	0.044	X	30	=	1.32	
Physical illness (bottom 10%)	0.071	X	10	=	0.71	
Emotional health symptoms (bottom 20%)	0.078	X	20	=	1.56	

Sources: USA (BRFSS); Australia (HILDA); Britain (BCS); Britain (BHPS); Indonesia (IFLS).

Notes: People aged 25+, except for Britain (BCS) where people aged 34 and 42. The first column consists of regression coefficients in equation (1). For Indonesia the bottom quintile of the number of physical illnesses had much less explanatory power than the composite variable used for Indonesia throughout this chapter—see Online Annex. See also Appendix C.

**Figure 5.3. How Would the Percentage in Misery Fall if each Problem Could be Eliminated on its Own?**



Sources: USA (BRFSS); Australia (HILDA); Britain (BHPS); Indonesia (IFLS)

From Figure 5.3 we can see how much misery could be reduced if we eliminated each of the risk factors, one at a time. But clearly none of them can be totally eliminated. Moreover the cost of reducing them is also relevant. So a natural question to ask in each country is **If we wanted to have one less person in misery, what is the cost of achieving this by different means?** We attempt a very rough calculation of this for Britain in Table 5.5. As Table 5.5 shows, it costs money to reduce misery, but the cheapest of the policies is treating depression and anxiety disorders.

**Table 5.5. Average Cost of Reducing the Numbers in Misery, by One Person. Britain**

	£k per year
<b>Poverty.</b> Raising more people above the poverty line	180
<b>Unemployment.</b> Reducing unemployment by active labour market policy	30
<b>Physical health.</b> Raising more people from the worst 20% of present-day illness	100
<b>Mental health.</b> Treating more people for depression and anxiety	10

Sources available from authors.

## The Effects of Childhood

Importantly, many of the problems of adulthood can of course be traced back to childhood and adolescence. **So which aspects of child development best predict whether an adult is satisfied with life?** Answering this question requires cohort data which are available for many fewer countries. Since Britain is rich in such data, we shall from now on use data on Britain only. We first use data from the British Cohort Study, which has followed children born in 1970 right up to today.

Three key dimensions of child development are at work. One is intellectual development, which we measure by the highest qualification that the individual achieved. This is turned into a single variable using weights derived by regressing wages on highest qualification. A second dimension is behavioural, measured in the Rutter behaviour questionnaire by 17 questions answered by the mother. The third dimension is emotional health based on a malaise inventory (22 questions answered by the child and 8 by the mother).

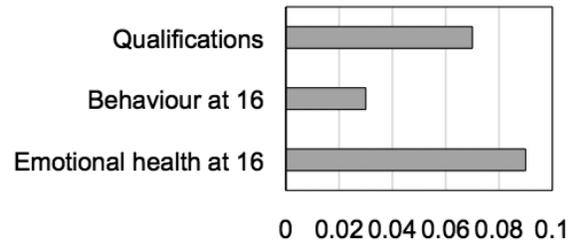
We now regress adult life-satisfaction on these three variables, as well as on family background. As Figure 5.4 shows, the strongest predictor of a satisfying adult life is not qualifications but a combination of the child's emotional health and behaviour.<sup>8</sup> These findings have direct relevance to policy.

### But what, in turn, determines child development?

To study this we use a very detailed survey of all children born in the English County of Avon in 1991/2 who have been followed intensively up until today. Our aim is to explain the three measures of child development. Intellectual development is now measured by GCSE scores. The emotional health of the child, however, has particular significance, since it is also the best measure we have of the child's own quality of life—it is a final product as well as an input into the resulting adult.

**Figure 5.4. How Adults' Life Satisfaction is Affected by Different Aspects of their Development as Children: Britain.**

(Partial correlation coefficients)



Sources: Britain (BCS)

Notes: Qualifications is the highest qualification that the person achieved. Behaviour at 16 is reported by the mother, and emotional health at 16 is reported by mother and child.

Clearly both parents and schools affect a child's development. **How, first, do parents affect their children's development?** We have a mass of information about parents, and in Table 5.6 we show the family variables that have the main effects. As is well known, family income has a substantial effect on a child's academic performance, but a much smaller effect on the child's emotional health and behaviour. Father's unemployment has adverse effects, but is not that common. What is the effect if the mother goes out to work? If this happens in the first year, there are on average very small negative effects. If the mother works in subsequent years, however, it is positively beneficial for academic performance and further does no measured harm to the child's emotional health.

As regards "parenting style," parental engagement and involvement with their children (e.g. in reading and play) is immensely valuable, while aggressive parenting (hitting or shouting) only exacerbates bad behaviour. Conflict between parents is especially disadvantageous for the behaviour of the children. The worst thing of all for children's emotional health and behaviour is a mother who is mentally ill. Indeed, the survey suggests strongly that the mother's mental health matters more than the father's.<sup>9</sup>

**Table 5.6. How Child Outcomes at 16 are Affected by Different Factors: Britain.**  
(Partial correlation coefficients)

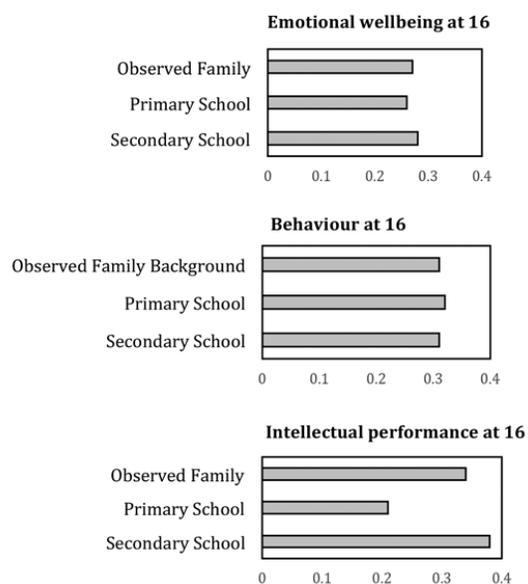
	Emotional	Behavioural	Intellectual
Family income	0.07 (.02)	0.08 (.02)	0.14 (.01)
Father's unemployment	-0.04 (.03)	-0.00 (.02)	-0.03 (.01)
Mother worked in 1st year	-0.02 (.02)	-0.01 (.02)	-0.02 (.01)
Mother worked thereafter	-0.01 (.02)	-0.05 (.02)	0.04 (.01)
Parents' involvement	0.04 (.02)	0.05 (.02)	0.02 (.01)
Aggressive parenting	-0.03 (.02)	-0.12 (.02)	-0.01 (.01)
Family conflict	-0.04 (.02)	-0.14 (.02)	-0.01 (.01)
Father's mental health	0.04 (.02)	-0.00 (.02)	-0.00 (.01)
Mother's mental health	0.16 (.02)	0.17 (.02)	0.03 (.01)

Source: Britain (ALSPAC)  
Note: See Appendix C.

Clearly, family matters. **What about the effect of schools?** In the 1960s, the Coleman Report in the US told us that parents mattered more than schools.<sup>10</sup> Since then the tide of opinion has turned. Our data strongly confirm the importance of the individual school and the individual teacher. This applies equally to the academic performance of the pupils and to their happiness.

In Figure 5.5, we look at child outcomes at 16 and show how they are explained. The top bar shows the combined effect of all observed family factors (treated as a single weighted variable). The next bar shows the enduring effect of the primary school a child went to (again a single aggregate of dummy variables), and the last is the effect of the secondary school.<sup>11</sup> These are big effects.

**Figure 5.5. How Child Outcomes at 16 are Affected by Family and Schooling: Britain.**  
(Partial correlation coefficients)



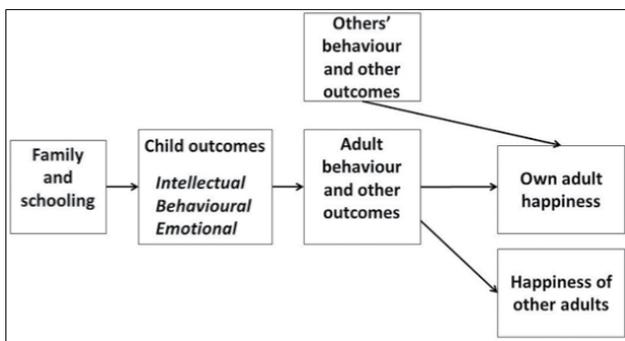
Source: Flèche (2016). ALSPAC data.  
Notes: See Appendix C.

## Behaviour and Crime

We have so far focussed exclusively on the happiness of the individual person being studied. But each of us also has a marked impact on the happiness of other people. This social impact has been given insufficient weight in much of the literature on happiness, although it is well known that how others behave is a major influence on our own happiness.

So we must modify Figure 5.1 to take this into account (see Figure 5.6). Unfortunately, however, we have only limited ability to study this important determinant of the well-being of human populations. One route is by inter-country comparisons of the type developed in Chapter 2 of this report. The other is by studying the effects of crime on individual happiness, and then investigating the determinants of criminality.

**Figure 5.6. The New Element: Behaviour**



**Table 5.7. How the Number of Crimes Committed by an Individual up to Age 34 is Affected by Child Development: Britain.**

Qualifications (1 SD improvement)	-0.87
Behaviour (1 SD improvement)	-0.25
Emotional health (1 SD improvement)	-0.04

Source: Britain (BCS).

Notes: Controls for family background, gender and age dummies.

Using data on local crime rates from police records, together with the corresponding local happiness data from the British Household Panel Survey, we can infer that each crime on average reduces the aggregate life-satisfaction of the local population by the equivalent of 1 point-year for one person.

If we then look at how child development affects crime, we find that the number of crimes a person commits is affected by child development, as shown in Table 5.7. Thus more education has a major benefit through the resulting reduction of crime. From one standard deviation of qualifications comes a one-off benefit to the rest of the population of just under 1 point-year of life-satisfaction ( $1 \times 0.87$ ). This can be compared to the gain to the educated individual of 0.10 point-year in every year of their life, as discussed earlier. Thus the crime-reducing effect of education adds proportionately little to the total social returns to education.

## Social Comparisons

There remains the elephant in the room—social comparisons. People are constantly amazed that aggregate happiness has not risen in the USA and many other countries, when incomes and educational levels have risen so much and when income and education are associated with greater individual happiness. This is the Easterlin paradox.

It is really no mystery, however.<sup>12</sup> There is much evidence that people compare their income with other people and, if others become richer, they feel less happy at any given level of income.<sup>13</sup> This is confirmed in the present study. Table 5.8 shows the effect of the average of log income in one's region, age-group and gender upon one's own happiness. In all three countries the negative effect of others' income is large, and any rise in overall income has little effect on overall life satisfaction. The same is true for education.

**Table 5.8. How Life Satisfaction (0-10) is Affected by Own Income, Comparator Income, Own Years of Education and Comparator Years of Education**  
(Partial correlation coefficients)

	Britain (BHPS)	Germany	Australia
Own income (log)	0.16 (.01)	0.26 (.01)	0.16 (.01)
Comparator income	-0.15 (.07)	-0.34 (.05)	-0.13 (.06)
Years of education	0.03 (.00)	0.05 (.00)	-0.01 (.00)
Comparator education	-0.09 (.02)	-0.05 (.01)	-0.03 (.01)

Notes: Robust standard errors in parentheses. Controls for self-employed, employed part time, unemployed, not in labour force, partnered, separated, widowed, parent, physical health, emotional health, female, age, age-squared, comparator unemployment, comparator partnership, year and region dummies.

## Conclusion

Policy-makers need to know the causes of happiness and misery. Some of these are factors that affect everyone in a society (see Chapter 2), while other vital factors differ across individuals. For the latter, policy-makers need to know what factors account for the huge variation across individuals in their happiness and misery (both of these being measured in terms of life-satisfaction).

Key factors include economic factors (such as income and employment), social factors (such as education and family life), and health (mental and physical). We use surveys from the USA, Australia, Britain and Indonesia to cast light on the relative importance of these various factors.

In all three Western societies, diagnosed mental illness emerges as more important than income, employment or physical illness. In Indonesia as well, mental health is important, though less so than income. In every country, physical health is also of course important. Yet in no country is it more important than mental health.

Having a partner is also a crucial factor in Western countries, while in Indonesia it is less so, perhaps reflecting the greater importance of the extended family. Education has a positive effect in all countries (except Australia) but it is nowhere near the most powerful explanatory factor on its own. In every country, income is more important than education as such.

Even so, household income per head explains under 2% of the variance of happiness in any country. Moreover it is largely relative income that matters, so as countries have become richer, many have failed to experience any increase in their average happiness. A similar problem relates to education—people care largely about their education relative to that of others.

What about the causes of misery? Do the same factors affect misery as affect life-satisfaction

across the whole range? The answer is yes, and the factors have the same ranking in explaining misery as in explaining life-satisfaction. In Table 5.4 we show a novel decomposition which illustrates how much misery could in principle be eliminated by eliminating either poverty, low education, unemployment, living alone, physical illness or mental illness. In all countries the most powerful effect would come from the elimination of depression and anxiety disorders, which are the main form of mental illness. This would also be the least costly way of reducing misery (Table 5.5).

While much could be done to improve human life by policies directed at adults, as much or more could be done by focussing on children. We examine this issue using British cohort data. We ask, Which factors in child development best predict whether the resulting adult will have a satisfying life? We find that academic qualifications are a worse predictor than the emotional health and behaviour of the child.

What in turn affects the emotional health and behaviour of the child? Parental income is a good predictor of a child's academic qualifications (as is well known), but it is a much weaker predictor of the child's emotional health and behaviour. The best predictor of these is the mental health of the child's mother.

Schools are also crucially important. Remarkably, which school a child went to (both primary and secondary) predicts as much of how the child develops as all the characteristics we can measure of the mother and father. This is true of what determines the child's emotional health, their behaviour and their academic achievement.

To conclude, within any country, mental health explains more of the variance of happiness in Western countries than income does. In Indonesia mental illness also matters, but less than income. Nowhere is physical illness a bigger source of misery than mental illness.

Equally, if we go back to childhood, the key factors for the future adult are the mental health of the mother and the social ambiance of primary and secondary school. The implications for policy are momentous.

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- 1 Jefferson (1809).
  - 2 The relation between these two questions is shown in Appendix A, which provides data from which the answers to the previous question can be calculated.
  - 3 The partial correlation coefficients are sometimes called the standardised regression coefficients. They are the  $\beta$ s in a regression where all variables are divided by their standard deviation. The overall explanatory power of the equation is given by

$$R^2 = \sum_i \beta_i^2 + \sum_i \sum_j \beta_i \beta_j r_{ij} \quad (i \neq j)$$

- 4 Details are in Appendix B and an online Annex at <https://tinyurl.com/WHR2017Ch5Annex>
- 5 See Note 3.
- 6 The total effect of education includes of course its effect via income and other channels. If income is excluded from the regression, the coefficient on education becomes USA 0.08, Australia 0.03, Britain BHPS 0.06, and Indonesia 0.06.
- 7 We thus estimate a linear probability model. Almost identical results are obtained from logit analysis.
- 8 The coefficient for the combination of the child's emotional health and behaviour is 0.101 (s.e. = 0.009), which compares with 0.068 (s.e. 0.008) for qualifications—a significant difference ( $p = 0.010$ ).
- 9 Presumably since she is more present. However the mother's mental health is measured 8 times up to when the child is 11, while the father's is only measured 3 times until the child is 2. To see if this matters, we also focused on explaining the child's emotional health at 5, using three observations on both parents' mental health. The difference between the effect of mother and father remained as large as it is in Table 5.6. The same occurred if we focussed on explaining the child's emotional health at 16, using only the first three observations on each parent's mental health.

The mother's mental health was measured using the Edinburgh Post Natal Depression Scale (EDPS), and the father's was tested using the Crown-Crisp Experiential Index.

- 10 Coleman et al. (1966).
- 11 The dependent variable is regressed on two sets of dummy variables, one for each primary school and one for each secondary school. The set of primary school variables is then turned into one composite variable using the coefficients on each dummy variable. The same is done for secondary schools.

- 12 For an earlier discussion of the Easterlin paradox, see WHR 2012, Chapter 3.
- 13 Clark et al. (2008); Layard et al. (2010).

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# APPENDIX

## Appendix A: Calculating The Absolute Impact of A Factor

The equations presented in this chapter are of the form

$$\frac{LS}{\sigma_{LS}} = \sum \beta_i \frac{X_i}{\sigma_i}$$

where  $\sigma$  measures the standard deviation of the variable. For cost-effectiveness analysis a policy-maker needs the coefficients  $a_i$  in the equation

$$LS = \sum \alpha_i X_i$$

Thus

$$\alpha_i = \beta_i \frac{\sigma_{LS}}{\sigma_i}$$

The tables in the text provide the  $\beta$ s. The following tables provide the  $\sigma$ s and the means.

### Standard deviations for Tables 5.2, 5.3 and 5.8

	USA	Australia	Britain BCS	Britain BHPS	Indonesia
Life satisfaction	0.62	1.49	1.90	2.36	0.80
Misery	0.22	0.26	0.27	0.35	0.35
Income (log)	0.82	0.88	0.74	1.22	7.86
Education	1.11	2.58	1.57	2.51	0.43
Not unemployed	0.20	0.21	0.14	0.21	0.08
Partnered	0.50	0.48	0.50	0.48	0.35
Physical illness	1.06	4.95	1.32	1.10	0.83
Mental illness	0.42	2.59	0.18	5.54	4.97
Female	0.50	0.50	0.50	0.50	0.50
Comparator income		0.40		1.07	
Comparator education		1.17		0.97	

### Means for Tables 5.2, 5.3 and 5.8

	USA	Australia	Britain BCS	Britain BHPS	Indonesia
Life satisfaction	3.40	7.90	7.39	6.97	3.32
Misery	0.06	0.07	0.08	0.10	0.14
Income (log)	9.99	7.51	9.55	6.42	15.75
Education	4.78	12.08	3.37	12.35	0.26
Not unemployed	0.96	0.67	0.97	0.96	0.99
Partnered	0.57	0.63	0.53	0.64	0.70
Physical illness	1.38	22.68	2.01	0.73	0.48
Mental illness	0.22	0.21	0.14	23.11	18.83
Female	0.50	0.53	0.52	0.55	0.51
Comparator income		7.64		6.22	
Comparator education		12.07		12.19	

## Appendix B: The Surveys Used

<https://tinyurl.com/WHR2017Ch5Annex>

<b>USA (BRFSS)</b>	<p><b>Behavioural Risk Factor Surveillance System (BRFSS)</b> Cross-sectional survey which includes a life-satisfaction question since 2005.</p> <p>In 2006, 2008, 2010, 2013, respondents were asked whether they have ever been diagnosed with depression or anxiety.</p> <p>Sample size = 270,000</p>
<b>Australia</b>	<p><b>Household Income and Labour Dynamics in Australia (HILDA) Survey</b> Household-based panel study which began in 2001. The panel members are followed over time and interviewed every year. Life-satisfaction is measured throughout.</p> <p>In 2007, 2009, 2013, respondents were asked whether they have ever been diagnosed with depression or anxiety.</p> <p>Sample size = 16,000</p>
<b>Britain</b>	<p><b>British Cohort Study (BCS)</b> British cohort data which began in 1970. The children are followed over time and interviewed at ages 5, 10, 16, 26, 30, 34, 38 and 42. A life satisfaction question has been included in the study from age 26.</p> <p>At ages 34 and 42, respondents were asked whether they have any physical health problems.</p> <p>Sample size = 18,000</p>
<b>Britain</b>	<p><b>British Household Panel Survey (BHPS)</b> Household-based panel study which began in 1991. The panel members are followed over time and interviewed every year. A life satisfaction question has been included in the study from 1996.</p> <p>Sample size = 140,000</p>
<b>Britain</b>	<p><b>Avon Longitudinal Study of Parents and Children (ALSPAC)</b> Near census English cohort study. The study recruited over 14,000 pregnant women residing in the Avon area in the UK with expected delivery dates between April 1991 and December 1992. The children have been followed almost every year since then.</p> <p>The study contains various measures of the family environment, schooling environment as well as indicators of the development of child well-being and skills over time.</p> <p>Sample size = 8,000</p>
<b>Indonesia (IFLS)</b>	<p><b>Indonesia Family Life Survey (IFLS)</b> Longitudinal survey in Indonesia.</p> <p>The fifth wave (IFLS-5) in 2014 includes a question on life satisfaction, emotional health and number of health conditions diagnosed by a doctor.</p> <p>Observations: 32, 000</p>

## Appendix C: Notes on Tables and Figures

### Table 2: How Adult Life-satisfaction is Predicted by Adult Outcomes

Robust standard errors are in parentheses. Controls for age, age-squared, region and year dummies. Australia and Britain (BHPS) also include comparison income, education, unemployment and partnership. Britain (BCS) also includes non-criminality, child outcomes at 16 and family background. Cross-section regressions using information from BCS respondents at ages 34 and 42. BHPS, HILDA, IFLS and BRFSS respondents at age 25+.

proportion of time mother worked thereafter, father's unemployment, mother's mental health, father's mental health, involvement, aggression, family conflict, parental separation, parents' education, mother's age at birth, and parents' marital status at birth. Controls for female child, ethnicity, first born child, number of siblings, low birth weight, and premature baby.

### Table 3. Explaining the Variation of Life-Satisfaction and of Misery Among Adults

Controls for age, age-squared, region and year dummies. Australia and Britain (BHPS), also include comparison income, education, unemployment and partnership. Britain (BCS) also includes non-criminality, child outcomes at 16 and family background. Cross-section regressions using information from BCS respondents at ages 34 and 42. BHPS, HILDA and BRFSS respondents at age 25+. Those included in misery are USA 1-2 (on scale 1-4); Australia 0-5 (on scale 0-10); Britain (BCS) 0-4 (on scale 0-10); Britain (BHPS) 1-3 (on scale 1-7); and Indonesia (IFLS) 1-2 (on scale 1-5).

### Table 6. How Child Outcomes at 16 are Affected by Different Factors: Britain.

Robust standard errors are in parentheses. Controls for parental separation, parents' education, mother's age at birth, parents' marital status at birth, female child, ethnicity, first born child, number of siblings, low birth weight, premature baby, and primary school and secondary school fixed effects.

### Figure 5. How Child Outcomes at 16 are Affected by Family and Schooling: Britain.

Family background include family income, proportion of time mother worked in first year,

# ONLINE APPENDIX

(CLARK, FLÈCHE, LAYARD, POWDTHAVEE, & WARD, THE KEY DETERMINANTS OF HAPPINESS AND MISERY)

[HTTP://WORLDHAPPINESS.REPORT/](http://worldhappiness.report/)

