Subjective well-being and consumption:
defining the relationship and exploring the effects of overconsumption

by

Rebecca Jane Blevins

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Advisors: Petr Mariel, Iñaki Arto (BC3)

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Abstract

Previous economic studies on subjective well-being have primarily focused on income, and limited research has been conducted on the relationship between consumption and subjective well-being, which lies at the core of economic theory. This paper explores the effect of consumption on life satisfaction, using a new synthetic dataset with information on subjective well-being and consumption for Spanish households. The relationship between consumption and life satisfaction, and levels of consumption are analyzed with multiple linear regressions, while a semiparametric approach is applied through a generalized additive model (GAM). The instrumental variable approach does not confirm the presence of endogeneity, however the similarity of results from multiple approaches (GAM and linear regressions) may indicate a low severity of the issue of endogeneity in this model. This paper finds a concave curve defining the relationship between consumption and life satisfaction in both the linear regressions and the semi-parametric approach, representing a decreasing marginal effect of consumption.

Key words: subjective well-being, consumption, generalized additive model

1. Introduction

1.1 Defining Subjective Well-Being

The two main measures for subjective well-being (SWB), following Kahneman & Deaton (2010) are 1) life evaluation, representing a person's thoughts about their own life, and 2) affective measures of well-being, representing short-term emotional states. Life evaluation measures ask respondents to make a reflective judgment about their life, while affective measures aim to assess the current (or recent) emotional state of the respondent. Emotional well-being measures usually include a variety of questions on the respondent's affect, and ask how often the respondent has felt happy, sad, or stressed in a recent period of time, while life evaluation measures rely on a broader time horizon encompassing the individual's entire life. An example of life evaluation is Cantril's Self-Anchoring Scale, in which the respondent is asked to imagine a ladder and rate their current life on this ladder, on a scale from 0, "the worst possible life for you", to 10, "the best possible life for you", while another is life satisfaction, in which the respondent is asked to indicate their overall life satisfaction on a scale from 0 (not at all satisfied) to 10 (completely satisfied) (Kahneman & Deaton, 2010). In some research such as Tsurumi et al. (2021), eudaimonia, defined as an individual's sense of meaning of life, is included as a third category to measure SWB. However, eudaimonia has many similarities with life evaluation, since the individual is making a reflective judgment about their life as a whole, and studies have shown that life evaluation, affective measures, and eudaimonia are all positively correlated (Carver & Grimes, 2019; Delhey and Kroll, 2013). However, eudaimonic measures of life purpose may be more relevant to personal life choices than to overall life satisfaction. Following Kahneman & Deaton (2010), I will continue discussing only the main two categories of subjective well-being: life evaluation and affective measures.

Subjective well-being is by definition a subjective measure, which is influenced by a variety of factors: the respondent's mood, the order of questions in the questionnaire, the avoidance of extreme answers, and relative effects (Diener & Ryan, 2011; Tinkler & Hicks, 2011; Oguz et al., 2013). An individual's response on subjective well-being will be reflective of their relative assessment of their own life satisfaction or affect compared to those of people around them (a reference group) or compared to societal expectations. One example of this is the relative income effect, where people's income relative to their neighbors' is positively correlated with life satisfaction (Easterlin, 1995). Yet, studies have shown that life satisfaction is a reliable and valid measure of well-being (Kahneman & Deaton, 2010), and

Deaton (2016) showed the same for self-rated measures of material well-being, suggesting that the most effective way to judge material well-being may be by subjective, self-reported measures. Overall, Deaton has argued that people are the best judges of their own circumstances.

1.2 Subjective Well-Being & GDP, Income and Consumption

Many authors from different disciplines have investigated the determinants of well-being. In economics, there is long history of research on the relationship between per capita GDP and well-being, with a higher GDP per capita correlated with higher life expectancy, lower infant mortality, and lower levels of poverty (Fogel, 2004). While these findings give insights on country-level trends and may help guide macroeconomic policy, they do not answer the question of what provides well-being on an individual level. Recent research has exposed the limitations of GDP as a measure for well-being, as GDP does not account for differences in well-being within countries (Stiglitz et al., 2009). Easterlin (1974) researched differences in subjective well-being between individuals and found that, within countries, there is a strong association between income and happiness, with high-income individuals being happier on average than low-income individuals. More recently, Kahneman & Deaton (2010) found a positive relationship between life evaluation and income for individuals living in the US. Life evaluation, measured by Cantril's Self-Anchoring Scale, increased steadily with income, but a different result was found for affective measures. Emotional well-being (measured by positive affect, not feeling blue, and feeling stress free) increased with income, but only up to an annual income of about $75,000, after which emotional well-being did not improve. This indicates that there is a satiation point for income and affective measures, above which increased income does not improve emotional well-being, while the same is not true for life evaluation.

More recent research has begun exploring the relationship between subjective well-being and consumption (Carver & Grimes, 2019; Tsurumi et al., 2021; Noll & Weick, 2015; Jebb et al., 2018). The relationship between consumption and subjective well-being lies at the heart of micro- and macroeconomic theory, with consumption increasing utility through a concave utility function according to most economic models. However, this theoretical assumption has only recently been tested empirically, due to a lack of data containing information on both subjective well-being and consumption. Noll & Weick (2015) and Tsurumi et al. (2021) analyzed the effect of total monthly consumption on subjective well-being for Germany and Japan, respectively. Both found a concave shape defining the

relationship between consumption and subjective well-being, measured by life satisfaction, with the associated decreasing marginal returns. This means that for low levels of consumption, there is a high effect of consumption on life satisfaction, with reduced effects as consumption increases. Additionally, Tsurumi et al. (2021) found a satiation point, at which higher consumption did not increase emotional well-being, which was estimated at USD $2,000 of monthly expenditures.

1.3 Income vs. Consumption

Past research has used both income and consumption to measure and predict subjective well-being. In this section, I will review the theoretical and empirical arguments for which measure–income or consumption–is superior. The basis of all macroeconomic theory is that people derive utility via consumption. Income is relevant for the budget constraint, but does not directly give an individual utility according to these models. Since subjective well-being serves as a proxy for utility, we can conclude that the SWB of income is derived *via consumption*, making consumption a more direct measure in assessing subjective well-being (Carver & Grimes, 2019; Noll & Weick, 2015). An additional argument for why consumption may be a superior measure compared to income is the permanent income hypothesis. This states that current consumption is determined by expectations of future income, and not by current income (Friedman, 1957). I will argue that current consumption is therefore more reflective of subjective well-being than short-term changes in current income. As an example, imagine a person with a high-paying job taking a year off to take care of their children. This person will still have an expectation of high future income, despite a short-term decrease in their current income, and they will likely consume at a similar level compared to previous periods, living in the same house, and buying the same clothes, food, etc. This is because they will be consuming according to expectations of future income as stated in the permanent income hypothesis, not according to their current income. Their consumption therefore will be a superior measure of subjective well-being compared to their income in that period.

Additionally, previous studies have found empirical evidence for why consumption may be a superior measure compared to income in predicting subjective well-being. When comparing the use of income and consumption to model subjective well-being, Carver and Grimes (2019) showed that consumption-based measures outperform income in predicting subjective well-being. When their consumption-based measure, which includes both an objective consumption measure and subjective measures on standard of living, was included

in the regression, the effect of income on subjective well-being became insignificant. They concluded that consumption outperforms income in predicting subjective well-being, and noted that the poor relationship between income and SWB is most noticeable at the income extremes. Additionally, Brown & Gathergood (2020) found that consumption changes, not income changes, predict changes in subjective well-being. Following the cited theoretical arguments and empirical studies, this paper will use consumption as the main measure and predictor of subjective well-being.

1.4 Motivations

The motivation of this study is to further explore the relationship between subjective well-being and consumption using parametric and semiparametric approaches to define this relationship, with Tomás et al. (2023)'s new dataset containing information on consumption and subjective well-being for the Spanish population. The research questions guiding this paper are the following: 1) what does the relationship between consumption and life satisfaction look like for Spanish data?, 2) how does this change for different levels of consumption?, and 3) what can we say about overconsumption and its relationship to subjective well-being? This study will address the issue of the endogeneity of consumption by applying instrumental variable methods to test for and correct for this issue. Section 2 will review the data used in the study and the methods, including the linear regressions, the generalized additive model (GAM), and the endogeneity analysis. Section 3 will present the results: first from the endogeneity analysis, and then from the linear regressions and the GAM. Section 4 will discuss the implications of overconsumption and will review limitations of this study and future expansions.

2. Methods

2.1 Data

The data used in this study comes from a new synthetic dataset created by Tomás et al. (2023), with detailed information on consumption from the Spanish Household Budget Survey (HBS, 2018) and subjective well-being measures from the Spanish Statistics on Income and Living Conditions Survey (SILC, 2018). The two surveys were merged through a novel matching strategy tailored by Tomás et al. for the SILC and HBS datasets. The authors use a two-stage non-parametric approach with complete information that significantly reduces the uncertainty about the fused dataset generated compared to other approaches. The

matching results in a consistent fusion of the household disposable income and subjective well-being from SILC, and total consumption expenditure from HBS, as well as their respective components in the new dataset.

This study uses the data for Spanish households from Tomás et al. (2023)'s synthetic dataset, which represents cross-sectional data of 26,060 individuals representative of the Spanish population, and has detailed information on household consumption, including more than 400 consumption categories, as well as data on income, subjective well-being and other demographic variables. Questions on subjective well-being include overall life satisfaction, affective measures, and questions about personal relationships, which may be relevant to well-being. People in this survey are asked to rate their overall life satisfaction on a scale of 0 (not at all satisfied) to 10 (completely satisfied).

Information on consumption and income in this dataset represents the previous year's household consumption or income, while all other variables are collected for the year of the survey. The main variables used in the analysis are the following: overall life satisfaction, total household consumption, and the following covariates: age, gender, marital status, education, employment status, health, and household type. Total consumption represents consumption in all categories according to the Spanish Household Budget Survey. Per capita consumption was calculated by dividing total household consumption by the number of adult equivalents in the household, according to the OECD modified equivalence scale. Marital status represents the following categories: 1) single/never married, 2) married, 3) divorced/ separated, and 4) widowed. Education was divided into 1) primary education, 2) secondary education or vocational training, and 3) higher education, and employment status into 1) full-time employed, 2) full-time self-employed, 3) part-time employed or self-employed, 4) student or unpaid internship, 5) fulfilling domestic tasks, 6) unemployed, 7) disabled or unfit for employment, 8) retired, and 9) other inactive. Household type was used to code the presence of children in the household as a variable, and the health variable was a yes/no response to a question asking if respondents suffered from any chronic (long-standing) illness or condition. The variables household size, number of rooms, household type, tenure status (e.g. owner or renter), dwelling type (e.g. detached house or apartment) as well as the individual consumption categories of food and transportation were used as instrumental variables. Following Brown & Gathergood (2020), the top and bottom 1% of per capita consumption and income were removed due to the presence of outliers. Additionally, only individuals 18+ years of age were included in the analysis and NAs were removed for relevant variables.

For the analysis, the household and individual data were combined so that all individual data on demographic variables remained intact and household variables were added to individual data points for each household. This stands in contrast to the approach of aggregating individual level variables at the household level and having one data point for each household. While the aggregation of individual level variables can work for some variables, such as the percentage of female members of the household or the percentage of unemployed members, it does not make sense for other variables, such as taking the average of individual well-being scores to represent household well-being or averaging age across household members. Another approach is the use of only the reference member of the household, and although this does not have the aggregation problems described before, this approach omits the data of other household members, and assumes that the demographic characteristics of the reference member of the household are representative of other members of the household, which is likely untrue. Because of the flaws with both the aggregation of individual level variables and the use of the reference member of the household, this paper's method uses an individual level approach to the analysis described above. This can also be understood by the importance of individual level variables in determining subjective well-being, where individual covariates such as employment status and health may be most important in determining a person's subjective well-being.

2.2 Linear Regressions

A linear regression with a quadratic term was performed to determine the shape of the relationship between life satisfaction and consumption. The linear regression for the first stage of the analysis is defined as:

$$\boldsymbol{LS_i = \alpha + \beta_1\, log(c_i) + \beta_2\, log(c_i)^2 + \gamma\, X_i + u_i} \quad \textbf{(1)},$$

where LS_i represents overall life satisfaction on a scale of 0 (not at all satisfied) to 10 (completely satisfied) for individual *i*, c_i represents per capita yearly consumption of the household, and X_i represents the following covariates: age, gender, marital status, education, employment status, health, and the presence of children in the household of individual *i*. The natural logarithm (log in (1), hereafter "logarithm") of per capita consumption is used, following previous research, since it is expected that percentage and not absolute increases in income or consumption will be associated with improved subjective well-being. For example, a $1,000 increase in salary may make a big difference for someone making $20,000 a year,

representing a 10% raise but not for someone making $200,000 a year, where it only represents a 1% increase in their salary.

Recalling the studies on consumption in Section 1, we expect the relationship between consumption and life satisfaction to be non-linear and concave. Because of this, both the linear and squared term of the logarithm of per capita consumption are included in Regression (1).

An analysis of different levels of consumption with multiple linear regressions was conducted, to assess the changes in the coefficient of consumption at different consumption levels:

$$\boldsymbol{LS_i = \alpha + \beta_1\, log(c_i) + \gamma\, X_i + u_i} \quad \textbf{(2)},$$

where the variables and covariates are the same as in Regression (1). The squared term for consumption is omitted since we do not expect to see a quadratic shape to the curve at smaller intervals. This analysis was carried out for three levels, where each level represents a third of the total sample, with the following categories: low, mid, and high consumption. Low consumption is consumption below €13,565/year (n = 8678), mid consumption is consumption between €13,565/year and €19,886/year (n = 8678), and high consumption is consumption above €19,886/year (n = 8704). All regressions were performed using robust errors to account for possible heterogeneity expected to arise in the error term.

2.3 Generalized Additive Model

GAMs represent a semi-parametric approach to econometric modelling. Instead of being constrained to a linear or polynomial function assigned in linear regressions, GAMs allow for the modelling of more complex relationships between relevant variables. Thus, the GAM represents a more flexible method to model non-linear relationships. With the data for this study, the GAM allows us to see how the relationship between consumption and life satisfaction changes as we move through different levels of consumption. A GAM was run with the same explanatory variables as in the linear regression:

$$\boldsymbol{LS_i = \pi + s\big(log(c_i)\big) + s(age_i) + \delta\, X_i + v_i} \quad \textbf{(3)},$$

where the $s()$ represents the smooth term or spline, applied to all continuous variables in a GAM. The smooth term represents the sum of the basis functions, and can take on a wide variety of shapes. These were applied to the continuous variables for this model: age and the logarithm of per capita consumption, as the rest of the covariates are dummy variables. The

GAM was modelled following Wood (2008) using cubic splines, and the restricted maximum likelihood method was used since it provides the most stable and reliable results.

2.4 Endogeneity of Consumption

The issue of endogeneity may be present for the consumption variable in this model, if life satisfaction is determined by the following regression:

$$\boldsymbol{LS_i = \alpha + \beta_1(C_i) + \gamma X_i + u_i} \quad (\mathbf{4}),$$

where C_i represents consumption, and consumption is determined as follows:

$$\boldsymbol{C_i = \eta + \delta Z_i + \varepsilon_i},$$

where Z_i represents variables relevant to consumption. If a higher level of consumption is associated with a higher level of life satisfaction, u and ε will be correlated. Therefore, in (4) as in regressions (1) and (2), consumption will be correlated with the error term which will cause biased estimations due to endogeneity.

This issue can also be understood by third or omitted variables. Brown & Gathergood (2020) address the issue of unobserved time-invariant confounding individual differences, such as personality, which may cause higher (lower) life satisfaction and higher (lower) consumption. One can think of an extroverted person who is happier and consumes more or an introverted person who consumes less and is less happy as an example.

For the testing and treatment of endogeneity a two stage least squares (2SLS) approach using instrumental variables was applied. The instrumental variables used were the following: household size, number of rooms, household type, dwelling type, tenure status, and food and transport consumption categories. Dummy variables for household type, dwelling type, and tenure status were created. First, the Wu-Hausman test was applied to test for endogeneity, and subsequently, instruments were tested with the Sargan test and the Weak Instruments test. The Sargan test tests overidentification restrictions and the validity of instruments while the Weak Instruments test tests the strength of instruments. Another approach called Heteroskedasticity-Based Instrumental Variables, as described by Quiroga (2021) was used to test and correct for endogeneity in this model. This method takes advantage of heteroskedasticity available in possible instruments, such as those listed above or other covariates, in order to create new instruments. All instruments were tested using a 2SLS approach using the base linear regressions (1) and (2).

3. Results

3.1 Descriptive Statistics

The summary statistics of all variables used in the regressions can be found in Table 1 and Table 2 below.

Variable	*Mean*	*Median*	*Std. Dev*	*Min*	*Max*
Age	52.31	52.00	18.24	18.00	87.00
Life Satisfaction	7.35	8.00	1.78	0.00	10.00
Consumption	17,871.00	16,485.00	7,918.76	4,844.00	50,017.00

Table 1. Descriptive statistics of the sample (N = 26,060) - continuous variables.

Variable	*Description*	*Frequency*
Gender	*Female*	0.52
	Male	0.48
Marital Status	*Single/never married*	0.28
	Married	0.57
	Separated/divorced	0.22
	Widowed	0.09
Education Level	*Primary school*	0.24
	Secondary or vocational school	0.48
	Higher education	0.28
Employment Status	*Full-time*	0.34
	Part-time	0.06
	Full-time self-employed	0.07
	Unemployed	0.10
	Student/unpaid internship	0.06
	Retired	0.21
	Disabled/unfit to work	0.03
	Fulfilling domestic tasks	0.12
	Other inactive	0.01
Health Issues	*Suffer from chronic illness*	
	Yes	0.35
	No	0.65
Household Type	*Children in the household*	
	Yes	0.40
	No	0.60

Table 2. Descriptive statistics of the sample (N = 26,060) - categorical variables.

3.2 Endogeneity and Instrumental Variables

The results of the endogeneity analysis using instrumental variables and the heteroskedasticity based instrumental variables method will be reviewed first, as these results affect the interpretation of all following regressions. The endogeneity analysis found that the presence of endogeneity cannot be confirmed. Several results led to this conclusion: 1) instruments and their subsets did not consistently pass all tests (Wu-Hausman, Sargan, and Weak Instruments test), 2) there was a large difference in the coefficients after the "correction" for endogeneity, and 3) this correction led to a change in the functional form not expected based on previous studies (Noll & Weick, 2015; Tsurumi et al., 2021). Since the presence of endogeneity cannot be confirmed, the results from the linear regressions and the GAM will be presented without any correction for endogeneity.

3.3 Linear Regressions

The results from Regression (1) found a significant and positive effect of the linear term for consumption and a significant and negative effect of the squared term (see Table 3). This indicates a concave curve defining the relationship between consumption and life satisfaction, in line with previous studies (Noll & Weick, 2015; Tsurumi et al., 2021). The shape of this relationship based on Regression (1) results can be seen in Fig. 1, with all covariates kept at a constant level. Coefficients for all other covariates showed the expected signs based on previous studies (see the Appendix for full Regression (1) results).

Variable	***Coef.***	***Std. Error***
log(c)	4.98	1.23 ***
log(c)^2	-0.23	0.06 ***

*,**, *** indicate 10%, 5%, 1% significance level respectively

Table 3. Regression (1) Results

The level analysis in Regression (2) found decreasing marginal effects of consumption with increasing consumption levels (see Table 4). The coefficient for low consumption was 0.73, followed by 0.69 for mid consumption and 0.29 for high consumption. Thus, consumption in the highest third, above €19,886 pc/year gives less than half of the life satisfaction compared to consumption in the bottom third, below €13,565 pc/year. These decreasing marginal effects confirm the results from Regression (1) as well as the results from previous studies (Noll & Weick, 2015; Tsurumi et al., 2021).

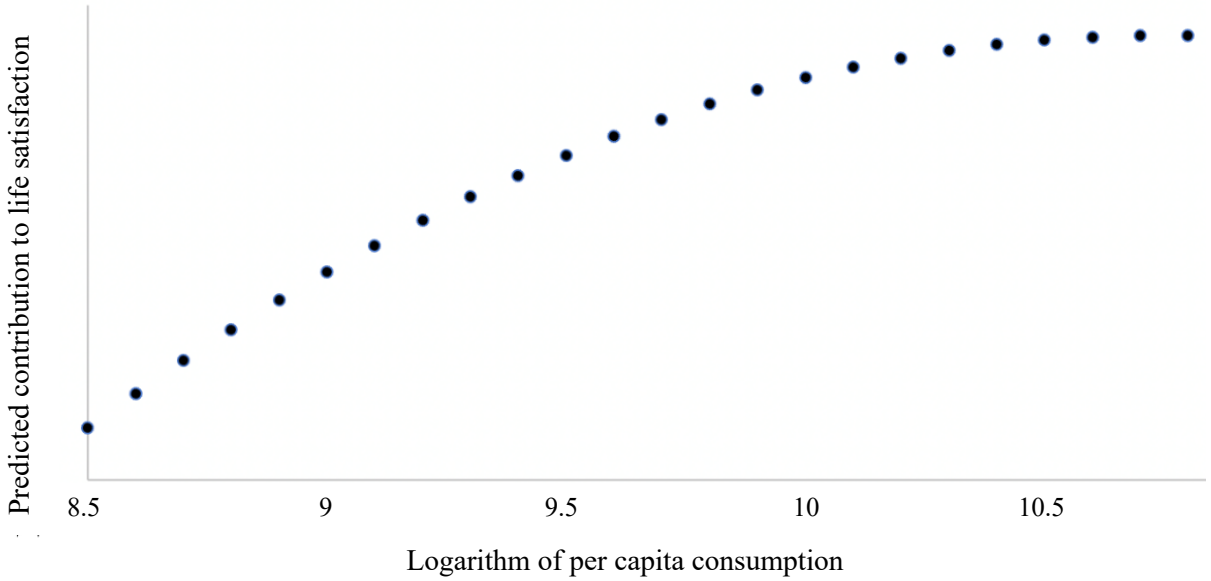

Figure 1. Regression (1) Results

Variable		*Low Consumption*	*Mid Consumption*	*High Consumption*
log(c)	*Coefficient*	0.73	0.69	0.29
	Std. Err	0.13	0.22	0.10
		***	***	***
*,**, *** indicate 10%, 5%, 1% significance level respectively				

Table 4. Regression (2) Results

3.4 GAM

The results from the GAM indicate that the smooth term for consumption is statistically significant, with concave curve defining the relationship between consumption and life satisfaction (see Fig. 2). Results of the model indicate a significant non-linear and non-quadratic relationship (see the Appendix for full GAM results). Comparing the linear regression results seen in Fig. 1 and the GAM results in Fig. 2, we can see important similarities: a concave curve defining the relationship with decreasing marginal returns, and a very similar shape of the curve. The similarity of results obtained from two different (parametric and semi-parametric) approaches grants validity to the results obtained. This may also indicate that the issue of endogeneity is not severe, as endogeneity would affect the models from the parametric and semi-parametric approaches in different ways and lead to more marked differences in the results.

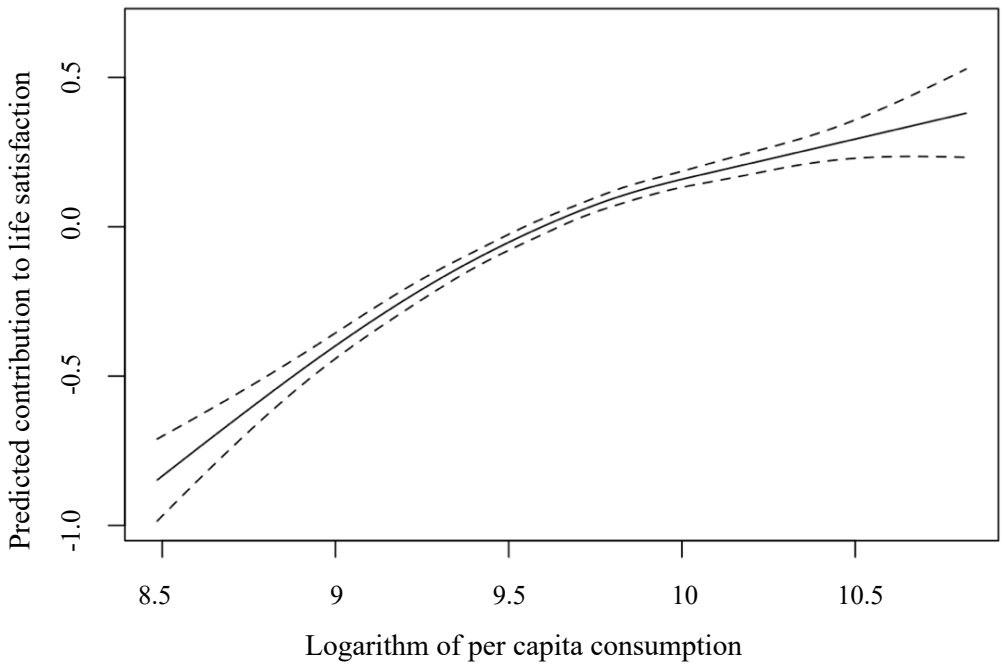

Figure 2. GAM – Logarithmic scale

The GAM additionally shows a satiation point for consumption, above which increased consumption does not increase life satisfaction. This is estimated to be approximately €26,500 of per capita consumption per year (see Fig. 3). A linear regression estimating the relationship between consumption and life satisfaction for per capita consumption above €26,500 per year confirmed this result, indicating a non-significant impact of consumption (see Appendix).

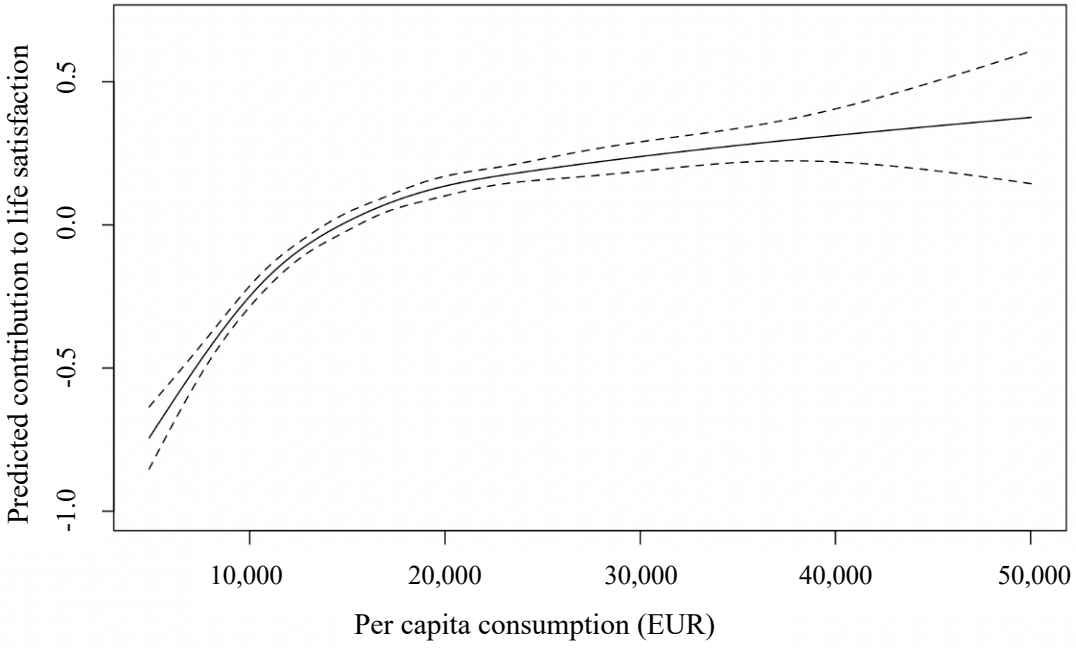

Figure 3. GAM – Level scale

4. Discussion

The results of this study have found that the relationship between consumption and life satisfaction is non-linear and concave for Spanish data, with decreasing marginal returns: consumption in the top third (over €19,886 pc/year) gives less than half of the SWB compared to the bottom third (less than € 13,565 pc/year). The satiation point is approximated to be at € 26,500/year of pc consumption (€ 2,208/month), after which increased consumption does not improve life satisfaction. The results from the linear regressions and the GAM are very similar, granting validity to these results obtained through two different (parametric and semi-parametric) approaches. The endogeneity analysis indicates that the presence of endogeneity cannot be confirmed, and the similarity of results from the linear regressions and the GAM may indicate a low severity of the endogeneity of consumption.

Some of the main limitations of this study are the uncaptured impacts of important factors on subjective well-being, such as personality and environmental effects. Previous research has shown that subjective well-being has a strong genetic component associated with personality (Weiss et al., 2008), and while other studies using panel data have been able to correct for such time-invariant effects, this was not possible with the cross-sectional dataset used for this study. Additional variables related to an individual's environment such as crime or material deprivation could negatively affect their life satisfaction, while factors such as having close relationships or living near natural areas could have positive effects (Jones et al., 2020). Information on crime, material deprivation and personal relationships were included in the SILC survey but these variables were not introduced into the model because they were self-rated and thus were at risk for introducing endogeneity.

Income was not used as the main predictor of life satisfaction due to the theoretical and empirical arguments laid out in Section 1.3, and was not introduced into the regression because of econometric issues due to the multicolinearity with consumption. This issue led to negative coefficients of consumption in some quantiles during the testing stage of different levels for the multi-regression analysis, which does not make sense for this analysis. It also led to an unexpected functional form, in line with negative effects of consumption for some quantiles, with similar results found when income deciles were included as dummy variables. Some previous authors, using both income and consumption in their models, have described negative relationships between specific consumption categories and subjective well-being,

and it is possible that this issue could be caused by their inclusion of both consumption and income in their models.

Future research could explore the relationship between consumption and affective well-being, which was included in Tsurumi et al.'s 2021 study. Recent research looking at income and affective well-being found that the relationship between income and emotional well-being looks very different for the happiest and saddest people (Kahneman, Killingsworth, & Mellers, 2022). Future expansions could also break down total consumption into different types of consumption, such as housing, transport, or diets. The difference between material and relational consumption, conspicuous and non-conspicuous consumption, as well as specific consumption categories have been explored with different datasets, and it would be interesting to compare the results between different countries in the EU with Tomás et al. (2023)'s dataset on the European level. Connecting the relationship between specific consumption categories and subjective well-being would allow us to explore the environmental effects of overconsumption. If we find that above a certain point, increased consumption of a specific good does not increase subjective well-being, we can decrease this type of consumption without negatively affecting well-being. This could be relevant for EU policy decisions, especially in categories such as transport (e.g. commuting or airplane travel) or diets (e.g. red meat consumption), where lower carbon emissions could be associated with higher (or unchanged) subjective well-being. Another research line could explore subjective well-being related to the effects of policies aimed at guaranteeing the satisfaction of basic needs such as universal basic income.

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Appendix

Variable	*Coef.*	*Std. Error*	
Age	-0.04	<0.01	***
Age^2	<0.01	<0.01	***
Female	0.07	0.03	**
Married	0.30	0.05	***
Separated	-0.25	0.08	***
Widow	-0.22	0.08	***
Secondary or vocational education	0.37	0.05	***
Higher education	0.60	0.05	***
Employed part-time	-0.23	0.07	***
Full-time self-employed	-0.06	0.05	
Student	0.08	0.08	
Fulfilling domestic tasks	-0.05	0.06	
Unemployed	-0.90	0.06	***
Disabled/unfit to work	-1.07	0.15	***
Retired	0.08	0.06	
Other inactive (employment)	-0.31	0.12	**
Children in the household	0.05	0.04	
Health condition	-0.68	0.04	***
Log of pc consumption	4.98	1.23	***
Log of pc consumption squared	-0.23	0.06	***
*,**, *** indicate 10%, 5%, 1% significance level respectively			
R-squared = 0.17			

Table A. Regression (1) Results

In Table A, the base category for marital status in the regression is being single/never married, for education is having a primary education, and for employment is being employed full-time.

Variable	*edf*	*F-statistic*	
log(c)	3.36	83.2	***
age	6.14	20.1	***
*,**, *** indicate 10%, 5%, 1% significance level respectively			
R-squared = 0.17			

Table B. GAM Results

In Table B, *edf* represents effective degrees of freedom. For any GAM, an *edf* value of 1 indicates a linear relationship, a value of 2 indicates a quadratic relationship, and values above two represent non-linear and non-quadratic relationships. The F-statistic represents the significance of the smooth terms in the GAM.

Variable	*Coef.*	*Std. Error*	*p-value*
log(c)	0.31	0.20	0.11
n = 3,581			

Table C. Regression for Consumption above €26,500