c:\bruce\germany\happiness recipes\altruval.do…famval.do…matval.do….religious values.do
c:\bruce\germany\soep33wavesk.dta
c:\bruce\germany\SOEP conference paper version 3 alternative recipes.doc

‘One Size Does Not Fit All’:
Alternative Values-Based ‘Recipes’ for Life Satisfaction

Bruce Headey
Melbourne Institute of Applied Economic & Social Research
University of Melbourne

** 13th German Socio-Economic Panel (SOEP) User Conference, Berlin Brandenburg Academy of Sciences, July 19-20 2018.

Abstract

In most previous research on the determinants of Life Satisfaction (LS), there has been an assumption, usually unstated, that 'one size fits all'. It has been assumed that the covariates and potential causes of high and low LS are similar for everyone, or at least everyone in the Western world. Even the newer literature on LS in low and middle income countries appears to rest on the same assumption, except for recognition of the greater importance of income, health and governmental corruption (United Nations, *World Happiness Reports*, 2012-17).

In this paper, using longitudinal data from the German Socio-Economic Panel (SOEP), we estimate structural equation models based on *alternative 'recipes' for high and low LS*. Specifically, we indicate that there appear to be *four distinct 'recipes'*, which are primarily based on the *values/life priorities* of different subsets of the population. These values/life priorities are: altruistic/pro-social values, family values, materialistic (money and career) values, and religious values (Kluckhohn and Strodtbeck, 1961).

By a 'recipe' we mean a conceptually and empirically linked set of values, behavioural choices and domain satisfactions which prove to have substantial effects on LS. For example, the altruistic 'recipe' involves giving high priority to altruistic, pro-social values and making the behavioural choices of engaging in volunteer work, regularly attending community events, and meeting often with friends, relatives and neighbours to provide help and support as well as friendship. Altruistic values and behavioural choices are then linked to high levels of satisfaction with volunteering and with one's social life.

The evidence indicates that individuals who follow recipes based on altruistic, family or religious values record above average long term LS, whereas the materialistic values 'recipe' is linked to below average LS.

In estimating structural equations, we exploit the longitudinal nature of the data by modelling values as temporally and causally prior to behavioural choices, which in turn are viewed as causally prior to domain satisfactions and LS.

Keywords: life satisfaction; recipes; values/life priorities; behavioural choices

'One Size Does Not Fit All':
Alternative Values-Based 'Recipes' for Life Satisfaction

Introduction

Does one size fits all?

In most empirical research on the determinants of Life Satisfaction (LS), there has been an unstated assumption that 'one size fits all'. In other words, it has been assumed that the covariates and potential causes of high and low LS are the similar for everyone, or at least everyone in the Western world (Diener et al, 1999). Even the newer literature on LS in low and middle income countries appears to rest on the same assumption, except for recognition of the greater importance of income, health and governmental corruption (Deaton, 2008; Helliwell, Layard and Sachs, 2012-17).

In this paper, using longitudinal data from the German Socio-Economic Panel (SOEP), we investigate evidence of *alternative 'recipes' for high and low LS*. Specifically, we indicate that there appear to be *four distinct 'recipes'*, which are primarily based on the *values/life priorities* of different subsets of the population (Kluckhohn and Strodtbeck, 1961). These values/life priorities, which provide the base for the recipes, are:

- altruistic/pro-social values
- family values
- materialistic values
- religious values.

What exactly do we mean by a 'recipe'? We mean a conceptually linked set of *(1) values (2) behavioural choices* and *(3) domain satisfactions*, which we hypothesise to be empirically linked to each other, and to have substantial effects on overall LS. For example, the altruistic 'recipe' involves giving high priority to altruistic, pro-social values which we hypothesise are linked to the behavioural choices of engaging in volunteer work, frequent attendance at community events, and meeting often with friends, relatives and neighbours to provide help and support as well as friendship. Altruistic values and behavioural choices are then expected to be linked to high levels of satisfaction with volunteering and with one's social life.

It transpires that individuals who prioritise altruistic values (like adherents of the other recipes) tend to have spouses/partners (and, indeed, children) who share their values (Winkelman, 2004; Aguche and Trommsdorff, 2010; Schimmack and Lucas, 2010; Headey, Muffels and Wagner, 2014). To some extent, they also have personality traits which appear to predispose them to altruism, in that they rate somewhat higher than average on the traits of openness to experience and agreeableness (Costa and McCrae, 1991).[1]

The evidence shows that that three of these recipes – the altruistic, family and religious recipes – may be regarded as relatively 'successful' in that they deliver higher than average levels of long term LS, while the materialistic recipe appears less 'successful' in that it delivers below average LS. It is suggested that one reason why the first three recipes tend to be relatively 'successful' is that they involve pursuit of *non-zero sum goals*. That is, one person's gains in pursuing altruistic, family or religious goals do not imply losses for anyone else. By contrast, pursuit of materialistic– money and career goals – is competitive, so that gains achieved by one person usually imply losses for others.

There is actually a fifth recipe, or perhaps non-recipe, which is even less 'successful'. Some panel respondents do not give high priority to any of the values listed in the SOEP questionnaire; they fall into a category that could be labelled 'Nothing Valued'. These respondents record lower levels of LS than any of the other four groups.

In assessing gains and losses due to the differing recipes, we use two multi-year measures of LS. The *Grand Mean of LS 2007-16* is an individual's LS rating, averaged over the 10-year period 2007-16. The *Grand Standard Deviation of LS 2007-16* is the standard deviation of each individual's LS ratings, measured over the same period. The Grand Standard Deviation is a measure of the variability or *volatility* of individual LS (Headey and Muffels, 2017). It is analogous to using over-time standard deviations to measure the volatility or risk profile of financial portfolios (Markowitz, 1952).

SOEP began in 1984, but in this paper we are analysing data only for 2003-16. It is in this later period that SOEP has collected data that make it possible to investigate alternative recipes. Questions about values/life priorities have been asked since 1990. However,

[1] Agreeableness could equally well be termed cooperativeness (Costa and McCrae, 1991).

questions relating to personality traits, and also about satisfaction with volunteering, and with one's social life and family life have only been asked since the early 2000s.

Previous research: the implication that 'one size fits all'

In challenging the claim that most research on LS has implied that 'one size fits all', we are not attacking a straw man. Here are some statements, all from leading academic researchers in the LS field:

- **"The seventy-five years and twenty million dollars expended on the Grant Study point … to a straightforward five-word conclusion: 'Happiness is love.** Full stop.'" (Vaillant, 2013).
- "Psychological wealth includes life satisfaction, the feeling that life is full of meaning, a sense of engagement in interesting activities, the pursuit of important goals, the experience of positive emotional feelings, and a sense of spirituality that connects people to things larger than themselves. Taken together, these fundamental psychological experiences constitute true wealth" (Diener and Diener, 2008).
- " The most salient characteristics shared by the 10% of students with the highest levels of happiness and the fewest signs of depression were their strong ties to friends and family and commitment to spending time with them" (Diener and Seligman, 'Very happy people', 2002).
- "The secrets to happiness are: a happy marriage, skill in the daily round – a fulfilling job pitched at a realistic level, and some all-absorbing private interest" (Argyle, 2002).
- "Six key variables contribute to explaining the full sample of national average happiness scores over the whole period 2005-2015. These variables include GDP per capita, social support, healthy life expectancy, social freedom, generosity and absence of corruption" (United Nations, *World Happiness Report*, 2016).

'Positive psychology' researchers, who tend to focus more on positive emotions (love, joy…) than LS, also generally imply that 'one size fits all'. The best known 'positive psychology' formulation is PERMA (Petersen, 2006; Seligman, 2011). That is, human beings flourish when their lives are characterised by **P**leasure, **E**ngagement, (good) **R**elationships, **M**eaning and **A**ccomplishment (Seligman, 2011). Another well known formulation, part of Fredrickson's (2009) 'broaden and build' theory of personal development is the 'Logada

ratio'; the claim that human beings function best when they experience about two-thirds positive emotions and one-third negative (Fredrickson and Logada, 2005).

However, when positive psychologists tailor interventions to assist individuals, they recognise the possibility that people may approach happiness differently. They advise individuals (and provide questionnaires to help) to identify their 'signature strengths' – primarily emotional strengths – and to tailor their activities in order to give maximum play to these strengths (Petersen, 2006; Seligman, 2011; Huppert and So, 2013). Lyubomirsky (2007) is an exception to the 'one size fits all' categorisation in that she explicitly states "that there is no one magic strategy that will help every person become happier". In her view, what is needed is a satisfactory 'person-activity fit', so that an individual engages in 'happiness activities' which fit his/her emotional strengths.

Research on the effects of values/life priorities/life goals on LS

It would take a lengthy encyclopaedia entry to cover the voluminous research literature on human values, defined as the priorities (goals) people rate as 'important' to them, and desire to live by. A central issue in this research has always been the extent to which, and the conditions under which values (priorities, goals…economists would just say 'preferences'), rather than situational factors, predict behaviour (Fishbein and Ajzen, 1974; Ajzen and Fishbein, 1980).[2] Here, we just focus on research that has investigated links between values and LS.

After a thorough investigation, two pioneers of SWB research, Andrews and Withey (1976), gave a negative report on the value of values in LS research. They followed the standard approach of the time in compiling a long list of potentially 'important values' and asking survey respondents to rate them on a scale running from 'not at all important' to 'very important' (Rokeach, 1973; but see Cantril, 1965). Responses appeared subject to social desirability bias, with almost all respondents giving high ratings to family values. Another problem was that importance ratings had low test-retest reliability. Finally, Andrews and

[2] Fishbein and Ajzen's theory of reasoned action has provided a framework for much of the debate. Their focus is more on the attitude-behaviour link, rather than values and behaviour, but values may be regarded as one type of attitude.

Withey found that there was no way they could make use of their values data to improve predictions of LS.[3]

Perhaps deterred by Andrews and Withey's evidence, later LS researchers have made only sporadic efforts to assess links between values and LS. Emmons (1986, 1988, 1992) reported that just having goals/values (rather than being value-free) increases LS by giving people a sense of agency and purpose. He also found that happy people's goals are more congruent with each other than unhappy people's goals, and that goal achievement increases positive affect (see also Cantor and Sanderson, 1999). Diener and Fujita (1995) examined links between goals and resources, and found that happy people were better than unhappy people at selecting goals for which they had appropriate resources. Diener and Seligman (2002) and Nickerson, Schwarz, Diener and Kahneman (2003) reported that individuals who prioritise financial and career success ("the dark side of the American dream") were less happy than their less materialistic countrymen/women. Dunn, Aknin and Norton (2008) provided experimental data showing that people who spent money that had been donated to them on other people, rather than themselves, gained greater satisfaction from their expenditure. Studies of volunteering – a clear form of altruistic behaviour – have shown that volunteers have above average levels of LS (Harlow and Cantor, 1996; Thoits and Hewitt, 2001).

The SOEP research team, starting in the 1990s, adopted an approach to values measurement that has proved fruitful. Instead of deploying a long list of miscellaneous values, they based their questionnaire items on a classification of values developed by Kluckhohn and Strodtbeck (1961). Rewording some items, they set out to measure just three sets of values: altruistic values, materialistic values (money and career success), and family values (Richter, Metzing, Weinhardt and Schupp, 2013). The scales they developed proved to have a stable factor structure and adequate test-retest reliability; details are given in the Methods section.

In a previous paper, analysing SOEP data, Headey (2008) reported that respondents who prioritise either altruistic or family values record higher LS than those who prioritise materialistic values. This paper extends that line of inquiry by showing links between values and closely linked behavioural choices and domain satisfactions.

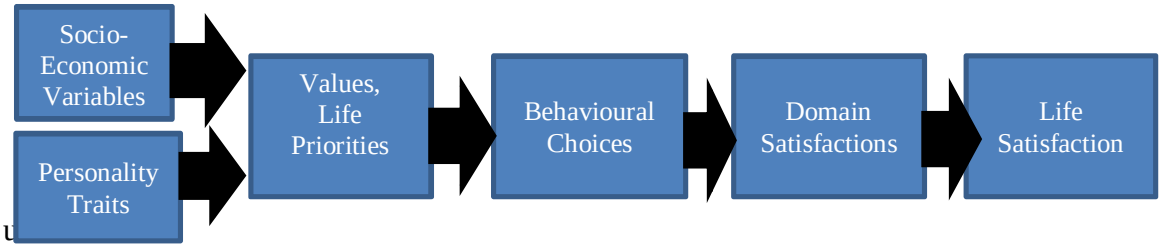
[3] They hypothesised that they would find statistically significant interactions between satisfaction in particular life domains and the importance attached to those domains, such that people who were highly satisfied in life domains that they rated as 'important' would record increased levels of LS, over and above the levels predicted by the domain satisfactions alone. No significant interactions were found.

Our approach: concepts and possible causal links

It seems fair to say that, despite these sporadic ventures, the 'one size fits all' approach has continued to hold sway. In particular, the challenge of showing (or failing to show) that values/life priorities affect behaviours and domain satisfactions, and through them LS, has not been taken up.

Our approach is to estimate structural equation models based on the concepts and possible causal links set out in Figure 1:

Figure 1: Concepts and assumptions about possible causal links[a]



u

a. To avoid clutter, Figure 1 only shows arrows linking variables adjacent to each other in the model. Some additional direct links (e.g. from personality traits to LS) are also estimated.

The outcome variable here is *Life Satisfaction (LS).* At the first step of the model are both *socio-economic variables* (e.g. years of education, household net income) *and personality traits* (e.g. neuroticism, risk aversion), which are viewed as causally antecedent to *individual values/life priorities*. Socio-economic variables are included mainly as 'controls'. Clearly, personality traits need to be in the model, since it is known that LS is substantially affected by the traits of neuroticism, extroversion, agreeableness and conscientiousness (Lucas, 2008).

At the second step of the model are the *values/life priorities* which, we hypothesise, primarily drive *behavioural choices* (e.g. voluntary work, time spent with family/relatives, hours of work, church attendance). Socio-economic variables, traits, values and behavioural choices then influence *domain satisfactions* (e.g. satisfaction with family, friends, voluntary work, job, income). Finally, all antecedent variables jointly influence *Life Satisfaction*.

As mentioned, many people have partners/spouses who also share their values, behavioural choices and domain satisfactions. To avoid clutter, partner variables are not shown in Figure 1, but may be envisaged as running parallel to an individual's own characteristics.

Estimation: longitudinal structural equation models, covering 5 year periods from 2003-07 to 2012-16

The models in this paper are estimated using Stata's structural equation modelling software (StataCorp., 2017). By setting out the causal sequence in which variables are hypothesised to take effect, Figure 1 implies a time sequence. LS is the final outcome variable: we allow for

time lags by modelling socio-economic variables and personality traits lagging LS by four years, values lagging by three years, behavioural choices by two years, and domain satisfactions by one year. In the Results section we give pooled results for all 5-year periods (2003-07, 2004-08…2012-16). A detailed description of our approach and methods follows in the next section.

Data and methods

The German Socio-Economic Panel (SOEP)

Data come from the German Socio-Economic Panel (SOEP) for the years 2003-16.

SOEP was launched in 1984 in West Germany with a sample of 12,541 respondents (Frick, Schupp and Wagner, 2007). Interviews have been conducted annually ever since. Everyone in sample households age 16 and over is interviewed. In order to maintain representativeness, 'split-offs' (e.g. children who leave the parental home to set up their own household) and their new family members (if any) join the panel. The sample was extended to East Germany in 1990, shortly after the Berlin Wall came down, and since then has been boosted by the addition of new immigrant samples, a special sample of the rich, and recruitment of new respondents partly to increase numbers in 'policy groups' (e.g. welfare recipients). Over 80,000 people have now been interviewed, including some grandchildren as well as children of the original respondents.

The sample used in this paper comprises prime age respondents age 25-54, and is for the years 2003-16. The reason for the age restriction is that, in analysing family values, we want to focus on people in their main child-rearing years, and in analysing material (career and money related) values, we need to focus on working years. The reason for restricting the time period is that, as mentioned, SOEP only began to include some of the variables required for this paper in the early 2000s.

Dependent variables: single and multi-year measures of LS, and individual differences in volatility over time

LS is measured annually on a 0-10 scale ('totally dissatisfied' to 'totally satisfied') with a mean of 6.86 and a standard deviation of 1.72. Single item measures of LS are plainly less satisfactory than the best available multi-item measures, but they are internationally widely

used in household panel surveys and have been reviewed as acceptably reliable and valid (Diener, Suh, Lucas and Smith, 1999).

For ease of interpretation, the LS scale has been transformed to run from 0-100 instead of 0-10. This means that coefficients linking explanatory variables to LS can be conveniently interpreted as quasi-percentiles.

The Grand Standard Mean and the Grand Standard Deviation (Volatility) of LS
As well as including annual measures of LS in statistical models, we also make some use of multi-year measures: the Grand Mean of LS 2007-16 and the Grand Standard Deviation of LS 2007-16. An individual's Grand Mean is his/her mean level of satisfaction for the decade 2007-16, and the Grand Standard Deviation is her/her standard deviation for the period.

The concept of a Grand Mean is familiar from statistical textbooks. The Grand Deviation requires some explanation. In previous papers, using SOEP data, we graphed individual trajectories of LS over periods up to 25 years. The graphs make it immediately clear that many people's lives are 'a wild ride' in the sense that they experience multiple periods of relatively high and relatively low LS, even if (in some cases) their mean level is unchanged in the long term. At the other end of the spectrum, some individuals report much the same level of LS year after year. So, as well as trying to account for differences in levels of LS, it also appears worthwhile to try and explain individual differences in volatility/variability over time. In doing this, we assume that most people would regard a high degree of LS volatility as undesirable, although this could perhaps be regarded as an unnecessarily risk-averse preference.

In financial circles, the standard measure of the volatility (or riskiness) of a financial instrument or share portfolio is its longitudinal standard deviation (Markowitz, 1952). Our measure of the volatility of LS is based on the same idea.[4]

[4] One detail: we exclude from the Grand SD measure those respondents who recorded either a steady upward rise or a steady decline in LS during the period. These respondents recorded high Grand SDs, not because their LS was volatile, but because of continuing, steady change.

Explanatory variables: accounting for variance in LS levels and volatility

As previously mentioned, several sets of (potentially) explanatory variables will be invoked in accounting for levels and volatility of LS: individual socio-economic characteristics, personality traits, values/life priorities, behavioural choices, and domain satisfactions.

Socio-economic characteristics

Reviews of LS research routinely report that a person's socio-economic characteristics have only small effects on his/her LS (Argyle, 2001; Diener et al, 1999). However, it is still sensible to include socio-economic variables in statistical models, if only as 'controls', and to remain alert for possible significant effects on LS. The following variables have been included in all equations underlying results reported in this paper: gender (female=1 male=0), age, partner/marital status (partnered=1 not partnered=0), years of education, household net income (natural logarithm), unemployed (unemployed=1 other=0), disability status (disability=1 other=0), East German (East=1 other=0) and foreign (foreign=1 German=0).

Personality traits

The main personality traits measured in SOEP are the so-called Big Five, which many psychologists regard as adequately describing normal or non-psychotic personality: neuroticism, extroversion, openness to experience, agreeableness and conscientiousness (Costa and McCrae, 1991). Since the traits are partly genetic and quite stable in adulthood (Lykken and Tellegen, 1996; Lucas, 2008), it clearly makes sense to treat them as causally antecedent to values, behavioural choices and satisfactions.

An additional personality trait, measured in SOEP in recent years, is risk willingness (risk aversion). It is measured on a 0-10 scale on which respondents are asked how willing they are personally to take risks.

Personal values/life priorities

As mentioned, the SOEP research team set out to measure three sets of values/life priorities, based on a classification proposed by Kluckhohn and Strodtbeck (1961).

- *Altruistic, pro-social values*: being there for others, friendship, social and political activism[5]
- *Family values*: marriage, children and the home
- *Materialistic values*: money, career success, self-fulfillment, seeing the world.

Items measuring values were first included in the SOEP questionnaire in 1990, and have subsequently been included in 1992, 1995, 2004, 2008, 2012 and 2016 (Richter et al, 2013). Nine or ten questions are asked at each wave; there have been a few minor changes in wording. Each question is answered on a 1-4 scale running from 'very important' to 'not at all important'.[6] It should perhaps be noted that respondents are simply asked about the general importance of each value; they are not asked about its importance specifically for LS.

Factor analysis of each wave of data indicates that a stable three-factor solution is always found. However, in our view, three of the questionnaire items lack face validity, although they load satisfactorily on their intended factor. The items retained for measuring *materialistic values (money and career success)* are 'being able to afford things for myself' and 'success in my career'. Items about the importance of self-fulfillment (Sich selbst verwirklichen) and of 'seeing the world, travelling a lot' were dropped because they lacked face validity. Items retained for measuring *family values* are 'having a happy marriage/partnership' and 'having children'. An item relating to 'owning your own home' was dropped on face validity grounds, and also because in some waves it loaded moderately on the materialistic factor. The two items measuring *altruistic values* are 'being there for others' and 'being politically and/or socially involved'. An item relating to the importance of friendships was asked in earlier waves of SOEP, but then dropped.

The retained items were used to construct a materialistic values index, a family values index and an altruistic values index. It would have been possible to use factor scores rather than these indices in model estimation, but it transpired that the indices have somewhat stronger

[5] We use the terms 'pro-social' and 'altruistic' to refer to values which favour behaving cooperatively and helping others. In evolutionary biology altruism is defined as behaviour which involves a loss/cost to the individual concerned, as well as gains to others; we do not imply that here.

[6] We reversed the scale so that a high rating means 'very important'.

links to the behavioural choices and domain satisfactions to which we predict they should be related.

In view of Andrews and Withey's (1976) report that items measuring values have low test-retest reliability, it is pleasing to record that altruistic values in 2012 correlated 0.48 with the same values in 2016, materialistic values correlated 0.56, and family values 0.65. This compares with a 4-year correlation for LS over the same period of 0.53. Of course, 4-year correlations should be regarded as stability measures, not measures of test-retest reliability, but it is reasonable to infer that most respondents' values are not subject to excessive and implausible fluctuations.

Andrews and Withey's other main concern was that values measurement is subject to social desirability bias. There is perhaps some evidence of this in the SOEP data, particularly with regard to family values, which receive a mean rating of 3.15 (s.d = 0.61) on the 1-4 'importance' scale. However, it is reasonable to think that most people really do attach considerable importance to family life. We also find that ratings on the family values index correlate in expected ways with behavioural choices (time spent with relatives, hours spent on home repairs and yard work etc). This would surely not be the case if responses reflected little more than social desirability bias.

Religious values are not included in the list of values which the SOEP team took from Kluckhohn and Strodtbeck (1961). However, a single item about the 'importance' of faith (Glaube) and religion has been included in the 1994, 1998, 1999, 2013 and 2016 questionnaires. It is measured on the same 1-4 scale as other 'importance' items.

Behavioural choices

The behavioural choices that we hypothesise to be positively linked to altruistic values are frequency of *volunteering*, asked on a 1-5 scale ('never' to 'daily'), frequency of *attending community events* (Buegerinitiativen) also asked on a 5-point scale, and a two-item index – *meet/help friends, relatives and neighbours* – which combines answers to questions on frequency of reciprocal visits to friends, relatives or neighbours, and frequency of helping out

friends, relatives or neighbours (1-5 scale).[7]

The behavioural choices hypothesised to be positively related to family values are the number of children a person has had,[8] number of hours per day on child care, and hours on home repairs and yard work.[9] Frequency of visiting family and relatives (1-5 scale) is also expected to depend on family values. The children and 'hours' variables both have long upper tails, so the natural logarithm (ln) of these variables is used in estimation.

We expect people who prioritise materialistic values to work longer hours than average and to earn more. It also seems likely that they will report feeling overworked. House of work per week (in all jobs combined if a person has more than one job) are measured annually in SOEP. The natural logarithm of the variable is used in estimation. In addition to being asked how many hours they actually work, respondents also report their preferred hours; the hours they would like to work. The difference between the two measures may be regarded as a rough indication of whether individuals are succeeding in making their preferred trade-off between work and leisure (or work and family); a trade-off central to welfare economics. In this paper we classify respondents whose actual hours are within plus or minus three of their preferred hours as achieving the trade-off they want. Those who work over three hours more than they want are categorised as 'overworked' (1-0), and those who work over three hours less than they want are labelled 'underworked'(1-0).[10]

The most obvious behaviour we expect of people who espouse religious values is attendance at church (mosque, synagogue) services and other religious events. Frequency of attendance is measured in SOEP on a 1-5 scale running from 'never' to 'daily'. We also expect that religious people engage more in volunteering activities than most others. Last, we expect them to be strongly family-oriented, and so hypothesise that they visit more than average

[7] In previous papers we have referred to this as a social participation index.
[8] The variable included here measures the number of children a person has ever had (not the number currently living in the household).
[9] We use a measure of mean hours per weekday spent on these tasks, not total hours per week. The reason for this decision is that hours spent per weekday on various tasks is asked every year in SOEP, whereas additional data for Saturday and Sunday are collected only in alternate years. In practice, correlations between weekday measures and 'total week' measures are all over 0.90, and mostly over 0.95, so relationships with other variables (e.g 'family values') are virtually the same whichever measure is used.
[10] It may seem odd to treat 'overworked' and 'underworked' as behavioural choices. However, it is standard in economics to treat labour supply (hours worked) as a choice.

with family and relatives, and spend more time than most people in providing personal care (e.g. for elderly parents).[11]

Asking respondents to give estimates of the time they 'usually' spend on various activities is the standard approach in longitudinal and other surveys that are not exclusively focussed on time uses. Most reviews indicate that this method, while less accurate than detailed time use diaries, produces adequate rank order data for comparing the activity patterns of different population groups (Juster, Hiromi and Stafford, 2003).

Domain satisfactions

The domains satisfactions most relevant to altruistic values are satisfaction with volunteering activities and satisfaction with one's social life. Satisfaction with family life is obviously the key domain for people who prioritise family values, while job satisfaction and satisfaction with income are most relevant for people with materialistic values.[12] Questions about these domain satisfactions are answered on the same 0-10 scale as LS. Domain satisfaction scales, like the LS scale, have been transformed to run from 0-100 for clarity of presentation.

There is no domain satisfaction in SOEP which is obviously appropriate for people who prioritise religious values; no question, for example, about satisfaction with one's religious fulfilment. However, we hypothesised that religious people give quite high priority to family life, and also to volunteering. So, as fall-back options, we included satisfaction with these two domains in models dealing with religious values.

Partners: measuring the values, behaviours and satisfactions of partners/spouses

One of the strengths of SOEP is that interviews are held with both partners (spouses) in sample households (plus others age 16 and over). So it is straightforward to include partner values in our analyses, and also partner behavioural choices and domain satisfactions…and to assess whether they make a difference to outcomes, over and above the effects of respondents' own ratings on these measures.

[11] Only 15% of respondents reported providing personal care. So a dummy variable was used in estimation, rather than a logarithmic transformation.

[12] We used satisfaction with household income, rather than personal income, in our estimations because the former question is asked every year in SOEP, while the latter has only been asked intermittently. However, results were very similar, regardless of the question included.

Imputations/or really just interpolations for missing years

Not all questions are asked every year in SOEP, so in order to avoid too many data gaps, some missing values are imputed. For example, questions about values/life priorities have been included every four years; in 2004, 2008, 2012 and 2016. We impute missing values simply by inserting values from the nearest non-missing year, or the nearest two non-missing years, if two are equidistant from the missing year in question.

Imputation of missing values for personality traits is necessary to avoid large data gaps, but is somewhat problematic. Most psychologists believe that personality is nearly stable in adulthood, but the SOEP data appear to show non-trivial changes between 2005, 2009 and 2013 (Shaefer, 2017); the years in which data on the Big Five traits were collected. For present purposes, we decided to assume that traits are stable. So we calculated each respondent's mean value on each trait, averaged over available years. These mean values were then imputed for missing years.

Panel effects

In any panel survey, what are called 'panel conditioning effects' are a possible source of bias. That is, panel members might tend to change their answers over time – and answer differently from the way non-panel members would - as a consequence just of being in a panel. There is evidence that SOEP panel members (like members of other panels) tend to report higher LS ratings in their first few years of responding than they do in later years (Frijters, Haisken-DeNew and Shields, 2004). This could be due to 'social desirability bias'; a desire to look good and appear to be a happy person, which is stronger in the first survey years than later. Or it could perhaps be due to a 'learning effect'; learning to use the middle points of the 0-10 scale, rather than the extremes and particularly the top end.

To compensate for these possible sources of bias, all results are based on equations that include a variable 'controlling' for the number of years panel members have been in the survey.

Data analysis: structural equation modelling

Structural equation modelling, rather than OLS regression, is usually necessary when the aim is to estimate a set of equations, rather than a single equation.[13] The structural equations in this article are estimated by maximum likelihood analysis.[14]

The equation underlying a standard structural equation model, expressed in matrix form, is:

Y = BetaY + GammaX + alpha + zeta

In this notation, Beta is the matrix of coefficients for those endogenous variables (Y) which predict other endogenous variables. Gamma is the matrix of coefficients linking exogenous variables (X) to endogenous variables (Y). Alpha is a vector of the intercepts of the endogenous variables. The error terms, the zetas, are assumed to have a mean of zero and to be uncorrelated with X variables in the same equation.

Maximum likelihood coefficients and standard errors can be given the same interpretation as regression coefficients. However, assessing the 'goodness of fit' of structural models is more complicated than for regression models. It is necessary to assess the overall fit between estimates for several equations and the input data for the model (a variance-covariance matrix).[15] Several measures of fit are conventionally used. The root mean squared error of approximation (RMSEA) is directly based on comparing differences (residuals) between the actual input matrix with the matrix implied by model estimates. It has become conventional to regard a RMSEA under 0.05 as satisfactory (Bentler, 1990; Browne and Cudeck, 1993).

[13] Regression analysis is primarily a single equation technique. Regression estimates derived from multi-equation systems are likely to be biased, due to correlations between explanatory variables and error terms in some or all equations. A key assumption of OLS regression is that such correlations are zero.

[14] ML estimates are usually consistent and asymptotically normal under the (not very restrictive) assumption of *conditional normality* (StataCorp, 2017). Only paths or covariances linking conditioning (i.e. control) variables may not be consistent and asymptotically normal (even then, the main problem lies just with estimates of standard errors). These paths are not usually of substantive interest. Substantive interest lies in paths (1) linking exogenous with endogenous variables and (2) between endogenous variables.

[15] From a mathematical standpoint, a model can be viewed as a set of constraints - or a set of restricted paths - limiting the possibilities of simply reproducing the input data. Attempts by a researcher to improve his/her model involve modifying these constraints to improve model fit…subject to the theory/hypotheses underlying the model.

More complicated assessments of the fit of one's entire model are provided by the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI). The CFI is based on a likelihood ratio (LR) chi-square test and takes account of the contribution of each estimate in the model to overall goodness of fit. The TLI is also derived from an LR chi-square test, and is useful because it rewards parsimony by adjusting for the degrees of freedom in one's model. So it penalises models that include explanatory variables which account for little variance, even though they may be just statistically significant. CFI and TLI fits above 0.90 are conventionally regarded as satisfactory, although some reviews recommend 0.95 (Bentler, 1990; Browne and Cudeck, 1993; Satorra and Bentler, 1994). In models with large numbers of variables, such as ours, CFI and TLI estimates tend to become less satisfactory (Kenny and McCoach, 2003).

Another valuable measure of fit is the coefficient of determination (CD). In regression analysis the CD (R-squared) only applies to the dependent variable. In structural equation models the CD is a measure of fit of the whole model; that is, it relates to variance accounted for in all endogenous variables in the model.

In summary, the measures of fit we use are the RMSEA, the CFI, the TLI and the CD.[16] Also reported are the likelihood ratio (LR) chi-square tests on which CFI and TLI measures are based. The LRs by themselves have no useful meaning; given large sample sizes they are always significant at the 0.001 level.

We used the STATA 14 module for structural equation modelling to generate the results reported here (StataCorp., 2017). This package offers a range of estimators, including maximum likelihood, and includes the tests of goodness of fit described above.

Initial model estimates were generated using standard maximum likelihood analysis. However, in final models runs, we used the 'full information' maximum likelihood procedure (FIML). FIML involves estimating missing values as part of the overall maximum likelihood estimation. FIML estimates are preferred, because the usual procedure of listwise deletion of cases which are missing on any single variable is liable to yield seriously biased estimates

[16] Another commonly used measure, also based on residuals, is the Standardised Root Mean Squared Residual (SRMR). However, this is not applicable when missing values are imputed, as is the case in all our final model runs.

(StatCorp, 2017).[17] Technically, use of the FIML option only requires an assumption that data are missing at random (MAR); cases do not have to be missing completely at random (MCAR).

Strictly speaking, maximum likelihood estimation requires an assumption of multivariate normality, with endogenous variables being measured on an interval or ratio scale. In fact, most of the endogenous variables in our equations, including LS and domain satisfactions, are measured on ordinal scales. Rightly or wrongly, it has become fairly routine in research on LS to treat these data as if they were interval-level. Andrews and Withey (1976) were the first LS researchers to recommend that, since results using interval-level statistics generally led to the same substantive conclusions as those using ordinal statistics, it was preferable to make 'strong' assumptions and so be able to use more powerful statistical tests. Many researchers since have followed their lead.

An important practical reason for making interval scale assumptions in structural equation modelling is that, although it is feasible to estimate models with ordinal, binary, count or multinomial endogenous variables, few measures of model fit are available, so it is often practically impossible to assess whether one model is statistically preferable to another.[18] In preparing this paper, we re-ran all models (see Tables 1-4), using Stata's Generalized Structural Equation Modelling (GSEM) software (StataCorp., 2017). It was reassuring that the inferences to be drawn from the estimates of main interest, relating to values, were similar to those reported in the Results section.

Results – 'one size does not fit all'

We first give estimation results for each LS 'recipe'. Then we consider the effects on LS of following each 'recipe'; the issue here is whether the 'recipe' promotes or diminishes LS.

[17] The sample Ns reported in the Results section refer to the original sample size, not the revised sample size after missing values were imputed.

[18] The LR Chi-square test can be used, but only applies to pairs of models in which one model is a nested version of the other. This makes it impractical for assessing large models, which the researcher may want to keep modifying in numerous (hopefully) minor ways. Alternatives to the LR test have been proposed in the statistical literature, but there is no agreement yet on which tests are appropriate for GSEM models (StataCorp, 2017).

Altruistic values recipe

The core of the altruistic 'recipe' consists of links between altruistic values, the behavioural choices of engaging in voluntary work, attending community events, and meeting/helping friends, relatives or neighbours…and gaining substantial satisfaction from volunteering and one's social life.

Table 1 gives estimation results in four panels, reflecting the four steps in the model. Panel 1 shows the effects on altruistic values of lagged socio-economic variables and personality traits. Panel 2 gives the effects on behavioural choices of lagged socio-economic variables, traits and altruistic values. In panel 3 the outcome variables are domain satisfactions – satisfaction with volunteering and one's social life – and the explanatory variables are lagged socio-economic characteristics, traits, values and behavioural choices. In panel 4 the outcome variable is LS with variance being accounted for by lagged socio-economic variables, traits, values, choices and domain satisfactions.

Results for all 5-year overlapping periods (2003-07, 2004-08…2012-16) are combined. To avoid clutter, only relationships which are statistically significant at the 0.05 level or better are shown in Table 1. Additional parameter estimates, essential for model fit, but of little substantive interest, are described in the Appendix.

Results of main interest, relating to the effects of values on behavioural choices, domain satisfactions and LS, are printed in bold.

INSERT TABLE 1 HERE

Before discussing results, it should be mentioned that the fit of this model is satisfactory. The RMSEA is 0.03. The comparative fit index (CFI), which measures overall model fit, is 0.95 and the Tucker-Lewis index (TLI), which rewards model parsimony, is 0.88. The coefficient of determination (CD) for variance accounted for in all endogenous variables combined is 31.9%. The likelihood ratio (LR) Chi-square test (df=52)=2876.72 ($p<0.001$). The RMSEA, CFI and TLI estimates indicate an acceptable model fit.[19]

[19] The TLI is a little below the conventional cut-off of 0.90. However, inspection of residuals for different parts of the model indicated that all parts fitted the data reasonably satisfactorily.

The most interesting results here show the impact of altruistic values on behavioural choices and domain satisfactions. Every one-point difference in altruism (measured on a 1-4 scale) is associated with 0.36 points ($p<0.001$) difference in volunteering (measured on a 1-5 scale). There are also quite strong links between altruism and frequency of attendance at community events ($b=0.17$ $p<0.001$), and regularly meeting and supporting friends, relatives and neighbours ($b=0.16$ $p<0.001$).

In assessing the impact of altruistic values on satisfaction gained from voluntary work and from one's social life, we need to take account of both *direct effects* and *total effects*. Total effects are perhaps of greatest interest. Technically, total effects = direct effects + the sum of indirect effects (StataCorp., 2017). The Stata SEM software usefully prints out all these effects. The direct effect of altruistic values on satisfaction with volunteering is quite large ($b=3.46$ $p<0.001$) and the total effect (which includes indirect effects via behavioural choices) is larger still ($b=7.14$ $p<0.001$). Similarly, the direct effect of altruistic values on satisfaction with social life is substantial ($b=1.96$ $p<0.001$), with the total effect more again ($b=2.99$ $p<0.001$).

Behavioural choices linked to altruism also have significant effects on satisfaction with volunteering and with one's social life. The direct link between frequency of volunteering and satisfaction with volunteering is very strong ($b=8.40$ $p<0.001$). The link between frequency of meeting/helping friends, relatives or neighbours and satisfaction with one's social life is also substantial ($b=5.85$ $p<0.001$).

Two of the personality traits measured in SOEP – openness to experience ($b=0.07$ $p<0.001$), and agreeableness ($b=0.05$ $p<0.001$) – predispose people towards prioritising altruistic values. Women tend to subscribe to altruistic values more strongly than men.

Partners' values matter too

We mentioned in the introduction that partners tend to share similar values and that, if they do, they can benefit each other in terms of domain satisfactions and LS. The previous model (Table 1) related to all panel members. We also ran a model just for partnered people… with

some striking results.[20] First, note that the bivariate Spearman correlation (rho) between the altruism ratings of partners is 0.32. It then transpires that partner's altruism significantly reinforces an individual's own frequency of undertaking voluntary work and meeting/helping friends, relatives or neighbours. Similarly, satisfaction with volunteering activities and with one's social life are enhanced if partner too prioritises altruistic values.

Family values recipes

The core of the family values 'recipe', which is endorsed more by women than men, is having more children than most other people, spending more time on child care, also on home repairs and yard work, and more time than average with family and relatives. Family values, together with these choices and activities, yield above average satisfaction with family life.

The family values model is a very good fit to the input data. The RMSEA is 0.01, the CFI is 1.00 and the TLI is 0.98. The coefficient of determination (variance accounted for in all endogenous variables) is 60.2%. The LR Chi-square test (df=26) =387.52 ($p<0.001$).

Rather than present a full set of estimation results as in Table 1, we just summarise results of main interest from the family values model.

INSERT TABLE 2 HERE

People who subscribe strongly to family values are more likely to have children in the first place, and the stronger their commitment to these values, the more children they have ($b=0.29$ $p<0.001$). Women (but not men) with strong family values also spend more time than most other people on child care, even controlling for the number of children they have. Family values are linked to spending more time than average in the company of family and relatives, and with much above average satisfaction with family life. The direct effect of family values on family satisfaction is substantial ($b=3.69$ $p<0.001$), with total effects (including indirect effects via behavioural choices) being 4.04 ($p<0.001$). Women adhere somewhat more strongly to family values than men, and partnered/married people are more family-oriented than people who are single or not currently married. People on higher

[20] This simply involved inserting partners' altruistic values on the RHS of equations that were otherwise the same as reported in Table 1.

incomes and foreigners living in Germany (compared with Germans) are also relatively family-oriented.

Unemployed people, who tend to have time on their hands, spend more hours than most other people on child care, household repairs and yard work. They also have more children than average, as do foreigners living in Germany. Women of course spend more time on child care and most other household tasks than men, but following the traditional role division, men do most of the repairs and yard work. However, net of other variables, women with high family incomes spend less time on child care than most other women.

Most results relating to family values are much the same for men as for women. Like their partners, men who subscribe to family values have more children than less family-oriented men, and they spend more time on repairs and yard work. They report well above average levels of satisfaction with family life ($b=5.04$ $p<0.001$).

Unlike currently partnered/married women, and perhaps due to bitter experience, single mothers are less family-oriented than average. However, those who subscribe strongly to family values do spend more time than other single mothers with family and relatives, and also more time on child care, repairs and yard work. They are much less satisfied than most other people with family life.

The effects of *partner's family values* on one's own behavioural choices and satisfactions are substantial. First, note that the bivariate correlation between partners' family values is high; Spearman's rho=0.55. Then, over and above the effects of one's own family values, partners' family values affect the number of children born to the family ($b=0.33$ $p<0.001$). They also have an effect on time spent on child care ($b=0.58$ $p<0.001$), an effect on satisfaction with family life of 1.84 ($p<0.001$), and an effect on LS of 0.70 ($p<0.001$).

Materialistic values recipe

The core of the materialistic 'recipe' is aiming to be successful in financial and career terms. People who subscribe to this recipe work long hours and make good money, but they feel overworked, and while they have about average job satisfaction, they remain dissatisfied with their incomes.

Table 3 gives results of main interest (rather than full model estimates). The model fits the data very satisfactorily. The RMSEA is 0.03, the CFI is 0.98 and the TLI is 0.89. The coefficient of determination, summarising the variance accounted for in all endogenous variables, is 39.8%. The LR Chi-square test (df=17) = 2101.23 ($p<0.001$).

INSERT TABLE 3 HERE

The focus here is on careers and earnings, so only individuals in employment are included in the analyses reported in Table 3. More men than women subscribe to materialistic values, and nearly all the men in this prime age group (25-54) are in employment. Women with strong materialistic values are mostly in paid employment, while women who rate lower on materialistic values are somewhat more likely to be homemakers.

A key point is that materialistic people follow through on their values by working considerably longer hours than average ($b=0.38$ $p<0.001$), and by earning more than most other people ($b=1.06$ $p<0.001$). However, their high earnings are only due to working long hours; their hourly rate of pay is just average. On balance, people with materialistic values have about average job satisfaction, with their satisfaction being reduced by working long hours ($b= -1.58$ $p<0.001$). The women, in particular, feel overworked. Despite their strenuous efforts, and their objectively high earnings, people with materialistic values are seriously dissatisfied with their family incomes. The direct effect of materialistic values on satisfaction with income is ($b= -2.21$ $p<0.001$), with the total effect being somewhat less negative ($b= -1.35$ $p<0.001$) due to above average earnings.

Materialistic values are linked to the personality trait of conscientiousness ($b=0.09$ $p<0.001$). Conscientiousness, and also rating low on the neuroticism, are strongly linked to higher earnings and to above average job satisfaction and family income satisfaction (see also Duckworth, Weir, Tsukuyama and Kwok, 2012).

The evidence suggests that being materialistic, and spending long hours working, has knock-on effects in reduced time spent on family matters and caring activities. Materialistic people actually have fewer children than people who prioritise family, altruistic or religious values.

They also spend less time than people who prioritise other values on child care and housework. Individuals with materialistic values tend to have partners with similar values (Spearman’s rho=0.26).

Religious values recipe

The religious values 'recipe' is not as distinct from other recipes as the previous ones. It can be thought of as a combination of the family values and altruistic values recipes, with religious belief added. In line with their values, religious people attend religious services and events (churches, mosques, synagogues) much more than others. Their behavioural choices include having more children than average (although not as many as those who espouse family values without the religious add-on) and spending a lot of time with family and relatives. They immerse themselves in family and home-based activities. Their altruistic side comes out in a high level of volunteering. They report a high degree of satisfaction with family life.

The religious values model is a good fit to the data with a RMSEA of 0.02, a CFI of 0.98, a TLI of 0.94 and a coefficient of determination of 38.0%. The LR Chi-square test (df=59) = 1655.33 ($p<0.001$).

Table 4 gives results of main interest, rather than complete model estimates.

INSERT TABLE 4 HERE

The population groups in Germany who espouse religious values are quite sharply defined. More women than men are religious. Partly as a legacy of communist times, East Germans are much less religious than West Germans ($b= -0.55$ $p<0.001$). Immigrants/foreigners are more religious than either group of Germans ($b=0.40$ $p<0.001$). Single and separated/divorced individuals subscribe to religious values less than married/partnered couples.

Religious values are linked to the behavioural choices of regular church attendance ($b=0.47$ $p<0.001$) and to volunteering ($b=0.14$ $p<0.001$), presumably in many cases through religious charities. In this respect, people who espouse religious values overlap with the group holding altruistic values. They also overlap with the group holding family values in that they meet more frequently than most other people with family members and relatives. They provide more care for other adults (e.g. elderly relatives) than other groups.

As mentioned, there is no questionnaire item in SOEP which directly taps into the domains in which religious people might be expected to be more satisfied than others. There is, for example, no item about satisfaction with 'your religion' or 'your spiritual life'. However, religious people report above average satisfaction with family life (though not rating as highly as those who prioritise family values). They undertake a great deal of voluntary work, but derive less satisfaction from it than volunteers with more secular values.

People who themselves subscribe to religious values generally have partners/spouses who follow the same beliefs and practices. The bivariate correlation between the religious values of partners is 0.56, and the correlation for church (mosque, synagogue) attendance is 0.67. Model estimations in which partner's religious values are also included indicate that, over and above one's own values, partner's religious values influence one's own propensity to undertake voluntary work, and also influence (add to) satisfaction with family life.

What works? Recipes that succeed - and recipes that fail - in promoting LS

The aim here is to assess which 'recipes' effectively promote LS, and which fail to do so. The outcome variables used in making this assessment are individual LS Grand Means and individual LS Grand Standard Deviations for the decade 2007-16. Grand Means are measures of long term well-being, while Grand Standard Deviations measure long term volatility. The explanatory variables are the four values, plus socio-economic variables and personality traits, which are just included as 'controls'.

The results in Table 5 show the effect of each set of values on LS, net of other values.

INSERT TABLE 5 HERE

The evidence unambiguously indicates that non zero sum priorities - altruistic values, family values and religious values - all have positive effects in promoting long term LS. Equally clearly, materialistic values are detrimental to long term LS. The evidence in relation to volatility is also consistent. Materialistic values are associated with high degrees of volatility, perhaps because pursuing zero sum goals is almost bound to lead to failures as well as successes. Altruistic values and family values, on the other hand, are associated with relatively low degrees of volatility. Perhaps surprisingly, there appears to be no link between religious values and volatility; it might have been expected that people with strong religious convictions would experience low levels of LS volatility.

Partner's values also influence an individual's long term LS. We re-ran the analyses in Table 5 with partner values added. It appears that, when it comes to altruistic values, both self and partner values have about the same influence on an individual's LS Grand Mean; coincidentally both coefficients are 1.31 ($p<0.001$). Partner family values also have a positive effect on a person's own Grand Mean ($b=0.57$ $p<0.001$), as do partner religious values ($b=0.63$ $p<0.001$). Partner materialistic values have a negative effect ($b= -0.62$ $p<0.001$), reinforcing the negative effect of a person's own materialistic values.

Partner values also have some influence on an individual's LS volatility. Partner family values somewhat reduce volatility ($b= -0.27^{**}$ $p<0.01$), while partner material values somewhat increase it ($b=0.23$ $p<0.01$). The effects of partner altruistic values and partner religious values are not statistically significant.

What happens if values change?

Most people's values are fairly stable, as the evidence reviewed in the Methods section shows. However, people do sometimes change their values, and if they do so, it is usually a slow process. To investigate whether changes in values are linked to changes in LS, we estimate a fixed effects (within-person) generalised least squares (GLS) longitudinal regression equation. Rather than restrict analysis to the 2007-16 period covered in the rest of

the paper, we allow for slow changes in values by using the full span of years, 1990-2016, in which measures of values have been included in SOEP.

In the fixed effects equation, the dependent variables are annual measures of LS (1990-2016), and the explanatory variables of main interest are the four sets of values (socio-economic variables are just included as 'controls').[21] It transpires that changes in altruistic values ($b=1.43$ $p<0.001$), in family values ($b=0.46$ $p<0.001$) and also in religious values ($b=0.22$ $p<0.01$) are positively linked to changes in LS, which is line with expectations. However, changes in materialistic values ($b= -0.03^{ns}$) are not significantly related to LS change.

'Nothing Valued': a non-recipe

Some SOEP panel members rated all values – or at least all values listed in the questionnaire – as relatively unimportant. Having no values/priorities is, in a sense, a non-recipe for living. It is clear that individuals who fit into what might be called the 'Nothing Valued' category have low long term LS; lower than all other values-defined groups (Andrews and Withey, 1976; Emmons, 1986). They also record a high degree of LS volatility.

'Nothing Valued' was measured by simply adding, and then inverting, respondents' ratings on the four values combined, so that a high aggregate score meant 'Nothing Valued', and a low score reflected a tendency to rate all or most values highly. The Spearman rho (rank order correlation) between 'Nothing Valued' and the Grand Mean of LS is – 0.22 ($p<0.001$). The correlation (rho) of 'Nothing Valued' with the Grand Standard Deviation is 0.09 ($p<0.001$). Finally, we re-ran the equations in Table 5 with 'Nothing Valued' added, confirming that an absence of life priorities is negatively related to the Grand Mean of LS, and is also linked to a fairly high degree of volatility.

Confirmatory evidence that the recipes are distinct

Colleagues who read a draft of the paper raised issues about the distinctiveness of the four main recipes. Are they distinct or do they overlap to a considerable degree? Clearly, the distinctiveness of the values themselves (i.e. the survey items measuring them) is confirmed by the replicating factor analyses described earlier.

[21] Gender and personality traits are not included because they are 'fixed' effects.

So the ‘distinctiveness’ issue boils down to whether the behavioural choices and domain satisfactions, that we have modelled as being part of four value ‘sets’, co-vary significantly more strongly with the ‘values/life priorities’ to which they have been assigned than to alternative values. This is clearly the case with all the behavioural choices in our models. All of the behaviours shown as related to altruistic values co-vary (positively) with these values much more strongly ($p<0.001$) than they do with family values, materialistic values or religious values. Similarly, the behaviours linked to family, materialistic or religious values co-vary (positively) much more strongly with the values to which they are assigned than to other values.

The story is more complicated when it comes to domain satisfactions. In the case of the ‘successful’, non zero sum recipes, domain satisfactions are strongly linked to the values/life priorities to which they have been assigned. However, materialistic values are not a recipe for high LS, and they do not result in high levels of satisfaction in the domains to which materialists give priority. Job satisfaction is only about average and satisfaction with family income is well below average.

It is also interesting that people who prioritise non-zero sum values have above average levels of satisfaction in all ‘social’ or ‘pro-social’ domains. That is, they are relatively satisfied with their family lives, their social lives and (if they do any) with volunteering. On the other side, people who prioritise materialistic values are, on average, much less satisfied in all these domains.

Do values predict future behaviours? As a rather speculative exercise, we made a few long-term predictions - 10-year predictions - about links between values and selected behavioural choices that can be easily and unambiguously measured. A straightforward regression equation showed that the more strongly individuals subscribe to family values at time t, the more children they will have ten years later, controlling for number of children at time t. A similar equation showed that people who subscribe strongly to materialistic values at time t, will work longer hours ten years down the track than people who rate low on materialistic values, controlling for working hours at time t. Similarly, materialistic values predict higher earnings in ten years time, net of earnings at time t.

Discussion

The main purpose of this paper has been to suggest that there are alternative values-based 'recipes' for LS. The implicit claim in most previous LS research that 'one size fits all' is certainly unproven and probably incorrect. A second important summary point is that some 'recipes' are more successful than others in promoting high levels of LS. People with altruistic values, or family values, or religious values have above average levels of LS. People with materialistic values have somewhat below average LS, and people who rate all (listed) values as relatively unimportant record the lowest LS.

Recognising that 'one size does *not* fit all' opens the way for continued research on alternative approaches to LS. The SOEP data limit the range of values-based recipes that can currently be investigated in the German context, but it seems very likely that in other countries and other times many other approaches to LS have been attempted. Our hope is that it will prove possible, in future research, to identify these approaches and assess their efficacy in promoting LS.

Our claim that there are alternative recipes for LS does not preclude the possibility that there are some aspects of living that everyone must get 'right' in order to be happy. Possible candidates might be a close, intimate relationship with at least one other person, good family relationships, a supportive social network, reasonably good health, and an adequate basic income. We have not addressed these possibilities in the paper, and we point out that nor have researchers who have implicitly claimed that 'one size fits all'. Existing research has provided many insights into the covariates of LS, but so far as we are aware, there has been no empirical demonstration – nor even an attempt to demonstrate – that people cannot be happy unless certain essentials are fulfilled.

No suggestion that changing values is easy: positive feedback loops

It might seem that our results imply that individuals could increase their LS by changing their values. As we have seen, some people do change their values, but the process is usually slow, and even with strong motivation there are likely to be setbacks. Human beings are to some extent feedback machines, running on positive and negative feedback loops; experiencing reinforcement and aversion. In practice, any serious attempt a person made to change his/her

values could only be successful if the behavioural choices that flowed from the changes resulted in positive feedback; that is, in positive emotions (pleasure, satisfaction) in the domain or domains of life in which improvement was attempted (Fredrickson and Losada, 2005; Wilson and Gilbert, 2008; Fredrickson, 2009). Only if positive feedback loops ('virtuous cycles') are created is lasting change likely to occur.

Adaptation

Successful change would also involve resisting and limiting the effects of adaptation. As well as being feedback machines, humans could also be described, in part, as adaptation machines. People adapt (habituate) to changes in their emotional life, just as they adapt to changes in the physical environment (Helson, 1964). Positive emotions that may arise from value-driven changes in behaviour are unavoidably subject to some degree of adaptation/habituation. Consequently, positive feedback (reinforcement) tends to wear off. This issue has been addressed in research by positive psychologists, who have proposed a variety of mechanisms (e.g. 'attend' 'savour', 'count blessings') by which individuals attempting positive change may attempt to reduce the effects of adaptation (Lyubomirsky, 2007; Wilson and Gilbert, 2008; Fredrickson, 2009; Seligman, 2011).

Future research: two-way causation?

Discussion of feedback loops between values, behavioural choices and emotions implies two-way causation. In this paper, partly for reasons of mathematical tractability, we have modelled these linkages as if only one-way causation applied. However, in previous papers we have estimated two-way causation models linking changes in behavioural choices with changes in domain satisfactions (Headey and Muffels, 2015, 2017). Including values in this framework as well will require long term data, because values change slowly. Fortunately, SOEP continues to collect data covering all required variables, so two-way models are a realistic possibility in future work.

References

Aguche, A. and Trommsdorff, G. (2010) Transmission of well-being between mothers, fathers and adolescent children: the role of parenting and personality factors, *9th International German Socio-Economic Panel Users Conference,* June 30-July 1.

Ajzen, I., and Fishbein, M. (1980) *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ, Prentice-Hall.

Andrews, F.M. and Withey, S.B. (1976) *Social Indicators of Well-Being*. New York, Plenum.

Argyle, M. (2001) *The Psychology of Happiness.* New York, Routledge.

Argyle, M. (2002) Obituary, *Daily Telegraph* (London) (September 12).

Bentler, P.M. (1990) Comparative fit indices in structural models, *Psychological Bulletin,* 107, 238-46.

Browne, M.W. and Cudeck, R. (1993) 'Alternative ways of assessing model fit' in K.A. Bollen and J.S. Long eds. *Testing Structural Equation Models.* Newbury Park, Ca., Sage.

Cantor, N., and Sanderson, C. A. (1999) 'Life task participation and well-being: The importance of taking part in daily life' in D. Kahneman, E. Diener and N. Schwarz eds., *Well-being: The Foundations of Hedonic Psychology*. Thousand Oaks, CA., Sage, pp. 230-243.

Cantril, H. (1965) *The Pattern of Human Concerns*. New Brunswick, Rutgers Univ. Press.

Costa, P.T. and McCrae, R.R. (1991) *The NEO PI-R.* Odessa, Fl., PAR.

Deaton, A. (2008) Income, health and well-being around the world: Evidence from the Gallup World Poll, *Journal of Economic Perspectives,* 22, 53-72.

Diener, E. and Fujita, F. (1995) Resources, personal strivings, and subjective well-being: A nomothetic and idiographic approach, *Journal of Personality and Social Psychology*, 68, 926-35.

Diener, E., Suh, E.M., Lucas, R.E. and Smith, H.L. (1999) Subjective well-being: Three decades of progress, *Psychological Bulletin, 25,* 276-302.

Diener, E. and Seligman, M.E.P. (2002) Very happy people, *Psychological Science*, 13, 81-84.

Diener and Seligman (2004) Beyond money: Towards an economy of well-being, *Psychological Science in the Public Interest,* 5, 1-31.

Diener, E. and Biswas-Diener, R. (2008) *Happiness: Unlocking The Mysteries Of Psychological Wealth.* Oxford, Blackwell.

Duckworth, A.L., Weir, D., Tsukayama, E. and Kwok, D. (2012) Who does well in life? Conscientious adults excel in both objective and subjective success, *Frontiers in Psychology*, 3, 356.

Dunn, E.W., Aknin, L.B. and Norton, M.I. (2008) Spending money on others promotes happiness, *Science*, 319, 1687-88.

Fishbein, M. and Ajzen, I. (1974) Attitudes towards objects as predictors of single and multiple behavioral criteria, *Psychological Review*, 81, 59–74.

Emmons, R.A. (1986) Personal strivings: An approach to personality and subjective well-being, *Journal of Personality and Social Psychology*, 51,1058–68.

Emmons, R. A., and King, L. A. (1988) Conflict among personal strivings: Immediate and long-term implications for psychological and physical well-being, *Journal of Personality and Social Psychology*, 54, 1040-1048.

Emmons, R.A. (1992) Abstract versus concrete goals: Personal striving level,

physical illness, and psychological well-being, *Journal of Personality and Social Psychology*, 62, 292-300.

Fredrickson B. L. and Losada, M. F. (2005) Positive affect and the complex dynamics of human flourishing, *American Psychologist*, 60(7), 678–686. doi:10.1037/0003-066X.60.7.678

Fredrickson, B.L. (2009) *Positivity.* New York, Crown.

Frick, J.R., Schupp, J. and Wagner, G.G. (2007) Enhancing the power of the German Socio-Economic Panel Study (SOEP) – evolution, scope and enhancements, *Schmollers Jahrbuch,* 127, 139-69.

Frijters, P., Haisken-DeNew, J.P., and Shields, M.A. (2004) Money does matter! Evidence from increasing real income and life satisfaction in East Germany following reunification, *American Economic Review,* 94, 730-40.

Gilbert, D.T. (2006) *Stumbling on Happiness.* New York, Knopf.

Harlow, R.E. and Cantor, N. (1996) Still participating after all these years: A study of life task participation in later life, *Journal of Personality and Social Psychology,* 71, 1235-49.

Headey, B.W. (2008) Life goals matter to happiness: A revision of set-point theory, *Social Indicators Research,* 86, 213-31.

Headey, B.W., Muffels, R.J.A. and Wagner, G.G. (2010) Long-running German panel survey shows that personal and economic choices, not just genes, matter for happiness, *Proceedings of the National Academy of Sciences,* 107.42, 17922-17926 (Oct. 19).

Headey, B.W., Muffels, R.J.A. and Wagner, G.G. (2014) Parents transmit happiness along with associated values and behaviors to their children: A lifelong happiness dividend? *Social Indicators Research*, 116, 909-33.

Headey, B.W. and Muffels, R.J.A. (2015) Towards a theory of medium term Life Satisfaction: Two-way causation partly explains persistent satisfaction or dissatisfaction, *Social Indicators Research,* 124.2. Published online 14 October 2015. DOI 10.1007/s11205-015-1146-8.

Headey, B.W. and Muffels, R.J.A. (2017) A theory of Life Satisfaction dynamics: Stability, change and volatility in 25-year trajectories in Germany, *Social Indicators Research*, 1-30, Published online 24 November, 2017. ISSN 0303-8300.

Helson, H. (1964) *Adaptation-Level Theory.* New York, Harper & Row.

Huppert, F.A. and So, T.T.C. (2013) Flourishing across Europe: Application of a new conceptual framework for defining well-being, *Social Indicators Research*, 110, 837-61.

Juster, F.T., Hiromi, O. and Stafford, F.P. (2003) An assessment of alternative measures of time use, *Sociological Methodology*, 33, 19-54.

Kenny, D.A. and McCoach, D.B. (2003) Effect of the number of variables on measures of fit in structural equation modeling, *Structural Equation Modeling,* 10, 333-51.

Kluckhohn, F.R. and Strodtbeck, F.L. (1961) *Variations in Value Orientations.* Evanston, Illinois, Row, Peterson.

Lucas, R.E. (2008) 'Personality and subjective well-being' in M. Eid and R.J. Larsen eds. *The Science of Subjective Well-Being.* New York, Guilford Press, pp. 171-94.

Lykken, D. and Tellegen, A. (1996) Happiness is a stochastic phenomenon, *Psychological Science, 7,* 186-89.

Lyubomirsky, S. (2007) *The How of Happiness.* New York, Penguin.

Markowitz, H.M. (1952) Portfolio selection, *The Journal of Finance*, **7**, 77–91

Nickerson, C., Schwarz, N., Diener, E. and Kahneman, D. (2003) Zeroing in on the dark side of the American dream: A closer look at the negative consequences of the goal for financial success, *Psychological Science*, 14, 531-36.

Petersen, C. (2006) *A Primer in Positive Psychology*. New York, Oxford Univ. Press.

Richter, D., Metzing, M., Weinhardt, M., and Schupp, J. (2013) *SOEP Scales Manual*, SOEP Survey Papers, No. 138.

Rokeach, M. (1973) *The Nature of Human Values.* New York, NY, Free Press.

Satorra, A., and Bentler, P.M. (1994) 'Corrections to test statistics and standard errors in covariance structure analysis' in A. von Eye and C. C. Clogg, *Latent Variables Analysis*: *Applications for Developmental Research.* Thousand Oaks, CA., Sage, pp. 399–419.

Schäfer, K.C. (2017) An Investigation Into the Stability of the Big-Five in Germany, *SOEP Technical Report*, Berlin, DIW.

Schimmack, U. and Lucas, R.E. (2010) Environmental influences on well-being: A dyadic latent panel analysis of spousal similarity, *Social Indicators Research*, 98, 1-21.

Seligman, M.E.P. (2011) *Flourishing.* New York, Free Press.

Stata Corporation (2017) Stata: Structural Equation Reference Manual, Release 15. College Station, Texas.

Thoits, P.A. and Hewitt, L.N. (2001) Volunteer work and well-being, *Journal of Health and Social Behavior*, 42, 115-31.

United Nations (2012-17) *World Happiness Reports.* New York, United Nations Sustainable Development Solutions Network.

United Nations (2016) *World Happiness Report* eds. J. Helliwell, H. Huang and S. Wang. New York, United Nations Sustainable Development Solutions Network.

Vaillant, G. (2015) *Triumphs of Experience.* Cambridge, Harvard Univ. Press.

Wilson, T.D. and Gilbert, D.T. (2008) Explaining away: A model of affective adaptation, *Perspectives on Psychological Science,* 3, 370-86.

Winkelmann, R. (2004) Subjective well-being and the family: Results from an ordered probit model with multiple random effects, IZA Discussion Paper No. 1016.

Appendix
Additional model estimates

Our main results are given in Tables 1-4. These tables only include model estimates of theoretical and substantive interest, all of which relate to paths linking exogenous variables to endogenous variables, or linking endogenous variables to each other. However, structural equation models always include additional paths that are essential to achieve satisfactory model fit. Our models all include 'curved arrows', indicating covariances between pairs of exogenous variables, and also 'curved arrows' indicating covariances between the error terms of pairs of endogenous variables.

An example: our first structural equation model, which is focussed on altruistic values (main results in Table 1), includes covariances among all sixteen exogenous variables (gender, age, …personality traits etc) in the model. Stata's SEM software, in fact, estimates covariances among exogenous variables by default. In addition to these covariances, we stipulated that the model should also include estimates of the covariances between the error terms of the three behavioural choices (frequency of voluntary work, attending community events, and frequency of meeting/helping friends, relatives or neighbours), and the covariance between the error terms of the two domain satisfactions (satisfaction with voluntary work and satisfaction with one's social life). The inclusion of these covariances does not substantially affect the parameter estimates of substantive interest.

Table 1

The Altruistic 'Recipe':

A Longitudinal 4-Step Structural Equation Model (N=74026)

Panel 1: Effects on **values** of socio-economic variables and personality traits

Explanatory variables	*Values:* **Altruistic values**	*Explanatory variables*	*Values* **Altruistic values**
Socio-economic variables (lagged)		*Personality traits (lagged)*	
Female	0.04***	Extroversion	0.02***
Age	-0.00***	Openness	0.07***
Years of education	0.03***	Agreeableness	0.05***
HH net income	0.03***	Risk willingness	0.01***
East German	-0.06***		

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 2: Effects on **behavioural choices** of socio-economic variables, traits and values

Explanatory variables	*Behavioural choice* Voluntary work	*Behavioural choice* Attend community events	*Behavioural choice* Meet/help friends, relatives or neighbours
Socio-economic variables (lagged)			
Female	-0.08***	-0.06***	ns
Age	0.01***	ns	-0.01***
Years of education	0.01***	ns	ns
HH net income (ln)	0.09***	-0.01***	ns
East German	-0.14***	ns	-0.14***
Foreign	-0.25***	ns	ns
Personality traits (lagged)			
Neuroticism	-0.03***	ns	-0.04***
Extroversion	ns	ns	0.03***
Openness	ns	ns	ns
Agreeableness	-0.03***	ns	ns
Conscientiousness	-0.03***	0.03***	-0.03***
Values (lagged)			
Altruistic values	**0.36*** **	**0.17*** **	**0.16*** **

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 3: Effects on **domain satisfactions** of socio-economic variables, traits, values and behavioural choices

Explanatory variables	*Domain satisfaction* Volunteering	*Domain satisfaction* Social life
Socio-economic variables (lagged)		
Age	ns	-0.13***
Years of education	0.41***	ns
HH net income (ln)	3.11***	2.58***
Unemployed	-3.69***	ns
East German	-3.22***	-0.62***
Foreign	-3.53***	ns
Personality traits (lagged)		
Neuroticism	-0.84***	-1.58***
Extroversion	ns	1.68***
Agreeableness	1.60***	1.59***
Conscientiousness	0.93***	1.54***
Values (lagged)		
Altruistic values	**3.46*** **	**1.96*** **
Behavioural choices (lagged)		
Voluntary work	8.40***	ns
Meet/help friends, relatives	3.86***	5.85***
Attend community events	ns	0.52***

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 4: Effects on **LS** of socio-economic variables, traits, values, behavioural choices and domain satisfactions

Explanatory variables	*Life Satisfaction (LS)*	*Explanatory variables*	*Life Satisfaction (LS)*
Socio-economic variables (lagged)		*Behavioural choices (lagged)*	
Female	1.16***	Voluntary work	ns
Age	-0.20***	Meet/help friends, relatives, neighbours	ns
Years of education	0.35***	*Domain satisfactions (lagged)*	
HH net income (ln)	2.87***	Volunteering: satisfaction	0.09***
Unemployed	-4.24***	Social life: satisfaction	0.25***
Disability	-4.70***		
East German	-1.54***		
Personality traits (lagged)			
Neuroticism	-2.01***		
Extroversion	ns		
Openness	0.18***		
Agreeableness	0.35***		
Conscientiousness	0.22**		
Risk willingness	0.25***		
Values (lagged)			
Altruistic values	**1.18*** **		

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Table 2

The Family Values 'Recipe':

A Longitudinal 4-Step Structural Equation Model (N=122208)

Panel 1: Effects on **values** of socio-economic variables and personality traits

Explanatory variables	*Values:* **Family Values**	*Explanatory variables*	*Values:* **Family values**
Socio-economic variables (lagged)		*Personality traits (lagged)*	
Female	0.01***	Neuroticism	0.02***
Age	0.01***	Extroversion	0.03***
Partnered	0.49***	Agreeableness	0.04***
HH net income (ln)	0.10***	Conscientiousness	0.05***
Unemployed	-0.06***		
Disability	-0.15***		
Foreign	0.07***		
East German	0.03***		

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 2: Effects on **behavioural choices** of socio-economic variables, traits and values

Explanatory variables	*Behavioural choice* Number of children (ln)	*Behavioural choice* Hours per week on childcare (ln)	*Behavioural choice* Hours per week on home repairs/yard (ln)	*Behavioural choice* Time with family, relatives
Socio-economic variables (lagged)				
Female	0.11***	0.48***	-0.11***	0.09***
Age	0.01***	-0.02***	0.04***	-0.01***
Partnered	0.30***	0.50***	0.06***	0.05***
Years of education	-0.01***	ns	-0.02***	-0.03***
HH net income (ln)	-0.01***	-0.07***	0.01***	-0.04***
Unemployed	0.10***	0.19***	0.04***	ns
Disability	-0.12***	ns	ns	ns
East German	0.09***	ns	0.07***	-0.04***
Foreign	0.14***	ns	-0.09***	ns
Personality traits (lagged)				
Neuroticism	ns	ns	ns	-0.02***
Extroversion	0.01***	-0.01***	ns	0.04***
Openness	-0.02***	ns	-0.01**	ns
Agreeableness	0.01***	ns	-0.02***	0.03***
Conscientiousness	-0.01***	ns	0.02***	0.01**
Risk willingness	0.00***	ns	ns	ns
Values (lagged)				
Family values	**0.29*** **	**0.30*** **	**0.10*** **	**0.21*** **

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 3: Effects on **domain satisfactions** of socio-economic variables, traits, values and behavioural choices

Explanatory variables	*Domain satisfaction* Family life	*Explanatory variables*	*Domain satisfaction* Family life
Socio-economic variables (lagged)		*Personality traits (lagged)*	
Age	-0.21***	Neuroticism	-1.52***
Partnered	3.75***	Extroversion	0.63***
HH net income (ln)	2.24***	Openness	0.16*
Unemployed	-1.43***	Agreeableness	1.54***
Disability	-1.31***	Conscientiousness	1.26***
East German	-0.89***	***Values (lagged)***	
		Family values	3.69***
		Behavioural choices (lagged)	
		Time with family, relatives	1.73***

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 4: Effects on **LS** of socio-economic variables, traits, values, behavioural choices and domain satisfactions

Explanatory variables	*Life Satisfaction (LS)*	*Explanatory variables*	*Life Satisfaction (LS)*
Socio-economic variables (lagged)		*Personality traits (lagged)*	
Female	1.40***	Neuroticism	-2.09***
Age	-0.20***	Extroversion	0.27***
Partnered	-0.29***	Openness	0.40***
Years of education	0.67***	Agreeableness	0.31***
HH net income (ln)	2.07***	Conscientiousness	0.15*
Unemployed	-4.88***	Risk willingness	0.31***
Disability	-5.50***	***Values (lagged)***	
East German	-2.11***	**Family values**	**0.57*** **
		Behavioural choices (lagged)	
		Number of children	1.12***
		Time with family, relatives	0.67***
		Domain satisfaction (lagged)	
		Family life	0.30***

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Table 3

The Materialistic Values 'Recipe'

A Longitudinal 4-Step Structural Equation Model (N=122209)

Panel 1: Effects on **values** of socio-economic variables and personality traits

Explanatory variables	*Values:* **Materialistic Values**	*Explanatory variables*	*Values:* **Materialistic Values**
Socio-economic variables (lagged)		*Personality traits (lagged)*	
Female	-0.14***	Neuroticism	0.01***
Age	-0.03***	Extroversion	0.05***
Age-squared	0.03***	Openness	0.02***
East German	0.06***	Agreeableness	-0.02***
Foreign	0.04***	Conscientiousness	0.09***
		Risk willingness	0.01***

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 2: Effects on **behavioural choices** of socio-economic variables, traits and values

Explanatory variables	*Behavioural choice* Annual working hours (ln)	*Behavioural choice* Individual labour earnings (ln)
Socio-economic variables (lagged)		
Female	-0.59***	-1.34***
Age	0.14***	0.38***
Age-squared/10	-0.16***	-0.43***
Partnered	-0.17***	ns
Years of education	0.07***	0.27***
East German	0.10***	-0.26***
Foreign	ns	-0.27***
Personality traits		
Neuroticism	-0.07***	-0.23***
Openness	ns	-0.02*
Agreeableness	-0.07***	-0.22***
Conscientiousness	0.11***	0.27***
Risk willingness	0.01***	0.03***
Values (lagged)		
Materialistic values	**0.39*** **	**1.09*** **

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 3: Effects on **domain satisfactions** of socio-economic variables, traits, values and behavioural choices

Explanatory variables	*Domain satisfaction* Job	*Domain satisfaction* Household income
Socio-economic variables (lagged)		
Age	-0.24***	-0.81***
Partnered	2.49***	5.10***
Years of education	0.50***	1.48***
East German	-2.12***	-5.82***
Foreign	ns	-2.94***
Personality traits		
Neuroticism	-3.20***	-2.48***
Extroversion	0.85***	0.58***
Openness	0.40***	0.45***
Agreeableness	1.05***	ns
Conscientiousness	1.29***	1.02***
Risk willingness	0.14***	ns
Values (lagged)		
Materialistic values	**0.70 [a]*** **	**-2.47*** **
Behavioural choices (lagged)		
Annual working hours (ln)	-1.42***	-1.44***
Earnings (ln)	0.82***	1.37***

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

a. This coefficient is *not* higher than for individuals who prioritise other values.

Panel 4: Effects on **LS** of socio-economic variables, traits, values, behavioural choices and domain satisfactions

Explanatory variables	*Life Satisfaction (LS)*	*Explanatory variables*	*Life Satisfaction (LS)*
Socio-economic variables (lagged)		*Behavioural choices (lagged)*	
Female	1.35***	Annual working hours (ln)	-0.43***
Age	-0.23***	Earnings (ln)	0.27***
Partnered	2.01***	*Domain satisfactions*	
Years of education	0.32***	Job	0.17***
Disability	-4.58***	Household income	0.21***
East German	-1.38***		
Personality traits (lagged)			
Neuroticism	-1.86***		
Extroversion	0.63***		
Openness	0.42***		
Agreeableness	0.58***		
Conscientiousness	0.30***		
Risk willingness	0.28***		
Values (lagged)			
Materialistic values	**-0.80*** **		

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Table 4

The Religious Values 'Recipe'

A Longitudinal 4-Step Structural Equation Model (N=123938)

Panel 1: Effects on **values** of socio-economic variables and personality traits

Explanatory variables	*Values:* **Religious values**	*Explanatory variables*	*Values:* **Religious Values**
Socio-economic variables (lagged)		*Personality traits (lagged)*	
Female	0.11***	Neuroticism	0.04***
Partnered	0.20***	Openness	0.06***
Years of education	-0.01***	Agreeableness	0.07***
East German	-0.55***	Conscientiousness	0.02***
Foreign	0.39***		

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 2: Effects on **behavioural choices** of socio-economic variables, traits and values

Explanatory variables	*Behavioural choice* Church attendance	*Behavioural choice* Voluntary work	*Behavioural choice* Time with family, relatives	*Behavioural choice* Hours per week provides care
Socio-economic variables (lagged)				
Female	ns	-0.08***	0.07***	0.02***
Age	ns	0.00***	-0.01***	ns
Partnered	0.16***	ns	0.14***	ns
Years of education	0.02***	0.03***	-0.03***	ns
Household income (ln)	0.08***	0.10***	-0.02*	ns
Unemployed	-0.08***	ns	-0.08***	ns
East German	-0.12***	-0.11***	ns	ns
Foreign	ns	-0.35***	ns	ns
Personality traits (lagged)				
Neuroticism	ns	-0.03***	ns	ns
Extroversion	-0.02***	0.02***	0.06***	ns
Agreeableness	0.02***	-0.02***	0.05***	ns
Conscientiousness	ns	-0.04***	ns	ns
Risk willingness	-0.01***	ns	-0.00*	ns
Values (lagged)				
Religious values	**0.47*** **	**0.14*** **	**0.07*** **	**0.01*** **

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 3: Effects on **domain satisfactions** of socio-economic variables, traits, values and behavioural choices

Explanatory variables	*Domain satisfaction* Family	*Domain satisfaction* Volunteering
Socio-economic variables (lagged)		
Age	-0.23***	ns
Partnered	5.13***	ns
Years of education	ns	0.57***
Household income (ln)	2.64***	2.48***
Unemployed	-1.69***	-4.38***
Disability	-1.71***	ns
East German	-0.48***	-4.49***
Foreign	ns	-5.59***
Personality traits (lagged)		
Neuroticism	-1.50***	-1.13***
Extroversion	0.71***	ns
	ns	0.44*
Agreeableness	1.62***	1.84***
Conscientiousness	1.41***	0.75***
Values (lagged)		
Religious values	**0.69*** **	**1.15*** **
Behavioural choices (lagged)		
Voluntary work	ns	9.45***
Time with family, relatives	1.94***	ns

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Panel 4: Effects on **LS** of socio-economic variables, traits, values, behavioural choices and domain satisfactions

Explanatory variables	*Life Satisfaction (LS)*	*Explanatory variables*	*Life Satisfaction (LS)*
Socio-economic variables (lagged)		***Values (lagged)***	
Female	1.50***	**Religious values**	**1.23*** **
Age	-0.21***	*Behavioural choices (lagged)*	
Partnered	0.34**	Hours per week, providing care	-1.94***
Years of education	0.59***	*Domain satisfactions (lagged)*	
Household income	1.88***	Family life	0.28***
Unemployed	-4.53***	Volunteering	0.07***
Disability	-5.77***		
East German	-1.06***		
Personality traits (lagged)			
Neuroticism	-2.03***		
Extroversion	0.40***		
Openness	0.21***		
Agreeableness	0.25***		
Conscientiousness	0.20**		
Risk willingness	0.32***		

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

Table 5

Recipes that succeed – and recipes that fail – in promoting Life Satisfaction:

Structural equation models (N=123981)[a]

Values	*LS Grand Mean (0-100)*	*LS Grand Standard Deviation (0-100)*
Altruistic values	1.68***	-0.37***
Family values	1.56***	-0.19**
Materialistic values	-1.27***	0.30***
Religious values	1.07***	-0.01[ns]
Coefficient of determination	*26.8%*	*9.8%*

*** significant at 0.001 **significant at 0.01 *significant at 0.05 ns=not significant

a. Socio-economic variables and the Big Five personality traits are included in both equations as 'controls'.