HAPPINESS AND PERSONAL WEALTH

An updated research synthesis using an on-line findings archive [1]

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ABSTRACT

Question: How does personal wealth work out on ones happiness? Understanding of the effects of personal wealth on happiness is required for informed decision making in matters of saving and consumption.

Method: In order to answer the question of how and to what extent personal wealth relates to happiness, we take stock of the available research findings on this issue, covering 198 findings observed in 123 studies. We use a new method of research synthesis in which research findings are described in a comparable format and entered in an online findings archive, the 'World Database of Happiness', to which links are made from this text. This technique allows a condensed presentation of research findings while providing readers access to full details.

Results: We found mostly positive relationships between assets and happiness, and negative relationships between debt and happiness. The few longitudinal studies suggest a causal effect of wealth on happiness. We found little difference across methods used and populations studied. Together, the available research findings imply that building wealth will typically add to happiness. However, the average effect sizes are small with an average of 0.11 for total assets and -0.21 for total debts.

Keywords: life satisfaction, consumption, savings, assets, debt, wealth, research synthesis

[1] This paper is an extension of the book chapter: Jantsch, A. and R. Veenhoven (2019). Private Wealth and Happiness. A Research Synthesis Using an Online Findings-Archive. In: Brulé G., Suter C. (eds) Wealth(s) and Subjective Well-Being. Social Indicators Research Series, vol 76. Springer, Cham. This version reports 79 more findings observed in 51 more studies. Much of the introductory text is similar.

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1 INTRODUCTION

The concept of cardinal utility, in the tradition of Jeremy Bentham (1789 [2000]), is a notion that is reliant on introspection, and is fundamentally focused on welfare outcomes. This conceptual view is primarily concerned with the question of how much utility a person derives from a particular decision. Bentham equates 'utility' with 'happiness' but offered no indication of what measurements of happiness there could possibly be, so in this context it is interesting to look at happiness research which has become popular among economists over the last 40 years.

Today, happiness is measured in survey studies where people are asked about their life satisfaction and are required to record their answer on a numerical scale. This strand of research developed since the 1960s and has produced a lot of findings, including correlations with key variables in economics such as income and employment. The resulting data allows a view on the effects of economic choices on happiness, for instance whether or not to opt for early retirement at the cost of a lower income. Around the year 2000, this resulted in the development of 'Happiness Economics', in which people's self-reported happiness is regarded by many economists as an appropriate proxy for utility (Frey, 2008, p. ix) and consumption is often represented by income only (cf. Clark *et al.*, 2008, p. 100). From an economic perspective, consumption and its effect on utility is of primary interest. Hence happiness economics has focused on the relationship between happiness and income (cf., for example, Clark *et al.*, 2008; Easterlin, 1995; Frank, 2005). The positive correlation found in these studies between happiness and income can be explained by using classic microeconomic theory: an individual derives utility from consuming goods and services, which can be purchased using current income, saved income (i.e. accumulated wealth) or new debt. Thus, higher levels of income and wealth should lead to higher levels of happiness (utility) through greater consumption opportunities.

In western countries, people typically earn more money than required for their basic needs. Consequently, we face the question of how we should spend this surplus money in order to increase our happiness. In general, people have two options between which they can choose: spending or saving. While spending is likely to increase happiness in the short term, it may reduce happiness in the long term. This dilemma is illustrated in Lafontaine's fable of 'The ant and the cricket', in which the cricket enjoyed the summer singing carelessly, while the ant worked all the time. The cricket ended up unhappy in the winter, while the ant was happy enjoying the fruit of his earlier labor.

This illustration raises the question of how much saving or spending is optimal for long-term happiness. In other words, what is the best way to accumulate wealth? Should one deposit money in a bank account, buy life-insurance, put it into stocks and shares or invest in durables such as a house or car? There are pros and cons; for example, buying a house will provide consumptive reward, but at the cost of financial flexibility. We cannot see into the future, but we can orient on past experience. In this context it is

worth knowing how happy people are who have saved or spent more or less, and, in particular, how saving and spending has affected happiness of people with similar personal characteristics and living in similar situations. Bits of such information are available from hearsay and from examples in the media, but we would fare better with data based on scientific research.

Most studies have focused only on one aspect of an individual's financial situation, namely an individual's income, such that their opportunities for consumption are only partially captured (Weinzierl, 2005). Focusing exclusively on income and so ignoring measures beyond income, such as an individual's or household's wealth (financial assets, for example), may lead to misguided or false conclusions regarding the relationship between utility and an individual's consumption levels (Clark *et al.*, 2008). While there have been studies carried out on the relationship between happiness and wealth of nations (cf., for example, Hagerty and Veenhoven, 2003; Schyns, 2002), the relationship between happiness and individual or household wealth has only recently been studied and scarcely so (cf., for example, Brown *et al.*, 2005; Headey *et al.*, 2004; Headey, 2008).

The relationship between happiness and individual wealth (and its various components including assets and debt) has only recently sufficiently and systematically been researched and documented by Jantsch and Veenhoven (2019). This paper is an update of that research synthesis, adding the latest 51 findings.

In this review of research we seek answers to the following questions.

1. How is wealth associated with happiness?
2. How are the different wealth components related to happiness?
3. Do the effects of wealth on happiness differ among nations and populations?
4. What is the effect size of wealth on happiness?

The answering of these questions requires description of the relationship, not an explanation. We draw on an existing collection of research findings on the relationship between happiness and wealth available in the World Database of Happiness. In doing so, we briefly discuss in Section 2 the concepts of happiness and wealth, how they are assessed and their possible relationships with each other. In Section 3, we describe the procedure of this review including a description of the World Database of Happiness and of how we present the results, which are shown in Section 4 and discussed in Section 5. Our conclusions are drawn in the final Section 6.

2 CONCEPTS AND MEASURES

2.1 Happiness

The term 'happiness' is used with several meanings in the literature. In philosophy, it is typically used to denote 'a good life', covering both objective aspects of life and subjective enjoyment of life. In this paper, we focus on happiness as the subjective enjoyment of life and consider it in relationship with an objective condition, one's material wealth.

Definition of happiness

We focus on 'happiness' in the sense of the 'subjective enjoyment of one's life as a whole', which is also called 'life satisfaction'. This definition of happiness is delineated in detail in Veenhoven (1984). The differences with related notions of subjective well-being are analyzed in Veenhoven (2000).

Components of happiness

Our overall evaluation of life draws on two sources of information: (1) how well we feel most of the time and (2) to what extent we perceive we are getting from life what we want from it. Veenhoven (1984, p. 25-27) refers to these sub-assessments as 'components' of happiness, called respectively 'hedonic level of affect' and 'contentment'.

The affective component is also known as 'affect balance', which is the degree to which positive affective (PA) experiences outweigh negative affective (NA) experiences (Bradburn, 1969). Positive experiences typically signal that we are doing well and encourage functioning in several ways (e.g. Fredrickson, 2004). They also protect health (e.g. Veenhoven, 2008). The affective component tends to dominate in the overall evaluation of life (Kainulainen *et al.*, 2018).

Measures of happiness

Since happiness is defined as something that is on our mind, it can be measured using questioning. Various ways of questioning have been used, direct questions and indirect questions, open and closed questions, one-time retrospective questions and repeated questions on happiness in the moment. Some illustrative questions are:

- *Question on overall happiness:*
  Taking all together, how happy would you say you are these days?
- *Questions on hedonic level of affect:*
  Would you say that you are usually cheerful or dejected?
  How is your mood today? (Repeated over several days)

- *Question on contentment:*

  1) How important are each of these goals for you?

  2) How successful have you been in the pursuit of these goals?

A review of strengths and weaknesses of measures of happiness and their applicability in different contexts is available in Veenhoven 2017.

2.2 Wealth

Definition of wealth as 'stocks'

In this paper we focus on 'wealth' in the sense of material possessions; we do not consider non-material resources denoted using this term, such as 'mental wealth' or 'moral indebtedness'. Given our research questions, we limit to individual wealth and do not consider assets of groups or nations.

Briefly, wealth is the value of all the material resources an individual possesses. To be more precise, wealth can be defined as the sum of the total monetary value of an individual's assets and the total value of an individual's outstanding balance of liabilities or debts (see Figure 1). Total assets, in turn, are composed of the value of an individual's financial assets such as bank deposits, mutual funds, current accounts, savings account, stocks and shares, pensions or whole life insurances and real assets such as value of properties. i.e. household's main residence, other real estate property, self-employed businesses, vehicles and valuables, such as jewelry. All these different components have different degrees of liquidity, real assets are highly illiquid.

The total outstanding balance of an individual's liabilities consists of a mortgage (secured) debt on a main residence if they have one, or mortgages on any other properties they own and non-mortgage (unsecured) debts such as a credit line, credit card debt or other non-mortgage loans. Suter (2014) distinguishes different kinds of debts, such as by type of creditor (private creditors, official creditors, and multilateral financial institutions) or maturity composition (short-term, medium-term or long-term obligations). These differences have not yet been included in studies on the relation between debts and happiness.

Measures of wealth

Generally, there are two ways to measure wealth; using data from registrations or using self-reports as assessed in surveys. Since we conceptualise wealth 'objectively' as a total of an individual's assets and debts, we do not consider the subjective evaluations individuals hold on their wealth, such as how well off they are compared to other people or how worried they about their debts.

Registration data. Some studies use wealth data which is taken from administrative tax records and used to analyze the wealth structure of specific populations, regions or countries. However, comparisons of

wealth between different countries are difficult as the tax systems often differ considerably. While there is no administrative data on wealth, estimates of an individual's wealth can be made by utilizing the information provided on taxable income. In this case, the taxable income can be capitalized using a common rate of return on asset types. This procedure, however, does not provide any new information compared with the direct use of the income value. Advantages of administrative data are that the actual values of different wealth components are reported in a very detailed level. Furthermore, large and representative samples are available for analyses, although these data are not gathered for research purposes. Hence, a disadvantage is the lack of individual information such as information on the socio-economic status or subjective data (Browning and Leth-Petersen, 2003, p. F283).

Survey data. The survey-based way to measure wealth is the most commonly used measure for empirical analyses. Here, an individual's wealth is assessed from responses to questions, typically multiple questions on different types of assets or debt. In contrast to survey data on income, the availability of such data on wealth is scarce. While almost everyone can specify their income reasonably well, the situation is different for wealth. There are many difficulties to be overcome recording individual wealth using surveys.

One problem lies in the sampling, which may not cover poor and rich equally well. A second problem lies in responses themselves to the question on wealth, which some respondents refuse to answer because they are not able to determine their own wealth or do not wish to answer for reasons of privacy. It is known, for example, that poor or very wealthy people in particular are more likely to refuse to respond, which will lead to a 'middle class bias' (Frick, 2010). Since it is particularly important for longitudinal studies to keep the attrition rate to a minimum, information on assets is often not collected every year and when it is collected, people are asked to specify their wealth between a certain range rather than be more specific.

Typically, one person, the head of the household, is asked to give information on their individual or household wealth. While the participants in some surveys, such as the German Socio-economic Panel (GSOEP), are only asked about the main components of their assets, other surveys, such as the German Panel on Household Finances (PHF), go into greater detail with specific questions about each asset and debt component (cf., Wagner *et al.*, 2007; Kalckreuth *et al.*, 2012). Typically, net wealth is then calculated based on respondents' replies to the questions on the different wealth components. There are also surveys that use a one-shot question about an individual's or household's wealth to determine the net value of their wealth; however, the fewer questions on the different components of assets and debts asked in a survey, the greater the probability that net wealth of an individual or a household will be underestimated, leading to 'aggregation bias' (Frick *et al.*, 2012).

For a review of advantages and disadvantages of the different measures of wealth see Frick *et al.* (2012).

2.3 Possible relationships between wealth and happiness

The question remains whether wealth makes people happy, or whether happy people tend to accumulate wealth. We discuss briefly the causal direction between happiness and wealth; i.e. we want to discuss possible mechanisms regarding the possibility that high (or low) happiness levels cause more wealth holdings vs. high (or low) happiness levels are a result of wealth holdings.

Wealth $\Rightarrow$ *Happiness*

Wealth can add to long-term happiness in different ways. An obvious causal mechanism is that wealth bolsters one's social esteem, and as a result also one's happiness. Yet this will work only for visible wealth and in conditions where wealth is much valued. A more common effect seems to be that wealth provides a sense of security, probably more so among risk averse people. Typically, individuals apply strategies to cope and minimize risk. Risk, for example, can be seen as the volatility of a particular outcome such as an individual's economic performance over time. To reduce the volatility of their economic performance, individuals can (i) smooth their income by making very conservative production and/or employment choices to avoid income shocks; and they can (ii) smooth their consumption through saving or invest money or having insurances or pension contracts (Morduch, 1995).

Besides income, which is characterized as a periodic, regular received amount of money that can be used for consumption immediately, assets are used particularly to smooth consumption over a life cycle and stabilize an individual's economic situation. Assets provide security against income shocks and serve as security for debt. Finally, yet importantly, assets generate income via investment, which in their turn contributes to happiness. Given these characteristics and functions, one could expect a positive relationship between subjective well-being and assets; however, property, for example, can become a burden as it has to be administrated. This, in turn, can lead to mental distress, which may lower an individual's subjective well-being. Furthermore, wealth can also affect subjective well-being negatively, possible causal effects being the envy of other people and stress resulting from protection of one's property or attitudes indicating problems with financial control (Grnik-Durose and Boro, 2018).

Likewise, indebtedness can affect happiness in different directions and through different causal mechanisms. Tay *et al.* (2017) have developed a conceptual framework where possible mechanisms of debt on happiness are considered. Firstly, assuming that satisfaction with disposable income or other financial resources is part of an individual's subjective enjoyment of their life as a whole, debt may be negatively related to happiness, as debt affects happiness through the financial domain or other life domains. Tay *et al.* (2017) call this a bottom-up spillover' effect of debt. Secondly, total debt lowers an individual's financial resources, which, in turn, means lower consumption opportunities for the individual and therefore lower levels of happiness. The association between subjective well-being and debt is therefore considered from a 'resource' perspective (Tay *et al.*, 2017).

If the different debt components are considered separately, the relationship between happiness and debt can be expected to be both negative and positive. For example, mortgage indebtedness does not necessarily reduce an individual's happiness level, as the individual may achieve through this indebtedness a certain goal, namely owing a house (Tay *et al.*, 2017). Moreover, it is conceivable that if the value of the monthly debt service for homeowners is lower than the rent they would have to pay for a comparable home, they will have a higher disposable income and thus a higher degree of happiness. It is also conceivable that debts which increase one's income or accumulate wealth in the long run, for example obtaining business loan, is positively related to an individual's happiness. Non-mortgage debt or other unsecured debt have found to be negatively associated with happiness (Brown *et al.*, 2005). One reason for a negative effect could be that the added pleasure' of the goods paid for by, for example, credit card is less lasting or is even smaller than the pain' of being in debt.

In conclusion, the distinction between the different types of assets and debts is important, as it is well known that different types of assets or debt in a households' portfolios can have differential effects on life satisfaction (Office for National Statistics, 2015).

Wealth $\Leftarrow$ *Happiness*

Reversed causality is also likely to exist, where happiness influences the accumulation of wealth. One plausible mechanism is that happiness typically broadens' one's behavioral scope and as such fosters the building' of resources (Fredrickson, 2004), in this case material wealth. Happiness also fosters the building of social networks, and as such happy people may more often get assets transferred by parents or through inheritances. Reversed effects may also exist, such as happiness instigating careless consumption like that of the cricket in the above-mentioned Lafontaine fable.

All this illustrates that it is difficult to predict how accumulation of wealth will work out on one's happiness on the basis of *theoretical* deduction. For that reason, we follow an *inductive* approach in this paper, describing the observed relationships between happiness and wealth.

3 METHODS

3.1 Use of a finding archive: The World Database of Happiness

Until now, November 2020, happiness has been the subject of research in around 7,500 empirical studies, and this year around 800 further studies are expected on this subject (Veenhoven *et al.*, 2018, p. 3). This makes it very difficult, almost impossible, to overview all this research. For this reason, the finding archive World Database of Happiness' (WDoH) was set up. This database consists of electronic finding pages' on which quantitative research results are described in a uniform format and terminology. These finding pages are sorted by topic and methodology using fine grained classifications (Veenhoven, 2020). Finding pages

are gathered in collections'. Findings on how happy people are in particular populations are gathered in the collection of distributional findings; findings on things that go together with more or less happiness are gathered in the collection of correlational findings. The structure of the WDoH is shown in Figure 2. A recent description of this novel technique for the accumulation of research findings can be found with Veenhoven (2020c). For this review, we used this source for the following purposes.

Gathering studies

Over the years, many findings have been entered in the WDoH, among which are findings on happiness and wealth, sometimes as side results of studies that aimed at other things. We completed the collection up to November 2020 on the basis of an additional literature search. This review is based on scientific publications that report findings on the relationships between happiness and wealth as defined in Subsection 2.1. We also considered studies that report findings on particular changes in wealth such lottery winnings.

Selection of findings

The WDoH limits to the studies that assess happiness as defined in Subsection 2.1 and use a valid measure of that concept. This selection process is described in detail in Chapter 3 of the introductory text to the Collection of Happiness Measures (Veenhoven, 2020d). Selection on a specific *concept of happiness* implies that we have not included studies on the relation between happiness and other kinds of subjective well-being, such as the otherwise interesting papers of Dean *et al.* (2007) and Dew 2008 on marital satisfaction' and the Dwyer *et al.* (2011) study about the effect of wealth on self-esteem'. Selection on *measurement of happiness* implied that we did not include a longitudinal study on financial windfalls in which happiness was measured using a health questionnaire (Gardner and Oswald, 2001). Rigorous selection on a clear concept, in our case happiness well defined, is required for fruitful research synthesis.

Together, we found 123 studies that are linked in the tables of this review and whose links lead to the corresponding finding pages in the WDoH. As far as we know, we have gathered all the qualifying studies available in the Word Database of Happiness up to November 2020.

Standardized description of the findings

In the WDoH, findings observed in selected studies are described individually on electronic finding pages, where a standard format and a well-defined technical terminology is used. Each finding page contains bibliographic information and a link to the original study. Information is provided on the data used, i.e. which population was considered, how many observations were taken into account and information on the respective sample design. Furthermore, it is reported how both happiness and the variable of interest, in our case wealth, were operationalized in the respective study. The methods used and eventual control variables are specified and the results presented in the form of statistical indicators. This standardization is required to enable accurate comparisons of research findings and prevent confusion due to different presentations in the original research reports. Complete and accessible storage of all details using standard notation

is required for controllable reviews. This way of uniform notation is described in detail in chapter 3 of the Introductory Text to the Collection of Correlational Findings of the WDoH (Veenhoven, 2020b). An example of a finding page on happiness and wealth is given in Figure 3.

Storing the findings

The finding pages are entered in the electronic archive and made available on the Internet, where they can be easily found in searches, such as on subject, population, research technique and bibliographics. This makes the results more assessable than in the original research reports and lays the foundation for continuous accumulation of knowledge, as qualified new findings can be added at will according to the standard format. This paper is already an update of the research synthesis by Jantsch and Veenhoven (2019), adding 79 findings obtained from 51 new studies. The findings on happiness and wealth are stored in the subject section Happiness and Possessions' (Veenhoven, 2020b) of the Collection of Correlational Findings.

Presenting the findings

This technique of using a findings archive gives us a new way of displaying research results in a review paper. Quantitative research findings can be simply summarized using a sign or a number, with a link which will lead to an online findings page in the WDoH with full detail of the particular finding. This enables us to present a large number of findings in a few tabular overviews. This novel way of reporting is explained in more detail below in Subsection 3.2.

3.2 Presenting of findings in this review

We applied a new presentation technique, which takes advantage of two technical innovations: 1) the availability of the above described online *finding archive*, which holds standardized descriptions of quantitative research findings, presented on separate *finding pages*, each with a unique internet address. 2) The change in academic publishing from text printed on paper to text on screens, into which *links* to online information can be inserted. We call this 'link-facilitated research synthesis'.

Notation of the findings

We present the findings differentiated according to net wealth and the various wealth components in tables. The observed statistical relationships are indicated using signs, which link to the respective finding pages in the WDoH. Using control+click the reader will get to the page containing the full detail about a particular research finding.

We present the observed statistical relationships between happiness and wealth with the help of + and – signs. Whereas + sign indicates a positive correlation, a – sign denotes a negative correlation between happiness and wealth. These signs are to be considered independent of the effect size. If a finding in the

originally study is statistically significant, we will mark it using a bold sign: **+** or **−**. If different results are reported for different specifications, we will use a string of symbols: a finding, for example, showing +/+/– indicates that subsequent controls have changed an initial positive correlation to a negative correlation. Clicking these signs links to the respective finding page. In Table 4, we consider the shape or the observed relationship and distinguish between linear relationship (indicated /) and curvilinear pattern (indicated ⌈).

We also consider the observed *effect sizes*. Here we met the problem that different statistics which show the degree of association have been used in the different studies, many of which are not comparable; e.g. Odds Ratio's and Ordered Probit Coefficients. For that reason, we limited our overview of observed effect sizes to correlation coefficients standardized on a range from -1 to +1. For bivariate correlations we used the Pearson Correlation coefficient (r) and for partial correlations as a result of multiple analysis the standardized regression coefficient obtained from OLS regressions ($Beta$). We computed the average effect size based on the Pearson correlation coefficient r using Fisher's z transformation $z = 0.5 \cdot \ln(\frac{1+r}{1-r})$ and the standard error SE considering the number of observations n: $SE_z = \sqrt{\frac{1}{n-3}}$ (Borenstein *et al.* 2009: 42).

The standardized regression coefficients $Beta$ result from a linear regression in which the independent and dependent variables have been standardized, i.e. the expected value equals zero and the variance equals one. If no standardized regression coefficients were reported in the original studies, we calculated them on the basis of the given regression coefficients: $Beta_j = B_j \cdot \frac{s_{x_j}}{s_y}$, with B_j being the regression coefficient of the explanatory variable x_j, s_{x_j} the standard deviation of x_j and s_y the standard deviation of the explained variable y. These effect sizes are presented in stem-leaf diagrams.

Differentiation by research design and statistical analysis applied We organized the findings in separate tables. We started with a presentation of all 198 findings, distinguishing between findings on net wealth, total assets and debt, and their components, respectively (Table 1). The 9 findings that indicate the shape of the relationship between happiness and wealth are shown in Table 4. For a more refined picture, we assigned all findings to their respective categories, for example, savings or stocks within financial assets (see Table 5), and mortgage or business debt within secured debt (see Table 6). Furthermore, we split all findings on the relationship between assets and debt by nations (see Table 7 and Table 8, respectively).

We distinguished between studies that make use of (1) cross-sectional data, in which the same-time correlation between levels of wealth and happiness is assessed, (2) longitudinal data, in which the relationship between change in assets or debt and change in happiness is assessed, and (3) experimental data, in which the effect of induced change in assets or debt on change in happiness is assessed. Longitudinal and experimental data provide more information about causality, while experimental data provides the most information about the direction of causality. The latter studies are the most informative for answering

research question 2 regarding how different wealth components relate to happiness, yet they are the least numerous. All we found is one study on the effect of lottery winning on happiness, which can be seen as a natural experiment'. Several studies report findings using more than one statistical analysis, which explains the same finding pages appearing in different columns of the tables and thus the difference in numbers between considered studies (123) and findings (198) in this review.

To the best of our knowledge, however, none of these studies claim to be causal, which in turn increases the risk of spurious correlation; i.e. the relationship between wealth and happiness is explained by a third factor not considered, for example marriage. One could imagine that marriage influences both the accumulation of wealth and happiness without a connection between the two. This problem is most pressing in studies that use cross-sectional data but can also exist in studies that use longitudinal or experimental data. In order to face the problem and to get a more refined picture, multiple analysis is usually carried out. This approach involves the risk of over-control, in which true variance is removed, for example when control for marital status wipes out the correlation between house-ownership and happiness, while having a house actually adds to happiness through better marriage chances. In the tables, we distinguished between (a) bivariate correlations and (b) partial correlations. For the partial correlations, we further distinguish between three methods: Ordinary Least Squares (OLS), Ordered Probit/ Ordered Logit (OPL), and Instrumental Variable analysis (IV).

Advantages and disadvantages of this link-facilitated review technique

This kind of literature review, a link-based research synthesis, has several advantages over traditional reviews. While traditional literature review articles are restricted to the printed page, a link-based research synthesis like this one can take advantage of the Internet (Veenhoven *et al.*, 2018). Since the links provided in this text lead the reader directly to research results that follow standardized descriptions, verification with the available data is faster and easier. In addition, empirical studies in traditional literature review articles can often only be selectively explained and cited due to lack of space. The referencing in a link-based review, in contrast, is almost complete. In other words, our new method allows all studies to be considered and thus avoids the danger of cherry picking'. It also provides easy access to much more detailed information in the online finding pages.

A disadvantage is that much detail is not directly visible in the signs by which the quantitative relationships are summarized, in particular the effect size and control variables used. Further disadvantages are that links work only in electronic texts. This technique requires the creation of a specialized findings archive infrastructure, the establishment of which will only be worthwhile if a lot of research has been covered and a long-term perspective needs to be taken on the type of research being archived.

4 RESULTS

4.1 Does wealth add to happiness?

We divided this question into three parts: 1) Are wealthy people happier and are indebted people unhappier? 2) If so, is this a spurious correlation? 3) If not, does wealth affect happiness, or is the effect a result of reverse causality; ie. happy people gather more wealth? Using the findings presented in Table 1, these questions can be answered as follows.

Wealthy people are happier

In Table 1, all 198 findings on the relationship between happiness and wealth are shown. Focusing on net wealth, the second column shows the simple bivariate correlation between happiness and net wealth, which is in most cases positive. Clearly, the people who are better off tend to be happier than the people who are worse off. A similar picture emerges when looking at the partial correlations: when controlling for other important determinants of happiness the coefficient for net wealth remains positive and statistically significant in most cases. Only two findings for a sample containing the unhappy' suggest a negative relationship between net wealth and happiness. Another finding by Knight *et al.* (2009) suggests a negative relationship when an instrumental variable approach was used with income as the instrumented variable.

When we have a look at financial assets, a positive relationship between happiness and financial assets is revealed, with two exceptions. Firstly, financial assets are negatively related to happiness for rural-urban migrants in China, although the regression coefficient is not statistically significant different from zero. Secondly, the regression coefficient for people who own stocks or bonds, which is only one component of financial assets, is negative for West Germans by using an instrumental variable analysis. The studies using longitudinal data, however, reveal a clear positive and statistically significant relationship (see Table 5). The bivariate correlation between happiness and real assets is also positive apart from two exceptions and mostly statistically significant. The statistically insignificant, negative OLS coefficients for real assets in some cases mainly concern home ownership by elderly people or other real assets such as cars.

Indebted people are less happy

The bivariate correlations between total debt and happiness shown in Table 1 suggest that the sum of an individual's or a household's total debt is negatively related to happiness. The picture changes if we distinguish between secured and unsecured debt. The relationship between happiness and secured debt is mostly positive. Findings based on longitudinal data, and therefore changes in debt over time, confirm this positive relationship between happiness and secured debt. The one non-significant positive correlation results from control for perceptions of relative income, which may have removed part of the worries that go with indebtedness. Mixed results appear for the relationship between happiness and unsecured debt.

While the partial correlation of cross-sectional data is positive, two findings based on longitudinal data and therefore on changes in unsecured debt show a clear negative relationship between total debt and subjective well-being.

Not a spurious correlation

The greater happiness of wealthy people could be due to other factors than their wealth, such as a better health or education. Positive correlations can be misleading if homeowners, for example, are more often married and their greater happiness is derived from their marital status. The possibility of spurious relationships can be excluded by conducting multiple regression analyses. This did not change the direction of the correlations and only slightly reduced the number of significant correlations.

At first sight, there are exceptions in the few statistically insignificant, negative OLS coefficients for real assets in some cases (Table 1). These mainly concern home-ownership by elderly people or other real assets such as cars. A possible explanation for the observed negative correlation between happiness and being a homeowner in the study by Mollenkopf and Kaspar (2005) could be the control of satisfaction with several domains of life such as health, housing, living area and leisure time in addition to individual socio-economic characteristics.

Causal effect likely

A non-spurious could still result from reversed causality, happiness facilitating the accumulation of wealth (cf. Subsection 2.3). Several techniques have been used to identify a causal effect of wealth on happiness. Instrumental variable analysis (IV) was applied on cross-sectional data in three studies and shows mixed results: two insignificant positive correlations and two negative correlations, of which one is statistically significant. This latter coefficient results from an analysis where the authors Knight *et al.* (2009) additionally consider the importance of family, friends and religion.

The 18 findings based on longitudinal data that consider changes in happiness following changes in wealth show that growing wealth tends to go with rising happiness; however, happiness can have been raised for other reasons and raise wealth in its trail.

For a definite proof of the causal effect of wealth on happiness we need experimental data. Since laboratory experiments are not really possible on this topic, we must make do with natural experiments and assess whether substantial financial windfalls, such as inheritances and lottery wins, raise long-term happiness. This was the subject of the above-mentioned study by Gardner and Oswald (2001), which regrettably did not use an acceptable measure of happiness. To our knowledge the effect of inheritances on happiness has yet to be assessed. The bivariate findings on lottery winners are not conclusive, since some studies find slightly greater happiness among lottery players, irrespective of winning (Veenhoven, 2018).

4.2 How much does wealth add to happiness?

As noted in Subsection 3.2, we selected findings expressed in a comparable effect size from -1 to +1 and present these in stem-leaf diagrams. The 56 bivariate correlations r for total wealth, financial and real assets obtained in cross-sectional studies vary between -0.03 and +0.36 with an average of +0.11 and a standard error of 0.15 (see Table 2). The 21 partial correlations are about half this size varying between -0.23 and +.018 with an average of -0.012. The effect sizes of the findings obtained from studies that use longitudinal data are in a similar range. The average effect size of the two bivariate correlations is +0.23 and the seven Beta's range between +0.06 and +0.25 with an average of +0.15 and a standard deviation of 0.084.

The observed relationships between total debt, secured and unsecured debt and happiness are shown in Table 3. The three bivariate correlations between total debt and unsecured debt and happiness range from -0.25 to -0.13 ($mean = -0.21$; $SE = 0.14$) and indicate a clear negative relationship. When we look at the partial correlation of cross-sectional data, five out of seventeen findings confirm this negative correlation, as the standardized regression coefficients of total debt and unsecured debt remain negative. Interestingly, twelve partial correlations show a positive relationship between happiness and debt, even though four are not statistically significant. These positive coefficients rely on secured debt or mortgage debt ($mean = -0.001$; $SD = 0.02$). Findings based on longitudinal data, and therefore change in debt, do not confirm this positive relationship between happiness and secured debt ($mean = -0.04$; $SD = 0.03$).

The standardized correlation and regression coefficients do not tell us much about the importance of wealth for happiness. At the moment they only tell us how many standard deviations happiness would change if a certain measure of wealth changed by about one standard deviation. Coupled with the fact that we observe different measures for happiness (sometimes 7-point scale, sometimes a 11-point scale) and for wealth (sometimes the absolute value and sometimes the logarithm of wealth), this makes it difficult to say whether these effects are meaningful or not. To answer this question, we have to compare these average effect sizes with average effect sizes of other variables, such as another monetary variable like income. Standardized coefficients, however, do tell us whether assets or debt are more important for happiness. The average effect size of the regression coefficients for total assets of the studies that used longitudinal data is larger (0.16) than the respective absolute value of the average effect size for debt (-0.06) on happiness. Assuming a causal relationship between wealth and subjective well-being, these results suggest that assets have a greater positive impact on happiness compared with debt having a negative impact. The explained variance in happiness is considered to be smaller than that of non-material resources such as health, which explains about 5% of the variance in happiness (e.g. VanBeuningen and Moons, 2013) and marriage, which explains about 4% (e.g. Schulz *et al.*, 1985).

4.3 Is more always better? What amount of wealth is required for a satisfying life in the long term?

Only eight studies have inspected the shape of the relationship between wealth and happiness and found a pattern of diminishing marginal utility, with a stronger correlation for happiness and wealth in the lower half of the wealth distribution. See Table 4. None of these studies found no effect at all among the wealthiest, more wealth still gives more happiness among the rich. So, there is no satiation point for wealth.

4.4 What kind of assets result in the most happiness? What kind of debts reduce happiness most?

Once we know that wealth contributes to happiness, though not very much, the next question is whether all types of assets contribute to and all types of debts lower happiness in a similar way. One can choose to invest in financial assets and real assets and in both cases between variants of these. In the reverse case of going into debt there is a choice between secured and unsecured debt. How are such choices related to happiness?

Financial assets or real assets?

Table 1 shows that, apart from a few exceptions, both financial and real assets are positively associated with happiness. By comparing the effect sizes of (the few) findings on financial and real assets, it seems that financial assets matter more for happiness than real assets do (see Table 2). The number of findings on financial assets, however, is too little in order to allow a meaningful comparison.

Kinds of financial assets and debts

When one opts for financial assets, the next step is to choose a particular kind of holding. In the reverse case of going into debt there are also options to choose. How did such choices affect an individual's happiness?

Happier with safe savings. One can save in different ways: open a savings account at a bank, buy bonds or buy insurances. All these types of financial assets tend to go with greater happiness, whereas mixed effects are observed for the riskier kinds of savings, such as placing assets in stocks. Here, we excluded operating assets as they are both types of assets financial and real.

Happier with secured debts, but unhappier with unsecured debts. The relationship between happiness and secured debt is positive with the exception of four findings (Table 1). In the case of the bivariate correlation, this is not surprising as it neglects other important determinants of happiness. Hence, it is not possible to distinguish between the negative effects of being indebted and the positive effect, for example, of being a houseowner, and having mortgage. In this case, the joy of owning and living in a house is higher

than the pain of being indebted. Even if controlled for other important determinants of happiness, the partial correlation is also positive in most cases. A possible reason for this could be that, for example, the monthly debt service for houseowners is lower than the rent they would have to pay if they wanted to rent a comparable house. Moreover, since the debts are secured, an individual can sell the house and get out of that debt if they have an unexpected job loss or an inability to service the monthly debt payment.

Three findings on happiness and unsecured debt shown in Table 1 suggest a clear negative relationship. Interestingly, microfinance loans as a specific type of unsecured debt are positively correlated to happiness, while other types of unsecured debt such as student loans are negatively correlated (see Table 6).

Kinds of real assets

When investing in real assets, there are also many options such as buying furniture, pieces of art, and jewelry. Findings on the relationship between having such assets and happiness are available only for two such options; (i) owning a house and (ii) owning a car. These findings reported in Table 5 reveals a positive relationship between happiness and real assets apart from a few exceptions indicating that owning a car is not always associated with greater happiness.

Homeowners happier. Empirical results regarding the relationship between happiness and home ownership are shown in Table 5. What do these findings tell us regarding our research question 2 regarding how different wealth components relate to happiness?

Among the cross-sectional findings summarized in Table 5 all the bivariate associations are positive. This pattern appears in comparisons of owners versus non-owners and of owners and renters, and suggest that home-ownership adds to happiness. Next to full house ownership, there are several kinds of partial ownership, such as time-limited ownership (redemption), joint ownership with others, usufruct and the right to use a house free of charge. The correlation with happiness of these ownership modalities has been addressed in two cross-sectional studies, the results of which are also summarized in Table 5 too. These findings suggest again that home-ownership of what-ever type tends to go with greater happiness.

Table 5 also shows the partial correlations where most of these are positive, which in turn suggests, too, that home ownership fosters happiness. In five cases, the partial correlation is negative. A closer look at these divergent findings reveals that in two studies satisfaction with several life domains has been considered in addition to the usual controls[4], which leads to endogeneity problems. In two cases different specifications of the model changed the picture: Rossi and Weber (1996) controlled for the socio-economic characteristics and in a study, among women, by Bucchcaniari (2011), family situation and average income in the neighborhood were additionally controlled for. These controls could be too severe and wash out the true effects of home-ownership on happiness. In particular, the control for income, as part of the effect of income on happiness is in what income allows one to buy, and among these expenses is a house. Eight

[4] Shu and Zhu (2009) and Mollenkopf *et al.* (2004)

longitudinal findings are available on this topic and all findings suggest that a change to home-ownership is typically accompanied by a rise in happiness. Yet these studies do not show, however, what came first: the buying of a house or the rise in happiness.

Cars do not necessarily contribute to happiness. The bivariate correlation between happiness and ownership of a car is in most cases positive with two exceptions. Females in the UK, for example, tend to be unhappier when they have access to a car whenever they want, even though this correlation is not statistically significant. Another study investigated the relationship between happiness and price of the car one owns. The bivariate correlation and the partial correlation between happiness and a car in the lowest price category is found negative for the US. Other studies have also revealed a negative partial relationship between happiness and owning a car (see Table 5, column OLS).

Business. We find mixed results regarding the relationship between happiness and real assets used for business purposes. In this case, these assets are related to agriculture such as land ownership and livestock. Bivariate relationships indicate a positive relationship between happiness and the size of farm someone owns. However, the fact that one owns land is negatively related to happiness. Partial correlations indicate a positive relationship between happiness and both size of land and the amount of livestock someone holds. The one negative relationship that has been found holds for a subpopulation only; happiness is predicted to be lower if people migrate from Bangladesh to the UK.

4.5 Do the effects of wealth on happiness differ across places and people?

Now we will have a look at the relationship between happiness and net wealth, separately for assets and debt among different nations and populations.

Similar across nations

Among all nations, net wealth is positively correlated with happiness apart from a negative partial correlation for China and the US, respectively (see Table 1). Moreover, in most nations a positive relationship has been observed between assets and happiness (see Table 7). One finding suggests a negative relationship in Australia once satisfaction with wealth is controlled for. The same is true for a study among the general public in China, Germany and the UK. The coefficient for being a homeowner becomes negative, again, once satisfaction for several life domains is controlled for. One study considers rural-urban migrants in China, where financial assets in most specifications are negatively related to subjective well-being, however, this finding is not explained by the authors. Interestingly, the number of cars, or the value of the cars a household owns, is in most cases negatively related to subjective well-being, irrespective of the country where this issue has been explored. If you look at Table 8 debt is mostly negatively related to subjective well-being apart from Argentina (microfinance loan) and Italy (mortgage). Interestingly, the relationship between subjective well-being and debt is often positive in China.

Similar across populations

Among all populations, net wealth is also positively correlated with happiness apart from a negative relationship for individuals living in rural China and elderly living in the US (see Table 1 findings for net wealth). The (few) available splits made by populations are presented in Table 9. Of the 18 findings on the relationship between happiness and assets, five are negative. Among those, negative relationships have been found for females, elderly, migrants as well as rural population. We find mixed results for the relationship between subjective well-being and debt. Four findings indicate a positive relationship among urban populations. Three findings suggest a negative relationship among younger people, rural as well as urban populations too, whereas in three findings a different specification of the model changed the picture. As the findings, however, do not show a consistent difference in the effects of assets on subjective well-being between these different populations, no conclusion can be drawn.

4.6 Do the effects of wealth differ across components of happiness? Does it make us feel better or just more contented?

We distinguish the different measures of happiness described in Subsection 2.1 in Table 10. When we look at the bivariate correlations in the first column it seems that overall happiness is more affected by wealth than affective happiness or a mixed measure of happiness, which fits the finding by Kainulainen *et al.* (2018) that finances relate more to the cognitive component of happiness than to its affective component. When we look at the partial correlation, we did not find big differences between the effects of wealth on overall or affective happiness, but the data we have is insufficient to allow us to draw definite conclusions.

5 DISCUSSION

5.1 What we know now

The aim of this review was to see how wealth affects happiness, to provide people with a basis for making informed choices with respect to surplus income. Are we any wiser now? The available findings show that wealthy people are typically happier than non-wealthy people and that at least part of this difference is due to a causal effect of wealth on happiness. Some of the findings support the hypothesis of diminishing marginal utility of wealth. The findings also show that being in debt typically reduces happiness, having unsecured debts in particular. Debt made for investment in a business (micro-credit) or a house (mortgage) work out positively on happiness.

5.2 What we do not know yet

Though we know that wealth adds to happiness, we do not know yet whether saving adds more to happiness than spending. The cricket may still be happier than the ant. We also do not know what the best way to build wealth is, to invest in financial assets or to buy real assets. When we opt for investing in real assets, we know that investing in a house will probably add more to our happiness than buying a car, but we do not know how other investment will work out on our happiness, such as buying art or jewelry.

Our knowledge of what works best for whom is quite limited as yet, although the available data do not show much difference in bivariate relations across nations and social categories, there may be more differences when it comes to causal effect and when more contextual variables are considered. If one wants to know how a financial choice has worked out in the past on the happiness of similar people, these people should not only be similar with respect to nation of residence and their socio-demographics such as age and gender, but also comparable with respect to personality and values. So far, the data can only inform us about single similarities, such as age or gender, while meaningful comparison requires that data is available on the happiness of people with whom we share multiple similarities.

5.3 Lines for further research

To get a better view on causality we need follow-up studies and among these should be studies that assess the effects of externally induced changes in wealth, such as inheritances or random financial mishap. To get a view on the long-term consequences of financial choices, these longitudinal studies should cover many years, preferably life-times. To enable comparison between the effects of saving and spending on happiness, these studies should cover both of these aspects of wealth. In order to allow a view on how financial choices have worked out on the happiness of similar people, future studies should be sufficiently large to allow splits by different types of people.

Much of these requirements can be met adding questions on wealth and consumption to running panel studies such as the Australian HILDA, the British Understanding Society Survey and the German Socio-Economic Panel (GSOEP), all of which already include some measures of wealth, one or the other. Even better would be the start of a more focused large-scale panel study on the long-term effects of private financial choices. The cost will be a fraction of what the financial industry spends today on advertising. As things are, some of the required information will become available within the growing stream of empirical happiness research, particularly in the new field of happiness economics. Periodical synthesis of this data will be helpful, in particular when building on the foundations laid down in this chapter.

5.4 Sponsors of this research

This research is of interest to citizens who have surplus money and seek solid information about ways to use that money, with an eye on probable effects on their future happiness. As individuals, these citizens cannot do this type of research, so their information needs must be met by organizations. Which organizations might support this research? We see four 'parties' that could be involved. First, the scientific sector, which produced most of the above presented research findings. This party has an interest in pursuing this research topic, but is typically short of money. Second, the financial advice sector, which includes consumer unions and associations of professional financial advisors. These parties are in a good position to diffuse gathered information, but are less able to pay for the gathering of it. Third, providers of financial services to consumers, such as banks and life-insurance companies. These parties have the required funds, but are not always interested in revealing the real effects of products on the happiness of their customers. Fourth, the political sector, where interest in happiness is rising and helping citizens to make informed choices is an acceptable way to raise levels of happiness. Politicians can allocate funds to do the required research and can join forces with the other institutional stakeholders.

6 CONCLUSION

The available research findings on the relationship between wealth and happiness provide some clues for making informed choices on how to use one's surplus money. Wealth adds to happiness, in particular among the elderly. The effect is small however, and subject to declining marginal utility. Safe investments in savings or in a house of one's own tend to yield the most happiness. The available data do not inform us about the best ratio of saving and spending and only allow us a first glance at what financial choices might work out best for what kind of people.

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APPENDIX A: TERMS FOR RESEARCH TECHNIQUES USED IN THE HEADER OF THE TABLES

Research design

- Over-time correlation: cross-sectional data used; analysis of data from a population at a specific point in time
- Over-time correlation: longitudinal data used; repeated observations of the same variables over certain period of time

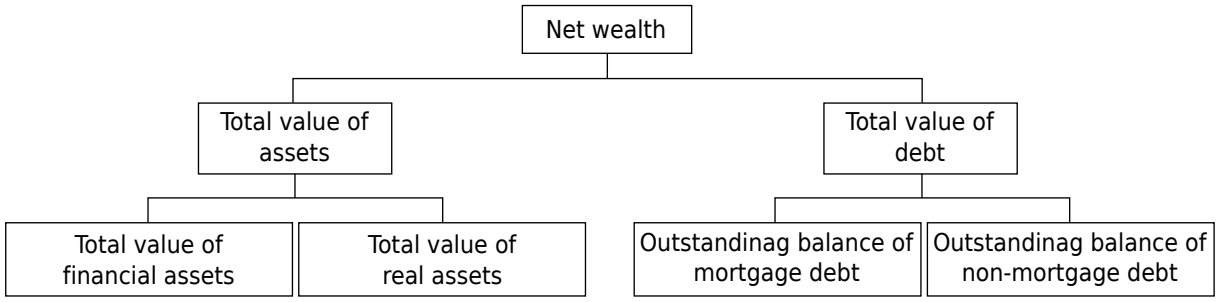
Statistical analysis

- Bivariate: correlation between two variables (wealth and happiness)
- Partial: correlation as a result of a multi-variate analysis
- OLS: Ordinary Least Square regression
- OPL: Ordered Probit or Ordered Logit regression
- IV: Instrumental Variable Analysis

APPENDIX B: MEANING OF SIGNS USED IN TABLES

+	positive association, statistically significant
+	positive association, not statistically significant
0	direction of association not reported
−	negative association, statistically significant
–	negative association, not statistically significant
+/−	positive and negative correlations obtained with different sets of control variables
/	linear positive relationship
⌈	curvilinear shape, pattern of diminishing utility
C > A	association of wealth with cognitive component of happiness stronger than with affective component
O > A	association of wealth with overall happiness stronger than with affective component of happiness
O > M	association of wealth with overall happiness stronger than with mixed measure of happiness

Figure 1: Wealth and its components



Source: Jantsch and Veenhoven (2019).

Figure 2: Start page of the World Database of Happiness: structure of the findings archive

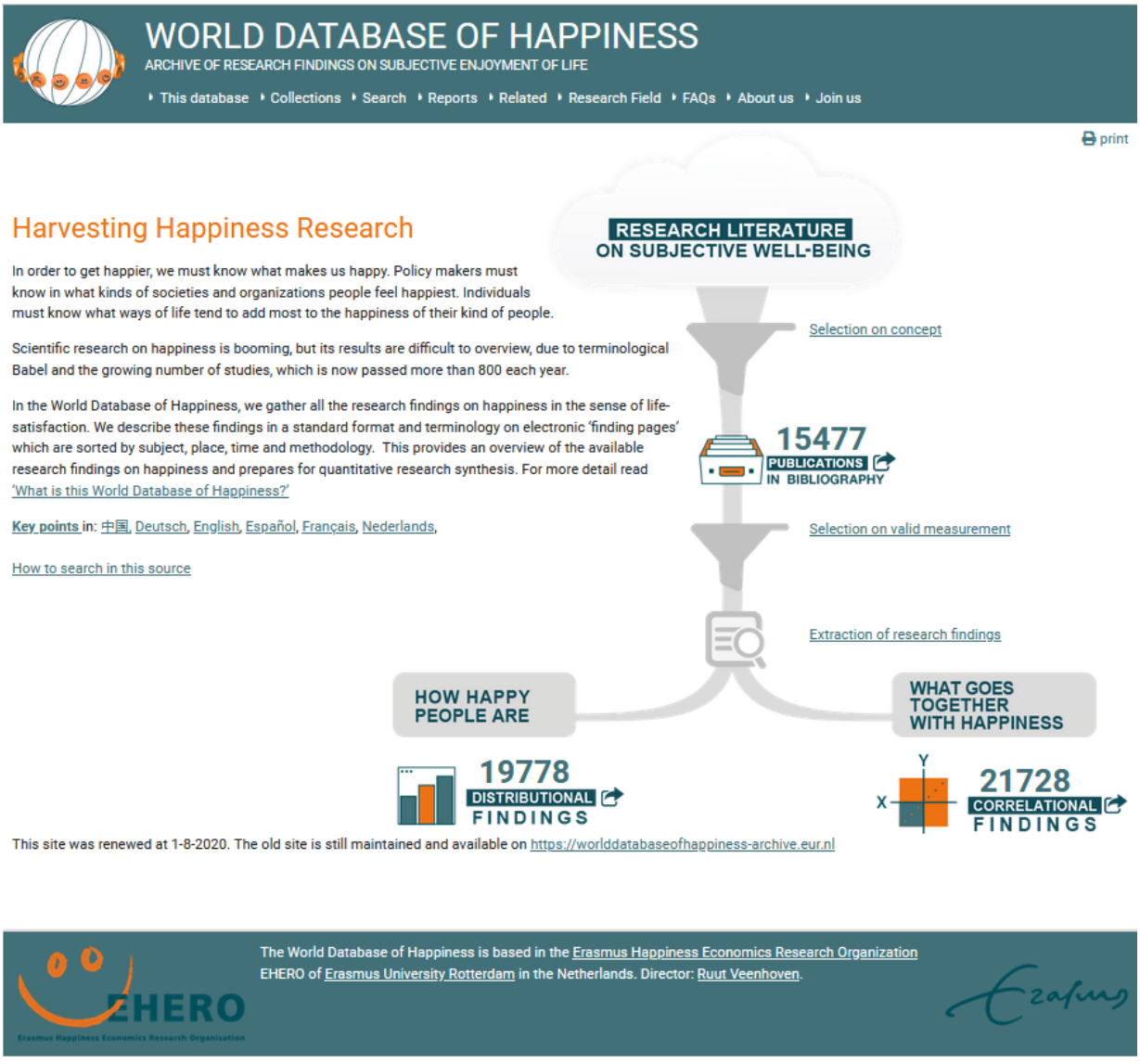
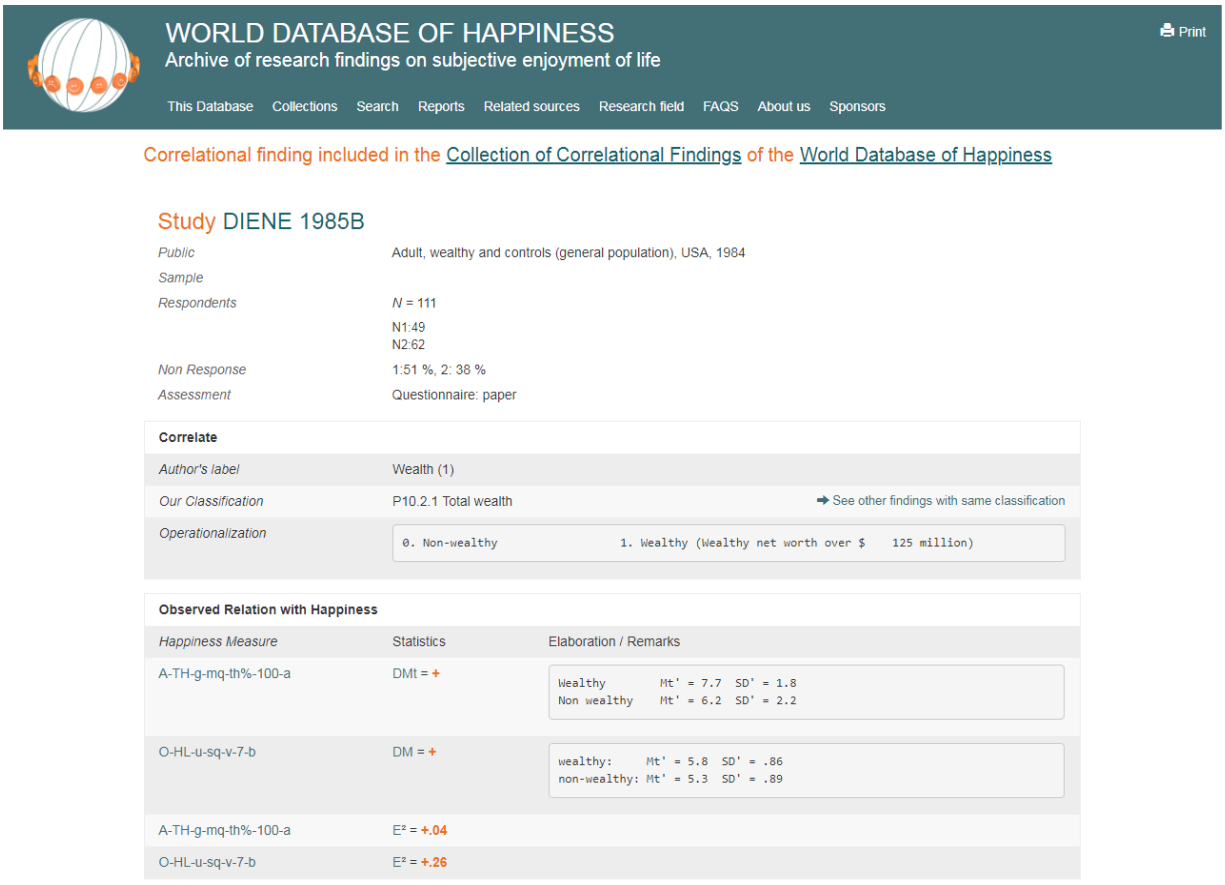


Figure 3: Example of a finding page in the World Database of Happiness



WORLD DATABASE OF HAPPINESS
Archive of research findings on subjective enjoyment of life

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Correlational finding included in the Collection of Correlational Findings of the World Database of Happiness

Study DIENE 1985B

Public	Adult, wealthy and controls (general population), USA, 1984
Sample	
Respondents	*N* = 111 N1:49 N2:62
Non Response	1:51 %, 2: 38 %
Assessment	Questionnaire: paper

Correlate

Author's label	Wealth (1)
Our Classification	P10.2.1 Total wealth → See other findings with same classification
Operationalization	0. Non-wealthy 1. Wealthy (Wealthy net worth over $ 125 million)

Observed Relation with Happiness

Happiness Measure	Statistics	Elaboration / Remarks
A-TH-g-mq-th%-100-a	DMt = +	Wealthy Mt' = 7.7 SD' = 1.8 Non wealthy Mt' = 6.2 SD' = 2.2
O-HL-u-sq-v-7-b	DM = +	wealthy: Mt' = 5.8 SD' = .86 non-wealthy: Mt' = 5.3 SD' = .89
A-TH-g-mq-th%-100-a	E^2 = +.04	
O-HL-u-sq-v-7-b	E^2 = +.26	

Table 1: 198 Research findings on subjective well-being and wealth: all findings

	Same-time correlation (cross-sectional)				Over-time correlation (longitudinal)			
	bivariate	partial			bivariate	partial		
		OLS	OPL	IV		OLS	OPL	IV
Net wealth	+ + + + + +	+ + + + + + + +/−	+/− +	−		+ +	+ + −	
Total assets	+ + + +	+ + + + − + − + − + − + − + + +		+		+		
Financial assets	+ + + + + + + +/−	+ + + + + −	+ + +	+ +/−	+ +	+ +		
Real assets	+ + + + + + + + + + + + + + + + + + +/+ +/+ +/− +/− + + + + + + + + +	+ + + + + + + + + + + +/+ +/+ + + + + + + +/− +/− +/− +/− +/− +/− −/− − − − + − − + + + + +	+ + + +/+ +/+ + + +/− + − + +			+ + + + + + + + +	+	
Total debt	− − − − −	− − +/− + + − − + +		− +/−		−	−	
Secured debt		− + + + + + + + + +	− +			− −	+	
Unsecured debt	−	+	+			−	−	

Methods mentioned in the header of this table are explained in Appendix A. Signs used in the cells are explained in Appendix B.

Table 2: Stem-and-leaf diagram: observed relationships between net wealth, total (financial and real) assets and subjective well-being

	Same-time correlation (cross-sectional)		Over-time correlation (longitudinal)	
	bivariate *r*	partial *beta*	bivariate *r*	partial *beta*
+0.3	**3 6**			
+0.2	**4 3 8**		6	**3 3 5**
+0.1	**3 4 4 9** *0* **1 7 6 0 0 1 2 2 2 2 2 4 4 5 5** 5 7 **8**	**2** 1 *8*	9	**2**
+0.0	*6* **7 7 7** 0 2 2 4 4 **5 5 5 6** 6 7 **7 7 7 7 7 7 7 8 8** 9 **9**	**0 5 6 8 8 9** 5 3 **7**		**6 7** 8
-0.0	3 *3*	1 *3 7*		
-0.1		*9* **4 7 3 7**		
-0.2		*3*		

Numbers link to online detail about this finding. Use control+click.
Beta's control individual characteristics and perceived health.
Colours of the numbers indicate: total wealth, total assets, financial assets, real assets
bold figures: statistically significant; *italics* figures: special public other than the general public (male/female or rural/urban); figures link to online detail about this finding.

Table 3: Stem-and-leaf diagram: observed relationships between total debt, secured and unsecured debt and subjective well-being

	Same-time correlation (cross-sectional)		Over-time correlation (longitudinal)	
	bivariate *r*	partial *beta*	bivariate *r*	partial *beta*
+0.3				
+0.2				
+0.1				
+0.0		*0 0 0 0 0 0* **1** *1 1 1* 2 5		
-0.0		*0 1 1* 2 **5**		**5** 0 **6**
-0.1	3			
-0.2	4 5			

Numbers link to online detail about this finding. Use control+click.
Beta's control individual characteristics and perceived health.
Colours of the numbers indicate: total debt, secured debt, unsecured debt
bold figures: statistically significant; *italics* figures: special public other than the general public (male/female or rural/urban)

Table 4: 9 Research findings on happiness and wealth: Shape of the relationship

	Same-time correlation (cross-sectional)				Over-time correlation (longitudinal)			
	bivariate	partial			bivariate	partial		
		OLS	OPL	IV		OLS	OPL	IV
Net wealth	⌈ ⌈ ⌈ ⌈ ⌈							
Total assets								
Financial assets	⌈							
Real assets	⌈							
Total debt	⌈							
Secured debt								
Unsecured debt								

Methods mentioned in the header of this table are explained in Appendix A. Signs used in the cells are explained in Appendix B.

Table 5: 98 Research findings on subjective well-being and asset components

	Same-time correlation (cross-sectional)				Over-time correlation (longitudinal)			
	bivariate	partial			bivariate	partial		
		OLS	OPL	IV		OLS	OPL	IV
Financial assets								
Savings	+	+ +	+ + +	+/−		+ +		
Stocks, bonds		+		+/−				
Pension, life insurance		+		+/−				
Other financial assets	+ + + +	+ +				+		
Real assets								
Housing	+ + + + + + + + + + + +/+ +/+ + + +	+ + + + + + + + + +/+ +/+ +/+ + + + + + +/− +/− +/− − − + + +	+ + +/+ +/+ +			+ + + + + + + +		
Cars	+ + + + + +/+ +/+	+ + +/− +/− +/− −	+ +/−			+		
Business	+ − −	+	+ - +					
Other real assets	+		+					

Methods mentioned in the header of this table are explained in Appendix A. Signs used in the cells are explained in Appendix B.

Table 6: 27 Research findings on subjective well-being and debt components

	Same-time correlation (cross-sectional)				Over-time correlation (longitudinal)			
	bivariate	partial			bivariate	partial		
		OLS	OPL	IV		OLS	OPL	IV
Secured debt								
Mortgage		+ + −	− +	+		+ + + + + + −	+	
Business loan		+		+				
Unsecured Debt								
Student loan	−	−						
Microfinance loan		+	+					
Others (unspecified)	− − − − −	+/−		+/−				

Methods mentioned in the header of this table are explained in Appendix A. Signs used in the cells are explained in Appendix B.

Table 7: 151 Research findings on subjective well-being and assets: Split by nations

	Same-time correlation (cross-sectional)				Over-time correlation (longitudinal)			
	bivariate	partial			bivariate	partial		
		OLS	OPL	IV		OLS	OPL	IV
Europe	+	+ +/+						
Latin America	+							
Australia	+ + +	+ + +	+/+			+ + +		
	+ + +	+ +	+/+			+ +		
	+	+/−						
China		+ + +	+/−	+ −				
		+ + +						
		+ +						
		+/− −						
Germany	+ +/+	+ + +	+ + +	+/−		+ + +	+	
		+ + +	+			+		
		+ + +						
		+ −						
The Netherlands	+ + +	+ + −	+					
	+							
UK	+ + +	+ +				+		
	+ +/−							
US	+ + +	+ + +	+ −			+ +		
	+ + +	+/+						
	+/−	+ +						
		+ +/−						
		+/−						
		+/−						
		+/−						
Others	+ + +	+ + +	+ + +			+	+	
	+ + +	+ +	+ + +					
	+ + +	+ +	+ + +					
	+/+	+ + +	+/− -					
	+/+ +	+ +/−						
	+ + +	−/− - -						
	+ + +	- -						
	+ + +							
	− −							

Methods mentioned in the header of this table are explained in Appendix A. Signs used in the cells are explained in Appendix B.

Table 8: 32 Research findings on subjective well-being and debt: Split by nations

	Same-time correlation (cross-sectional)				Over-time correlation (longitudinal)			
	bivariate	partial			bivariate	partial		
		OLS	OPL	IV		OLS	OPL	IV
Europe								
Australia	− − − −					−		
China		+ +/− −		+/− +/−		+ + + + + + −		
Germany		+/+					−	
The Netherlands								
UK								
US	−	−						
Others	−	−/− +/+ + +	+ − +					

Methods mentioned in the header of this table are explained in Appendix A. Signs used in the cells are explained in Appendix B.

Table 9: 70 Research findings on subjective well-being and net wealth: split by populations

	Same-time correlation (cross-sectional)				Over-time correlation (longitudinal)			
	bivariate	partial			bivariate	partial		
		OLS	OPL	IV		OLS	OPL	IV
Net wealth								
Female/**M**ale		+F +M						
Rural/**U**rban		+R	+/–R	–R				
Young/**M**id/**O**ld	+O +O	+O +M **+O** **+O** +O +O +O +O +O +O +O **–O** **–O** **–O** –O –O –O	+O +O			+O	+O	
Assets								
Female/**M**ale	+F –F +M	+/–F						
Rural/**U**rban	–R –R	+U +U +R +R +R –R	+/–U +R	+U				
Young/**M**id/**O**ld	+M	+/+O +O –O –O	+Y +O					
Migrants		+ –						
Debt								
Female/**M**ale						+F +M		
Rural/**U**rban		+U +/–R –U		+/–U +/–R		+U +U +U –R		
Young/**M**id/**O**ld		–/–**O** +/+O +/+O	–Y					

Methods mentioned in the header of this table are explained in Appendix A. Signs used in the cells are explained in Appendix B.

Table 10: 12 Research findings on happiness and wealth split by measures of happiness

	Same-time correlation (cross-sectional)				Over-time correlation (longitudinal)			
	bivariate	partial			bivariate	partial		
		OLS	OPL	IV		OLS	OPL	IV
Net wealth	O>M							
	O>M							
Total assets								
Financial assets								
Real assets	O>A	O=A	O=M					
	O>A	O=A	O=M					
	O>A	C=O=M						
Total debt	O>M							
	O>M							
Secured debt								
Unsecured debt								

O = Overall happiness, A = Affect, C = Contentment, M = mixed measure.