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Do people think they have enough?
A subjective income sufficiency assessment

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Abstract

To what degree do individuals experience sufficiency in contemporary society? Although this question is highly relevant from an environmental sustainability point of view, empirical research on this topic is limited. In this article we conceptualize and measure sufficiency from a subjective perspective in a micro-economic context using two concepts: what level of personal monthly income is considered to be enough (sufficiency level) and to what degree do individuals evaluate their personal monthly income as being enough (sufficiency evaluation). The second concept is measured both directly and indirectly. Additionally, we perform an explorative investigation of the potential determinants of the concepts by regression analysis with a main focus on economic variables (income and homeownership) and personal values (materialism and environmental self-identity). Based on Belgian survey data (N=1645) we find that, while the vast majority of individuals evaluate their income to be at least sufficient, there is substantial variation across individuals as to what level of income is considered to be enough. Furthermore, our regression results suggest that personal monthly income plays a primary role for subjective income sufficiency, albeit with contradicting effects for both concepts: having a higher income is associated with a higher income sufficiency evaluation, yet also pushes the quoted sufficiency level upwards. Homeownership is positively related to one of both concepts only: homeowners (whose property is fully paid off) directly evaluate their income as being more sufficient compared to non-homeowners, but they do not quote different sufficiency levels. On the other hand, our results show that materialism as well as environmental self-identity negatively contribute to subjective income sufficiency: being more materialistic is associated with both a lower income sufficiency evaluation as well as a higher quoted sufficiency level, while seeing oneself more as acting environmentally-friendly is found to push the quoted sufficiency level further upwards. We conclude that the high levels of subjective income sufficiency reported by the respondents are promising to the extent that this may suggest society is ready for environmental strategies that are focused on the demand-side.

Keywords

environmental sustainability, sufficiency strategy, subjective income sufficiency, personal income assessment, sufficiency level, sufficiency evaluation

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1. Introduction

Evidence on humankind's unsustainable use of the natural environment is building up over the past couple of decades. Steffen et al. (2015) note that four out of nine ecological ceilings are currently being transgressed within the planetary boundaries framework: climate change, biosphere integrity, biogeochemical flows and landsystem change. Concerning climate change, for example, the IPCC (2018) states that global warming is expected to reach the critical boundary value of 1.5°C somewhere between 2030 and 2052 if carbon emissions continue to increase at the current rate. The report concludes that keeping global warming below this target will require rapid, far-reaching and unprecedented changes in all aspects of society. In general, action must be taken straightaway if we are to avoid planetary catastrophes and want to ensure the ability of both current as well as future generations to meet their needs.

Technology and technological solutions are often put central in the debate on how to achieve environmental sustainability. However, ever more questions are being raised with respect to the complementary role of behavioural changes and social practices. Both pathways to environmental sustainability come together in the I-PAT equation, which states that environmental impact results from a combination of population, affluence and technology (Ehrlich & Holdren, 1971). Based on this equation two fundamentally different strategies can be identified to achieve environmental sustainability: efficiency and sufficiency. The former strategy focuses on the supply side by targeting technology: it implies achieving the same level of affluence using lower material and energy inputs per unit of production. In contrast, the latter strategy focuses on the demand side by targeting the affluence factor: it envisions a lower level of affluence altogether and therefore requires a change in behaviour and consumption patterns. Despite efficiency being by far the hitherto most widely applied strategy, multiple authors have questioned whether it will suffice on itself to tackle the vast environmental challenges. While this strategy may lead to relative decoupling, there is currently no empirical evidence in support of absolute decoupling at the global level: the decline in material or emission intensities of production are outweighed by increases in economic activities, resulting in increasing environmental impacts (Hickel & Kallis, 2020; Jackson, 2009; Parrique et al., 2019). As a result a growing body of literature is emphasizing the importance of sufficiency as an essential complementary strategy to efficiency. Environmental goals are increasingly being thought of as only being achievable when technological improvements are complemented with profound lifestyle changes including an alteration of consumption behaviour (Creutzig et al., 2018; Dietz & O'Neill, 2013; European Environment Agency, 2020; Haberl et al., 2020; Princen, 1999; Wiedmann et al., 2020). Moreover, it is argued that both from an intra- and an intergenerational equity point of view, richer communities and countries

should lead the way in reducing (over)consumption to free up ecological space and resources for poorer communities and countries. While high levels of material well-being in affluent parts of the world can sustain halting or even reversing growth, the poorer parts can still gain a lot from growth (Goodland & Daly, 1992; Røpke, 1999).

A growing body of literature on sufficiency is reflecting the enhanced interest in questioning the affluence factor in the I-PAT equation. First, multiple authors have explored sufficiency strategies from a theoretical and mostly macro perspective (e.g. Alcott, 2008; Figge et al., 2014; Princen, 2005). Additionally, sufficiency is central to a wide variety of rationales and movements that aim to go beyond economic (GDP) growth, including degrowth (Alexander, 2013; Demaria et al., 2013; Lorek & Fuchs, 2013; Paulson et al., 2020), post-growth (Raworth, 2017) and the Voluntary Simplicity Movement (Alexander & Ussher, 2012; Leonard-Barton, 1981). The more tangible implementation and implications of sufficiency for individuals is investigated in other research areas. For example, on a more general level, the literature on pro-environmental behaviour and sustainable consumption focuses on how consumption behaviour can be altered in order to reach environmental sustainability. On a more detailed level and in more recent literature, scenarios of sufficiency lifestyles and sufficiency oriented policies are discussed (Bohnenberger, 2021; Vita et al., 2019). However, little research has been devoted to individuals' perceptions on sufficiency and 'having enough', and to whether they would support policies aimed at reducing affluence levels.

Sufficiency strategies will ultimately require top-down policy decisions, yet the success of such strategies will depend on the bottom-up cooperation of communities and individuals (European Environment Agency, 2020; Princen, 2005; Schäpke & Rauschmayer, 2014). Consequently, individuals should be considered as key actors when analysing sufficiency. More specifically, an exploration of individuals' perceptions on 'having enough' and whether they currently experience sufficiency would offer valuable insights. On the one hand, it can be expected that individuals in industrialized communities experience (at least) sufficiency to a certain extent. To begin with, this assumption follows from the fact that wealthy nations nowadays achieve the majority of minimal social thresholds which represent basic human needs (O'Neill et al., 2018). Secondly, the happiness economics literature suggests that there is room for reducing consumption without negatively affecting happiness: the conventional finding that subjective well-being is strictly positively correlated with income or consumption has been proven to be outdated, especially in industrialized countries (e.g. Diener et al., 1999; Easterlin, 1974). Multiple researchers have found the relationship between income and subjective well-being in cross sectional data to be curvilinear, reflecting the decreasing marginal utility of income: the effect of a fixed increase in real income on subjective well-being becomes progressively smaller as the initial level of income is higher (Diener et al., 1993; Veenhoven, 1991). Moreover, the association between income growth and subjective well-being completely disappears when looking at long term

time series data, a phenomenon better known as the Easterlin paradox (Easterlin, 2013). Consequently, there is not much additional improvement in subjective well-being to be gained from further increases in income once a certain level of income which covers for basic needs has been reached (Ahuvia, 2002). The degrowth literature further argues that an equitable and widespread decline in consumption would not automatically affect subjective well-being in a negative way because of two key phenomena: adaptation and social comparison (Sekulova, 2014). Some authors go so far as to suggest that reducing (over)consumption in industrialized societies may even improve social and psychological well-being (Jackson, 2005; D. W. O'Neill et al., 2010). On the other hand, one can assume that the experience of sufficiency critically relies on other factors as well. According to hedonic research, comparative position is what ultimately matters for subjective well-being: comparing oneself to others (social comparison) or to oneself in the past (habituation) may lead to lower levels of subjective well-being, despite having a high absolute level of income (Clark et al., 2008; Luttmer, 2005; Solnick & Hemenway, 1998). Depending on the degree to which consumerism is dominantly present in today's culture, for example, conspicuous consumption could prompt individuals to compare themselves with others. Besides these two relative phenomena, an additional explanation for the lack of correlation in panel or time series data between absolute income level and subjective well-being is adaptation: individuals tend to grow accustomed to an increased income or consumption level. Because a rise in income leads to a rise in expectations, the level of subjective well-being remains unaffected, leaving individuals trapped in the hedonic treadmill (J. O'Neill, 2006). As a consequence of these phenomena, experienced sufficiency might be lower than initially expected, even within industrialized countries where income and consumption levels are relatively high. Additionally, experiencing sufficiency can be thought of as a necessary – though not sufficient – requirement for individuals to be open towards lowering consumption levels. It can be hypothesized that the more individuals think they have enough, the more they will consider lower-consumption lifestyles as potentially viable or even beneficial. In this regard, a general sense of sufficiency experienced in society might open up promising avenues with respect to the feasibility of sufficiency as a strategy to achieve environmental goals.

We aim to contribute to the literature by empirically investigating subjective sufficiency experiences at the individual level. However, questions relating to 'how much is enough' should be asked within a specific context (Spengler, 2016). In this study we decided to study subjective sufficiency from an income perspective. Furthermore, we do not consider ecological motivations as prerequisites: rather than focusing on niche movements (e.g. the Voluntary Simplicity Movement), we aim to map the general experience of sufficiency in a population regardless of underlying motivations. In summary: we aim to explore to what extent sufficiency is being experienced at the individual level in contemporary society, specifically with respect to income.

A first research objective of this paper is to map subjective income sufficiency using different concepts. First, we investigate how much income is considered to be enough (sufficiency level). Second, we analyse to what extent individuals think they have a high enough income (sufficiency evaluation). We approach the latter concept both directly and indirectly – i.e. asking individuals whether they consider their income to be sufficient, and comparing their reported income levels to the sufficiency level that they reported (direct and indirect sufficiency evaluation). We develop sufficiency measures for each of the concepts drawing on the literature on income measurement and income evaluation. Beyond mapping subjective income sufficiency, a second research objective is to explore the determinants of each of the concepts using regression analysis. Here, we focus on the role of two key groups of determinants: economic variables (personal monthly income and homeownership) and personal values (materialism and environmental self-identity).

The remainder of the paper is organized as follows. Section 2 reviews existing economic literature on sufficiency-related concepts. Section 3 presents the survey, the data, the concepts and the methods used in our analysis. Section 4 contains the results and section 5 the discussion, while section 6 concludes.

2. Literature review

A large amount of sufficiency-related concepts has been put forward in economic literature, most of which have been operationalised in empirical work through the development of multiple measurement instruments. In what follows, section 2.1 presents the different measurement tools that can be used to measure either how much income or whether income is considered to be enough. This collection of tools provides the starting point for the selection and construction of the measures for the two concepts that are central in this study (see sections 3.2.1 and 3.2.2). Next, section 2.2 discusses the determinants of economic sufficiency-related concepts that have been empirically investigated. This review serves as inspiration for selecting determinants in the explorative investigation (see section 3.2.3).

2.1 Measurement tools

2.1.1 Measuring what level of income is considered to be enough

Over the years several question modules have been put forward in economic literature that can be used to inquire about the level of income that is considered to be enough. The most prominent amongst these question modules is the Income Evaluation Question (IEQ). This question asks respondents to quote six to ten levels of income, each corresponding to a given welfare level which is defined with terminology relating to ‘sufficient’, ‘good’ and ‘bad’. The outcome of this question is an individual norm: by interpolating an individual’s personal income, his or her self-evaluation relative to his or her norm can be identified (Van Praag & Ferrer-i-Carbonell, 2004). The IEQ was originally developed by Van Praag (1971) in the context of the Leyden School Project. Bridging the gap between happiness economics and

welfare economics, it was initially constructed to empirically investigate the individual welfare function of income (WFI). Within this literature, one of the most prominent findings is that individuals' evaluation of income is influenced by their actual income: income aspirations were found to be related to the income level that was actually attained. This phenomenon of evaluation norms drifting along with rising income is referred to as 'preference drift'. Given that the question module provides much information, that is six to ten variables measured at the ratio level, several authors have made use of it later on to serve different purposes. For example, while Van den Bosch (1996) used IEQ in the context of social welfare to estimate subjective equivalence scales, Ferrer-i-Carbonell and Van Praag (2001) turned to the construct in the context of poverty measurement to estimate subjective poverty lines. Furthermore, the IEQ has been used in more general contexts to subjectively assess an individual's economic well-being (Garner, Stinson, & Shipp, 1996; Van Praag & Ferrer-i-Carbonell, 2004). Multiple variants of the question appear in the literature (see Appendix 1 for an overview). These typically differ with respect to the number of welfare levels for which an income level must be quoted (six to ten levels) or to the income level to be considered (individual or household). However, all variants share a common sufficiency-related terminology as far as the response options are concerned: one of the income levels that a respondent has to enumerate, relates to a 'sufficient' level of income.

Beyond the IEQ, other income-related sufficiency questions measured at the ratio level have been constructed. For example, the Minimum Income Question (MIQ) asks respondents to quote the (absolute) minimum level of income that would be required to make ends meet (Garner et al., 1996; Goedhart et al., 1977; Van den Bosch, 1996) while the Minimum Spend Question (MSQ) asks respondents to quote the amount of money to be spent each month in order to provide the basic necessities for their family (Garner et al., 1996). However, the terminology used in the formulation of these questions tends to refer to a minimum standard, looking at sufficiency differently than in the IEQ.

2.1.2 Measuring whether income is considered to be enough

Next, we consider the direct measurement of whether an individual considers their current income level to be sufficient. We have identified multiple closely related concepts in economic literature of which the corresponding measurement tools can be used to answer this question. Appendix 2 lists a selection of key papers in which the concepts are discussed together with their measures focussing on both questions and response options. After grouping related concepts, three key categories can be identified: income sufficiency, perceived income adequacy (PIA) and financial satisfaction. Each of the concepts in these categories entails to a certain extent a personal assessment of an individual's economic well-being. Furthermore, the concepts have in common that they are generally measured using a single question and at the ordinal level or binary level. However, the three categories differ with respect to the terminology used in the questions and/or their respective response options. While income sufficiency concepts primarily make use of sufficiency-related terminology (e.g. 'how sufficient do you consider the amount of money', 'highly (in)sufficient', 'totally sufficient', 'not at all sufficient'), PIA concepts

generally include terminology that refers to a minimum standard. This holds for the formulation of both questions (e.g. 'being able to make ends meet', 'finding it adequate or difficult to manage on income', 'enough income to live on') as well as response options (e.g. 'coping on present income', 'can meet necessities only'). Finally, turning to financial satisfaction concepts, the terminology used in these questions and response options most often relates to feelings (e.g. 'feeling about' or 'describing' one's financial situation, 'being satisfied', 'being content', 'being happy').

In this paper, the analysis of the two concepts of subjective income sufficiency primarily aims to express the broader notion of sufficiency. Therefore, when selecting and constructing variables for the measurement of the different concepts (see sections 3.2.1 and 3.2.2), the scope is limited to measurement questions in which sufficiency-related terminology is used.

2.2 Determinants

Through the above screening of the economic literature we have identified a broad range of sufficiency-related question modules (e.g. IEQ, MIQ, MSQ) and concepts with accompanying measurement questions (e.g. income sufficiency, PIA, financial satisfaction). However, these question modules and concepts vary from one another with respect to the fields of research in which they emerged as well as the way in which they have been employed.

Question modules were primarily designed to provide useful measurement tools in support of specific analyses in a wide variety of research domains. The IEQ, for example, has been used both in general settings (i.e. estimating economic well-being) as well as in more specific contexts as diverse as social welfare (i.e. estimating equivalence scales) and poverty measurement (i.e. estimating poverty lines).

Moving to the sufficiency-related concepts, we find that income sufficiency and PIA have primarily been used as a measure of subjective income in literature on health and gerontology. In this literature both concepts have been adopted as either predictor variables (El Ansari & Haghgoo, 2014; Mikolajczyk et al., 2008 for income sufficiency; Jatrana & Chan, 2007; Matthews et al., 2005; Pereira & Coelho, 2013 for PIA) or as outcome variables (Anderzén et al., 2020; Bento & Lebrão, 2013; Gori-Maia, 2013; Tarasenko & Schoenberg, 2017 for income sufficiency; DePianto, 2011; Draughn et al., 1994; Gildner et al., 2019; Grable et al., 2013; Litwin & Sapir, 2009; Stoller & Stoller, 2003 for PIA). We did not find an extensive literature review that focuses on the determinants of either of these concepts. Financial satisfaction, in contrast, has appeared in a broader array of literature ranging from economics and happiness studies to social sciences in general. Similar to the first two concepts, financial satisfaction has been used both as a predictor variable and as a variable of interest (Crawford Solberg et al., 2002; D'Ambrosio & Frick, 2007; DePianto, 2011; Ermiș-Mert, 2020; Hansen et al., 2008; Hastings, 2019; Joo & Grable, 2004; Vera-Toscano et al., 2006; Xiao et al., 2014). Here, we did find a number of review studies identifying the determinants of financial satisfaction – e.g. Fan & Babiarz (2019), Joo & Grable (2004) and Sahi (2013). These authors find that typically three groups of determinants can be

disentangled. First, demographic variables including age, gender, marital status, household composition and ethnicity are found to impact financial satisfaction: age and being married (compared with being single or divorced) are repeatedly found to be positively related to financial satisfaction, while on average women report lower levels of financial satisfaction than men. The second group, socio-economic variables, consists of education and socio-economic position. Whereas a higher educational level relates on average to a higher level of financial satisfaction, certain socio-economic positions (in particular unemployment and retirement) are found to be negatively related to financial satisfaction. Finally, economic and financial variables matter as well: the three main determinants within this domain (income, homeownership and net worth) are found to positively relate to financial satisfaction. Other variables within this domain include saving rates and financial behaviour, knowledge, stressors, solvency and attitudes.

In conclusion, review studies on determinants of sufficiency-related concepts have primarily focused on financial satisfaction. Therefore, we start from these studies as primary source of inspiration when selecting determinants for the explorative investigation of the two concepts. However, since our concepts (based on sufficiency-related terminology) are not identical to financial satisfaction (based on terminology related to feelings), findings regarding these determinants may differ. Furthermore, our final set of selected determinants includes additional variables whose role has not yet been explored in the literature on financial satisfaction. Further details on the motivation and selection of these additional determinants are presented in section 3.2.3.

3. Data and methods

3.1 Sample

In this study we draw on data from the 2020 edition of the LEVO survey, short for 'LEvensomstandigheden in Vlaanderen Onderzocht' or 'Inquiry into the life circumstances in Flanders' (the northern Dutch speaking part of Belgium). This large-scale survey has been carried out annually since 2010 and primarily focuses on the measurement of subjective well-being and its determinants. Each year additional modules are introduced to the base survey, and in the 2020 edition we developed and included a series of questions related to subjective income sufficiency. The data are collected by students at Ghent University under supervision of different professors at the Department of Economics in return for class credit. The students are provided with the survey and receive detailed instructions on how to conduct questionnaire interviews and how to code the responses they collected. After collection and coding by students, the dataset is verified and cleaned by the authors.

For 2020, the data were collected in two waves (N = 1116 in April 2020 and N = 1531 in November 2020). Beyond excluding observations with missing or faulty data[2], students were left out of the analysis because their answers relating to income and subjective income sufficiency are considered to be inaccurate. The participants in the remaining sample (N=1645) were weighted to be representative of the Flemish population (based on data from the Labour Force Survey 2019) for socio-economic position, gender and age[3]. The weighted sample consists of 51% female and 49% male respondents with an average age of 52 years. Regarding socio-economic position, the majority of the respondents (58%) is either working full time, working part time or self-employed; the second largest group (29%) is made up of pensioners. Additional descriptive statistics for the unweighted and weighted samples are presented in Appendix 3.

3.2 Measures

In this paper, we put forward two concepts to investigate subjective income sufficiency: the sufficiency level (SL) and the sufficiency evaluation (SE). Both concepts are introduced below together with the measures we have developed to assess them.

3.2.1 Concept and measurement of Sufficiency Level

The concept of sufficiency level (SL) looks into the question: what level of income is considered to be enough? In other words: where do individuals set the sufficiency bar for themselves? The SL concept is measured using the Income Evaluation Question (IEQ) put forward by Van Praag & Ferrer-i-Carbonell (2004). The IEQ that we included in the LEVO survey asks respondents to quote six levels of personal monthly income, each corresponding to a welfare level: 'Given your current situation, which personal monthly net income (in euros) would you consider to be: very bad, bad, insufficient, sufficient, good and very good?'. Note that the question refers to personal income rather than household income since the sufficiency concepts are defined at the individual level. Instead of considering all six levels, we focus on one specific response: the SL is defined as the income level which is quoted at the sufficient level of income.

[2] Respondents who quoted a personal monthly income below the '750 to 1000 euros' income bracket were considered as faulty data and consequently left out of the analysis. The social security system in Belgium provides several types of benefits (e.g. pensions, unemployment benefits, family allowances, allowances in the event of sickness) and – depending on an individual's available income – additional benefits can be obtained from supplementary support systems (i.e. income support, income guarantee for the elderly, guaranteed family allowance and payments for people with a handicap or for help to the elderly). Considering all these forms of social support, we assume non-student adult individuals with papers (i.e. having legal personal identification documents and the language capacity to approach public administration) to be at least entitled to a total net amount of 750 euros per month.

[3] According to the Chi Square Goodness of Fit Tests, the univariate distributions for the weighted sample are equal to the expected ones from the Labour Force Survey 2019 for socio-economic position (p=1.000), gender (p=1.000) and age (p=.986).

3.2.2 Concept and measurement of Sufficiency Evaluation

The concept of sufficiency evaluation (SE) assesses the following: do people consider themselves to have enough with respect to income, and if so, to what degree? To operationalize sufficiency evaluation, we included two alternative measurement methods in the LEVO survey. First, direct sufficiency evaluation (DSE) is measured with the question 'Indicate what fits best: I consider my personal monthly income to be…' and provides six ordinal response options: 'very bad', 'bad', 'insufficient', 'sufficient', 'good' and 'very good'. As such DSE represents the discrete counterpart of the open IEQ. Second, indirect sufficiency evaluation (ISE) builds on the SL concept. Van Praag and Ferrer-i-Carbonell (2004) state that by interpolating a respondent's individual situation with respect to their individual norm, a self-evaluation can be obtained. In this analysis we define ISE as the ratio of an individual's personal monthly income[4] to their SL (in euros). Consequently, a respondent with an ISE value larger than 1 or 100% can be considered to indirectly evaluate their personal monthly income as being at least sufficient. An ISE value equal to 2 indicates a personal monthly income twice as high as the personally defined SL, while an ISE value equal to .5 indicates a personal monthly income that is only half of the personally defined SL[5]. Throughout the remainder of this paper, we will analyse both measures (DSE and ISE) when considering the SE concept.

3.2.3 Determinants

In line with the literature on financial satisfaction (see section 2.2), we include two main groups of variables to explore the determinants of SL and SE: socio-demographic and economic variables. Given the income viewpoint of the analysis, economic variables are of primary importance while socio-demographic variables will mainly serve as control variables. Additionally, the role of personal values is analysed. In what follows, the two key groups of variables of interest (economic variables and personal values) as well as the set of control variables are discussed in detail.

[4] Personal monthly income is measured as an ordinal variable in the LEVO survey: respondents are asked to indicate their personal monthly net income taking into account any benefits, fringe benefits, child benefits, dividends, rental income etc. They are provided with 16 ordinal response categories ranging from 'no income (or lower than 100 euros)' over '100 to 249 euros' to '3500 euros or more' with increments of 250 euros. For further analysis, we define personal monthly income as the median value of the indicated personal monthly income bracket. For example: a respondent who indicates category '750 to 1000 euros' is assigned a personal monthly income of 875 euros.

[5] As the ordinal measurement of personal monthly income provides a limited number of categories, the upper category groups together all respondents with a personal monthly income larger than or equal to 3500 euros and assigns them a median personal monthly income of 3625 euros. Consequently, when such a respondent quotes an SL that exceeds 3625 euros, the calculated ISE value automatically leads to an insufficient evaluation (i.e. an ISE value smaller than 1). However, this calculated ISE value is incorrect and underestimates the true ISE value when such a respondent's true personal monthly income, larger than 3625 euros, in reality exceeds their quoted SL. As a result, the reported ISE value in the remainder of this paper should be interpreted as a lower boundary of the true ISE value. However, the downward bias of the ISE value is limited since only 33 out of 1645 cases (i.e. 2% of the sample) qualify for this potential underestimation.

Economic variables

Given the income perspective of the analysis, economic variables are expected to affect the concepts. Given that the concepts are measured at the individual level, two individual economic variables are included: personal monthly income and homeownership. Concerning the first economic variable, we hypothesize that personal monthly income is positively linked with both the sufficiency evaluation and sufficiency level. The first hypothesis follows from the fact that it can be expected that the higher an individual's income level, the higher the evaluation with respect to that income level will be. The second hypothesis is based on the literature on the individual welfare function of income (WFI): Van Praag et al. (1988) found that the influence of one's personal income on income standards is very strong and positive across all welfare levels. Whereas the link between the subjective income sufficiency concepts and personal monthly income is quite straightforward ('income' is directly referred to in each of the measures), it is more difficult to hypothesize whether and how homeownership relates to the concepts. However, non-homeowners have additional expenses (either rent or mortgage payments) compared with homeowners whose property is fully paid off, which consequently affects the level of personal income that is available for other expenses. Since homeownership affects the level of personal income that is available beyond rent or mortgage payments, similar hypotheses can be formulated as for the first economic variable: we hypothesize that homeownership is positively linked with both the sufficiency evaluation and sufficiency level.

Personal values

We investigate whether and how personal values play a role for subjective income sufficiency. Values are defined as cognitive representations of desirable, abstract goals that motivate actions (Roccas et al., 2002). Personal values and other personality-related characteristics are rarely mentioned in the literature on determinants of financial satisfaction. Fan & Babiarz (2019), for instance, recognize the importance of personality and attitudes in explaining financial satisfaction yet without going into further detail, while Joo & Grable (2004) and Sahi (2013) do not focus on personal values at all. However, Roccas et al. (2002) state that personal values have repeatedly predicted attitudes, behaviours and subjective states in previous literature. Considering the subjective concepts investigated in this paper, two personal values are of particular interest and therefore added to the analysis: materialism and environmental self-identity.

Materialism is expected to be inversely related to subjective income sufficiency. Richins and Dawson (1992) conceptualize materialism as a consumer value and define it as "the importance ascribed to the ownership and acquisition of material goods in achieving major life goals or desired states" (Richins, 2004, p.210). Furthermore, the authors consider three key belief domains (components) that constitute the material values: the centrality of acquisition in a person's life, the role of possessions and their acquisition for subjective well-being (happiness and life satisfaction), and the role of possessions in defining success. Regarding this definition, there seems to be a contradiction between a key element of materialism, i.e. the concept of acquisition, and the notion of sufficiency. Acquisitions entail purchases

which lead to an extension of one's possessions, which in turn is used as a primary criterion for defining well-being and success. In contrast, experiencing sufficiency is about having enough with one's current set of possessions without the need for further expansion. Additionally, previous studies have shown that placing more importance on materialistic goals and values is negatively related to subjective well-being (Burroughs & Rindfleisch, 2002; Kasser et al., 2014) Therefore, we hypothesize that materialistic preferences are inversely linked to subjective income sufficiency assessments in that more materialistic individuals are expected to set the bar (SL) higher and to evaluate their income (SE) lower compared with less materialistic individuals. To measure materialism, we use the short form of the material values scale (MVS) proposed by Richins (2004). This short form consists of nine items, i.e. three items to measure each of the three belief domains (see Table 1), and uses a five-point Likert scale response format ranging from 'totally disagree' (1) to 'totally agree' (5). The mean over the nine items is calculated (taking into account the reverse scaled item) and is used as a measure for materialism.

Next, we want to examine whether an individual's set of beliefs, values and attitudes towards the environment are related to subjective income sufficiency. In this paper, an income perspective has been adopted to operationalize sufficiency. Ecological motivations have deliberately been left out of the definition and measurement of the subjective income sufficiency concepts in order for the analysis to be applicable to the general population rather than focussing on niche movements. However, given the context of sufficiency as a strategy for addressing environmental challenges, it is all the more interesting to investigate how the different sufficiency concepts relate to environmental beliefs, values and attitudes. To this end we make use of the environmental self-identity construct. This construct is defined as "the extent to which you see yourself as a type of person who acts environmentally-friendly" (Van der Werff et al., 2013b, p.56). On the one hand, Van der Werff et al. (2013a; 2013b) find that environmental self-identity is an important antecedent for environmental preferences, intentions and behaviours and that its strengthening can lead to a promotion of pro-environmental actions. On the other hand, the sufficiency strategy can be thought of as a clustering of specific pro-environmental attitudes and behaviours. Consequently, it can be hypothesized that environmental self-identity positively relates to this strategy via its positive contribution to subjective income sufficiency. In other words: we hypothesize that environmental self-identity is positively linked to subjective income sufficiency assessments in that individuals who see themselves more as acting environmentally-friendly are expected to set the bar (SL) lower and to evaluate their income (SE) higher. Following Van der Werff et al. (2013a), we make use of three items to measure environmental self-identity (see Table 1). Similar to the measurement of materialism, a five-point Likert scale response format is used ranging from 'totally disagree' (1) to

'totally agree' (5). The mean over the three items is calculated and used as a measure for environmental self-identity.

Table 1: Items to measure materialism and environmental self-identity

MATERIALISM		
1	I admire people who own expensive homes, cars, and clothes.	success
2	The things I own say a lot about how well I'm doing in life.	
3	I like to own things that impress people.	
4	I try to keep my life simple, as far as possessions are concerned. (R)	centrality
5	Buying things gives me a lot of pleasure.	
6	I like a lot of luxury in my life.	
7	My life would be better if I owned certain things I don't have.	happiness
8	I'd be happier if I could afford to buy more things.	
9	It sometimes bothers me quite a bit that I can't afford to buy all the things I'd like.	
ENVIRONMENTAL SELF-IDENTITY		
1	Acting environmentally-friendly is an important part of who I am.	
2	I am the type of person who acts environmentally-friendly.	
3	I see myself as an environmentally-friendly person.	

(R) denotes a reverse scaled item.

Control variables

Individuals are asked to consider their personal current situation when responding to the sufficiency-related questions. Consequently, it can be expected that individuals use a different frame of reference when answering these questions. We aim to take these differences into account in the analysis by including control variables. More specifically, we control for the following socio-demographic variables: age, gender, number of children living at home, relationship/cohabitation (including a distinction between cohabiting partners with and without income), educational level and socio-economic position. This selection of variables is consistent with the literature on determinants of financial satisfaction. Additional control variables are six personality traits (based on de Vries et al.'s (2009) HEXACO model of personality) and the wave of data collection.

3.3 Analysis

To map subjective income sufficiency, we calculated descriptive statistics for the each of the subjective income sufficiency concepts. Next, to explore the determinants of each of the concepts we performed regression analyses. The SL concept is measured at the ratio level and therefore is analysed by linear regression (OLS). For the SE concept, DSE and ISE are measured respectively at the ordinal and ratio level and are equally analysed by OLS regression. For each of the three measures, the OLS model

includes the two key groups of variables of interest (economic variables and personal values) as well as the set of control variables. All results presented and discussed in the following sections are based on the weighted sample (N=1645).

4. Results

4.1 Descriptive statistics

In this section we present descriptive statistics for each of the three subjective income sufficiency measures. Regarding the personal income level considered as being sufficient, respondents report a wide range of sufficiency levels (SL) with a minimum as low as 650 and a maximum as high as 6000 euros (

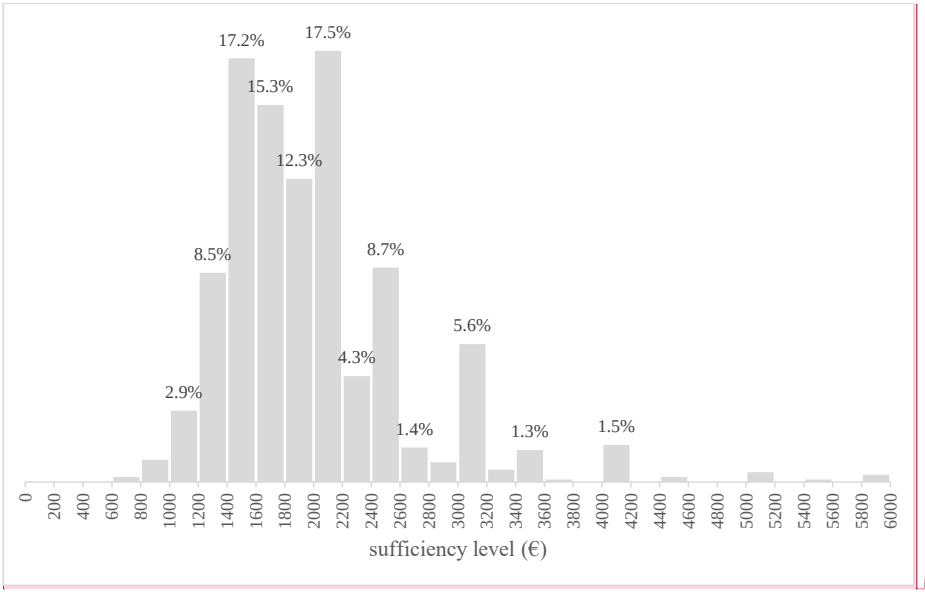
Figure 1). We find that the majority of respondents (62.3%) quote an SL between 1400 and 2200 euros. With respect to the extrema, only 1.1% and 4.4% of respondents quote an SL of respectively less than 1000 euros and more than 3200 euros. Regarding sufficiency evaluations (

Figure 2 and Figure 3), the results of both the direct (DSE) and indirect measure (ISE) indicate that the majority of respondents experience sufficiency: respectively 83.1% and 62.5% of the respondents regard their income levels to be at least sufficient. We also find that the direct measurement method leads on average to a higher sufficiency evaluation than the indirect measurement method. Results for DSE further indicate that 'sufficient' and 'good' are selected most by the respondents (respectively 38.8% and 35.5%) and that only a small fraction of respondents (3.2%) seem to experience their personal monthly income as (very) bad. The results for ISE show a large variation across respondents: while more than half of respondents (52.4%) have a personal monthly income that exceeds their sufficiency level with up to 50% (i.e. an ISE value between 1 and 1.5), more than one in three respondents (35.8%) report personal monthly incomes that fall up to 50% below their sufficiency level (i.e. an ISE value between 0.5 and 1). We also find that only a minority of respondents experience extreme positive or negative levels of indirect sufficiency: respectively 1.7% and 2.4% of respondents report to have personal monthly income levels that are less than half of, or at least twice as high as, their sufficiency levels.[6]

[6] The calculation of the ISE measure is based on the median value of the personal monthly income bracket. As a robustness check, we include descriptive statistics of the ISE measure when it is calculated with (a) the lower bound value and (b) the upper bound value of the personal monthly income bracket (see Appendix 4 Table A and Table B).

Figure 1: Histogram (relative frequencies) of sufficiency level (SL) (N=1645)

M = 1950.53 SD = 678.97 Min = 650.00 Max = 6000.00



Met opmerkingen [DC1]: this figure has been adjusted (x-axis): rather than reporting border values for each category (e.g. [1600;1800[), border values (tick marks between categories) are reported.

Remark: the relative frequency of a category is not explicitly displayed when the value is smaller than 1%.

Figure 2: Histogram (relative frequencies) of ~~d~~Direct sufficiency evaluation (DSE) (N=1645)

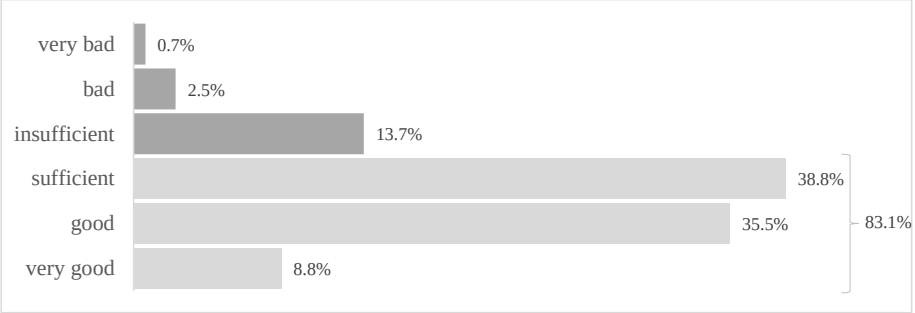
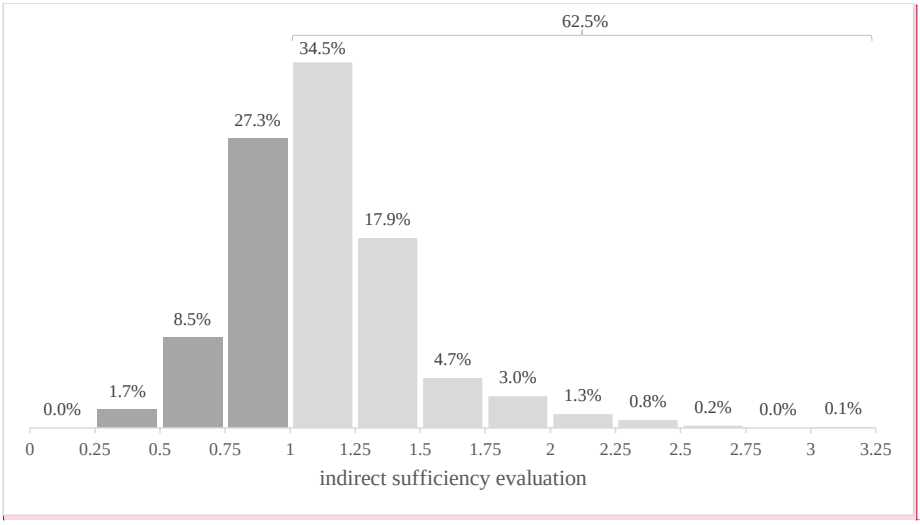


Figure 3: Histogram (relative frequencies) of ~~i~~Indirect sufficiency evaluation (ISE) (N=1645)

M = 1.11 SD = 0.34 Min = 0.23 Max = 3.02



Met opmerkingen [DC2]: this figure has been adjusted (x-axis): rather than reporting border values for each category (e.g. [1600;1800[), border values (tick marks between categories) are reported.

4.2 Regression analysis

4.2.1 Individual analysis per concept

Table 2 presents the results of the linear regression models for the SL concept as well as for the DSE and ISE measures.

Table 2: Linear regression analysis (OLS) with sufficiency level (SL), direct sufficiency evaluation (DSE) and indirect sufficiency evaluation (ISE) as dependent variables (N=1645)

CONCEPT		Sufficiency Level SL		Sufficiency Evaluation DSE		ISE	
COEFFICIENT		B	β	B	β	B	β
Economic variables							
Personal monthly income (in thousands of euros)		488.790***	0.579	0.610***	0.517	0.265***	0.632
Homeownership	Non-homeowner	-	-	-	-	-	-
	Homeowner (ongoing mortgage payments)	37.651	0.025	0.084	0.040	-0.012	-0.016
	Homeowner (full ownership)	-18.491	-0.014	0.202***	0.106	0.022	0.032
Personal values							
Materialism		82.210***	0.076	-0.153***	-0.101	-0.046***	-0.085
Environmental self-identity		43.366**	0.053	-0.007	-0.006	-0.023**	-0.055
Socio-demographic variables							
Age		5.143***	0.127	-0.002	-0.044	-0.003***	-0.142
Gender	Male	-	-	-	-	-	-
	Female	-30.271	-0.022	0.022	0.012	0.008	0.012
Number of children living at home	No children	-	-	-	-	-	-
	1 child	-26.442	-0.015	-0.134*	-0.054	-0.000	0.000
	2 children	84.790*	0.054	-0.134*	-0.061	-0.053**	-0.067
	>=3 children	35.778	0.016	-0.273***	-0.086	-0.026	-0.023
Relationship/cohabitation	No relationship	-	-	-	-	-	-
	Relationship (not living together)	155.176***	0.065	-0.024	-0.007	-0.077***	-0.065
	Relationship (living together, partner has no income)	185.632**	0.057	-0.148	-0.032	-0.082*	-0.050
	Relationship (living together, partner has income)	88.855***	0.062	0.164***	0.082	-0.038**	-0.054
Education	Medium educated	-	-	-	-	-	-
	Lower educated	17.144	0.011	-0.040	-0.018	-0.019	-0.024
	Higher educated	-16.994	-0.012	0.094*	0.049	-0.001	-0.002
Socio-economic situation	Employed	-	-	-	-	-	-
	Pensioner	-106.582	-0.071	-0.141	-0.068	0.067*	0.090
	Unemployed	118.752**	0.032	-0.702***	-0.135	-0.077***	-0.042
	Incapable to work	16.159	0.005	-0.332***	-0.079	-0.013	-0.009
	Househusband/wife	-51.005	-0.014	0.104	0.021	-0.019	-0.011
Personality traits							
Extraversion		-18.653*	-0.043	0.020	0.033	0.008	0.035
Tolerance		2.045	0.005	0.007	0.011	0.000	0.002
Emotionality		5.497	0.012	-0.036**	-0.056	-0.000	-0.002
Conscientiousness		18.435*	0.039	0.024	0.036	-0.007	-0.028
Openness to experience		7.580	0.016	0.008	0.012	-0.006	-0.025
Integrity		-13.416	-0.024	0.010	0.012	0.008	0.028
Wave		28.254	0.021	-0.031	-0.016	-0.007	-0.010
Constant		250.386*	.	3.416***	.	0.906***	.
R^2		0.397		0.443		0.396	
N		1645		1645		1645	

, ** and * indicate significance at the 10, 5 and 1% level. Both unstandardized (B) and standardized (β) coefficients are shown. Reference group: men owning no house, having no children, having no relationship, averagely educated and employed (either full-time, part-time or self-employed).*

Regarding the analysis of the sufficiency level (columns 1 and 2 in Table 2), the OLS model reveals that personal monthly income has a strong positive effect: on average a higher personal income corresponds to a higher self-reported sufficiency level. This is in line with empirical findings from the literature on the individual welfare function of income (WFI) and supports our hypotheses. In contrast, we find that homeownership does not significantly affect the self-reported sufficiency level. Next, we find that both personal values are significant, albeit with relatively low levels of significance and small sizes for the standardized coefficients. First, materialism is found to be positively associated with sufficiency levels: individuals who are more materialistic quote on average a higher sufficiency level. This finding is consistent with our hypotheses. Second, we find that environmental self-identity is also positively associated with sufficiency levels: individuals who see themselves more as acting environmentally-friendly quote on average higher levels of income for the sufficiency threshold. This is not in line with our hypotheses.

Turning to the control variables, we find that being older, having a relationship and being unemployed (compared to being employed) correspond on average to a higher quoted sufficiency level. The finding that the sufficiency level increases with age might be attributed to changes in wage expectations. For example, Becker (2021) and Duarte et al. (2021) found a positive correlation between age and salary expectations. Furthermore, individuals who have a relationship probably use a different frame of reference when answering the sufficiency-related questions: they might bear in mind sustaining two individuals instead of one. In this respect, it makes sense that individuals who live together with a non-income-earning partner quote an even higher sufficiency level compared with individuals who live together with an income-earning partner. Finally, the sufficiency level is positively affected by having children (compared to having no children), being less extraverted and being more conscientious, yet these effects are found to be only marginally significant ($p>.05$).

Regarding the analysis of sufficiency evaluation (columns 3 to 6 in Table 2), we find that personal monthly income again plays a key role: having a higher personal income level corresponds on average to a higher self-reported level of DSE and a higher ISE score. Furthermore, we find that homeownership matters only for the direct measure: individuals who own a property that is fully paid off evaluate on average their income as more sufficient than non-homeowners. These findings are consistent with our hypotheses. In contrast, no such homeownership relation is found for the indirect measure. Subsequently, the results for the personal values are analysed. The models reveal that being more materialistic corresponds on average to a lower sufficiency evaluation. This finding holds for both the direct and indirect measure and is in line with our expectations. In contradiction with our hypotheses, we find that environmental self-identity negatively relates to the indirect measure: individuals who see themselves more as acting environmentally-friendly have on average a lower ISE score. No such effect is found for the direct measure.

Next, we find that both measures are on average negatively associated with having children and being unemployed. In contrast, relationship status has opposing effects for both measures: while having a relationship corresponds on average to a lower ISE score, individuals who live together with an income-earning partner (compared to single individuals) report higher DSE. This latter finding suggests that partner income seems to play a role in sufficiency evaluations. The results further indicate that being incapable to work and being more emotional correspond on average to a lower DSE, while being older corresponds to a lower ISE sore. Finally, being higher educated and being retired correspond on average to a higher DSE and ISE score respectively, albeit to a marginal extent ($p>.05$).

4.2.2 Robustness checks

We test the robustness of our findings for three elements.

First, we check whether results change if the ordinal DSE measure is analysed using ordinal logistic regression instead of linear regression. Appendix 4 (Table C) shows the results of the ordinal logistic regression analysis. The results for both models (linear and ordinal) are similar: coefficients for the economic variables and personal values have the same sign and level of significance. Besides minor changes in significance for the coefficients of number of children, education and conscientiousness (one of the personality traits), the same findings hold for all other variables in both models.

Second, we analyse whether results are affected by the potential downward bias of the ISE value (cfr. footnote 5). Towards this end, two checks (exclusion and adjustment) are performed. In a first check, the three OLS models are re-estimated after excluding 33 respondents from the sample with a potentially faulty ISE value (N=1612). The results presented in Appendix 4 (Table D) illustrate that findings for the SL concept are slightly affected: compared with the original full-sample analysis (presented in Table 2), less determinants are significant (e.g. environmental self-identity, having two children, being unemployed and extraversion are no longer significant). The lower number of significant determinants can be explained by the fact that the 33 respondents that are left out of the analysis quote relatively high values for SL. Consequently, the variation in the dependent variable in the new analysis is reduced compared with the original full-sample analysis. However, the sign and significance of the coefficients for the main explanatory variables of the SL concept (i.e. personal monthly income, age and materialism) remain unchanged. Findings for both sufficiency evaluation measures, on the other hand, are largely unchanged altogether. In a second check, the OLS model for the ISE measure is re-estimated after adjusting the ISE value for the 33 respondents with a potential downwards bias to the value 1 (N=1645). Appendix 4 (Table E) show that the results are barely affected: all coefficients retain the same sign and level of significance.

Third, we check whether results are affected when the lower boundary for personal monthly income is lowered from '750 to 1000 euros' to '500 to 750 euros' (cfr. footnote 2), expanding the sample with 29 respondents (N=1674). The results of this robustness check are presented in Appendix 4 (Table F) and

show little to no divergences from the original analyses: for all three measures, the signs and levels of significance of all coefficients remain unchanged or are only marginally changed.

5. Discussion

We elaborate further on the relationship between the three measures analysed in section 4.2.1. Despite being measures for one and the same concept (sufficiency evaluation), ~~our~~ findings for DSE and ISE are not always aligned: ~~ in that we find~~ different determinants ~~to be~~ are significant in both models, and sometimes variables are ~~found to be~~ associated to SE in opposing ways. This deviation might be explained by the difference in measure construction. The DSE measure asks respondents directly to evaluate their personal income. In contrast, the ISE measure is constructed by combining responses for two separate questions: personal income (a rather objective question) and the sufficiency level, i.e. one of the six levels quoted in the IEQ (a subjective question). In asking respondents to quote a set of six values at once, the IEQ is a cognitively demanding task, and the way respondents answer this question is unclear. For example, it is uncertain in what order the levels are quoted: a respondent might quote the levels ~~might be quoted~~ in ascending or descending order, or ~~a respondent~~ might choose to define the 'sufficient' or 'good' level first. Furthermore, we cannot know whether respondents devote the same amount of consideration in defining each level: the level that is defined first might receive most attention, as it will serve as a benchmark in defining the other levels. Altogether, it is difficult to know what elements are (not) at play when respondents quote the 'sufficient' level in the IEQ and – by extension – what elements are (not) reflected in the ISE. As a consequence, it is even more difficult to analyze whether the determinants for both sufficiency evaluation measures are aligned. Additionally, ~~note that~~ coefficients for most variables in the OLS models for SL and ISE are similar in level of significance but opposite in sign. This follows logically from the definition of the ISE measure (SL appears in the denominator of ISE).

Next, we discuss in more detail the regression results in light of the hypotheses that were formulated in section 3.2.3 regarding the economic variables (income and homeownership) and personal values (materialism and environmental self-identity). For the economic variables, we find that our hypotheses are largely confirmed: personal income and homeownership relate positively to both subjective income sufficiency concepts. This dependence of the sufficiency level on the level of income itself denotes preference drift: income aspirations or – in this case specifically – the level of income that is deemed to be sufficient, shifts with the income level actually attained. Consequently, our results are in line with findings from the literature on welfare economics (e.g. Van Praag, 1971). Furthermore, the importance of income and homeownership for sufficiency evaluation is in line with findings from the literature on the determinants of financial satisfaction (Fan & Babiarz, 2019; Joo & Grable, 2004; Sahi, 2013). ~~Remark that the~~The relationship between personal income and experienced sufficiency is ambiguous:

an individual with a higher level of income quotes a higher sufficiency level (negative sufficiency experience) yet also experiences higher levels of sufficiency evaluation (positive sufficiency experience). Regarding materialism, findings are consistent with our expectations: being more materialistic relates positively to the quoted sufficiency level and negatively to both measures for sufficiency evaluation. This is in line with previous literature where materialism is found to negatively affect another subjective evaluation of an individual's state: subjective well-being (Burroughs & Rindfleisch, 2002; Kasser et al., 2014). Consequently, the relationship between materialism and experienced sufficiency is negative. Findings for environmental self-identity, however, are ~~somewhat~~ unanticipated. The expected positive relation between environmental attitudes and experienced sufficiency is not observed: on the contrary, the results suggest the relation is negative, i.e. that seeing oneself more as a type of person who acts environmentally-friendly corresponds with a higher quoted sufficiency level and a lower indirect sufficiency evaluation. This finding leads to a rejection of the hypothesis that environmental self-identity relates positively to (support for) sufficiency strategies via its positive contribution to subjective income sufficiency. A possible explanation for this counterintuitive finding ~~can be~~relates ~~related~~ to the specific measure used in this analysis, i.e. environmental self-identity. This measure is not necessarily indicative of the degree to which individuals consider reducing their consumption levels. Van der Werff et al. (2013a; 2013b) and Whitmarsh & O'Neill (2010) explore the positive relationship between environmental self-identity and environmental behaviour through multiple studies. Across these studies diverse indictors are used to measure environmental behaviour, including: intention to use green energy, intention to reduce energy use, product preferences (choice between a more and a less sustainable option differing in price), factual data on energy-related behaviours (meat consumption, showering time, driving style) and flying behaviours. While all these behaviours can be considered as environmental, not all these behaviours necessarily entail a reduction of consumption levels and hence can be considered as proposals related to the sufficiency strategy. Consequently, individuals with a higher level of environmental self-identity might adopt more environmental behaviours that imply an alteration of consumption (towards more sustainable alternatives) rather than a reduction of consumption. Additionally, sustainable choices are often more expensive than less sustainable alternatives (e.g. travelling by train versus airplane (Otero & Ringertz, 2022), high price premium of organic food (Hughner et al., 2007) and of sustainable fashion versus fast fashion (Henninger et al., 2016)). This could explain why individuals with a higher level of environmental self-identity on average quote a higher sufficiency level (SL): to the degree that more sustainable consumption is (perceived as being) more expensive, these individuals might require more income to finance these sustainable choices, which not necessarily entail a reduction of consumption.

The counterintuitive finding on environmental self-identity raises questions regarding the relationship between the experience of income sufficiency on the one hand and (openness towards) sufficiency strategies on the other. While we would expect the relation to be positive, this assumption is still to be

proven. This assumption can be investigated – to a limited extent – ~~by means of~~with another question in the LEVO dataset. More specifically, a question is included that allows to estimate individual preferences for a working-time reduction, i.e. a reduction of the total amount of paid working time over the life course (Pullinger, 2014). This can be considered as an emblematic post-growth policy. Respondents that were employed at the time of the survey were asked whether they would prefer either two additional annual leave days (additional leisure) or a 1% increase of their annual wage (additional income). This question can be regarded as a working-time reduction strategy that is (a) at the margin – i.e. additional leave days instead of a reduction of weekly working hours, and (b) an individual choice – i.e. only affecting personal working time instead of proposing a working-time reduction at the societal level. We found that respondents that opted for additional leisure reported on average higher levels of income sufficiency (lower sufficiency levels and higher sufficiency evaluations), yet the differences between both groups were ~~found to be~~ insignificant[7]. While these findings seem to suggest there is no direct relation between income sufficiency and support for sufficiency strategies, they should be interpreted with caution. First, bivariate analyses provide high-level first insights only: extensive regression analyses including a set of relevant control variables (beyond sufficiency-related measures) would be more suitable for explaining openness towards sufficiency strategies. Many other factors are at play when making this choice for additional leisure or income, such as the ability of respondents to effectively take up leave days (may be restricted due to high workload or a large amount of outstanding leave days), the ability to pass on tasks to colleagues while being on holiday, the quality of the (additional) time off, etc. (Gerold & Nocker, 2018). Moreover, we focused on a single sufficiency proposal (working-time reduction) which is applicable only to a subgroup of the population (employed people). Future research should explore the relation between income sufficiency and support for other sufficiency policies, either at the individual level (e.g. adoption of sustainable lifestyles related to mobility, dietary pattern, clothing, construction etc.) or at the societal level, moving away more radically from the status quo (e.g. a collective working-time reduction). Beyond these considerations, a possible explanation for the lack of relationship may be ~~found in~~ the different level of abstraction: strategies related to sufficiency may be interpreted rather as high-level, abstract concepts and therefore may be further away from the down-to-earth, concrete experience of income sufficiency than initially expected.

Finally we frame our results in the context of the environmental debate. An interesting finding of this study is that in general, sufficiency is experienced in society: a strong majority of individuals consider their income to be at least sufficient. This is especially interesting to the extent that it would imply a broader social support for sufficiency strategies. To further discuss implications, we assume – based on

[7] New weights were calculated for the subsample of working respondents (N=917) to be representative for the Flemish working population for gender and age. To compare the average sufficiency level between the leisure group and income group, a two-sample t-test was performed (p=.452). To compare the proportion of respondents regarding their income to be at least sufficient (sufficiency evaluation) between both groups, a two-sample test of proportions was performed both for direct measure (p=.229) and the indirect measure (p=.404).

the discussion in the previous section – that high levels of direct sufficiency evaluation go hand in hand with more support for much needed sufficiency strategies. Under this assumption our findings suggest that individuals who are richer, own a property that is fully paid off and who are less materialistic are more open towards sufficiency proposals. These findings are promising: ~~ in that~~ they support the argument that richer communities and countries should take the lead in reducing (over)consumption (e.g. by means of sufficiency proposals), leaving more room for needed growth to poorer communities and countries. At the same time, these findings are worrying: ~~in that~~ richer communities and countries are often characterized by high levels of consumerism and materialism, which lowers openness towards sufficiency proposals. However, as the effect of materialism is considerably smaller than the effect of income (see standardized coefficients in Table 2) the net result is expected to be favourable: on average, higher levels of sufficiency are experienced in richer communities and countries.

6. Conclusion

In order to achieve environmental sustainability, the need to complement the dominant technological strategy (i.e. pursuing efficiency gains) with a sufficiency strategy (i.e. reducing consumption) is increasingly being recognised. However, little research has been devoted to empirically investigating to what extent individuals actually experience sufficiency or think that they have 'enough'. Especially in industrialized countries, basic human needs have been exceeded (by far) and the literature on happiness economics has shown that increases in consumption do not necessarily lead to increases in subjective well-being. Consequently, one can expect that a certain level of sufficiency is being experienced in contemporary society.

This study sought to shed light on how sufficiency is subjectively being experienced in Belgium from an income point of view using two concepts. First, we looked into the sufficiency level of individuals – the level of personal monthly income that is deemed to be sufficient. Here we find that the respondents to our survey report a wide range of sufficiency levels, with a majority of them quoting values between 1400 and 2200 euros. Second, we explored to what extent our respondents think that their personal monthly net income is sufficient (sufficiency evaluation), and this by using both a direct question and an indirect measure comparing actual income levels to the reported sufficiency level. The results for both measures indicate that the majority of individuals consider their income to be at least sufficient with only a minor fraction labelling their income as (very) bad. However, results vary according to the measurement method: on average, the direct method leads to a higher sufficiency evaluation than the indirect method.

Next, we exploratively investigated the determinants of subjective income sufficiency using regression analysis with a specific focus on two groups of determinants: economic variables (income and homeownership) and personal values (materialism and environmental self-identity). Our results for the

regression analyses show that on average, the quoted sufficiency level is higher for individuals who have a higher personal income, are more materialistic and see themselves more as a type of person that acts environmentally-friendly. The finding that environmental self-perception relates positively with perceptions on how much income is considered to be enough, resonates well with the literature on green growth: as sustainable choices are often (considered to be) more expensive, individuals might require higher income levels to finance a sustainable lifestyle. In this respect, the identified relationship supports the common imaginary that environmentalism equates with sustainable consumption. Turning to sufficiency evaluation, we find that results for both measures are not fully aligned with each other and this potentially due to differences in the construction of the measures. Our findings suggest that having a higher personal income and being less materialistic correspond on average to higher sufficiency evaluations, and this according to both the direct and indirect measures. Furthermore, we find that owning a property that is fully paid off leads to a higher direct sufficiency evaluation (compared to non-homeowners), while seeing oneself more as a type of person who acts environmentally-friendly leads to a lower indirect sufficiency evaluation. Considering all three measures together, we reflect on their reliability and robustness. Whereas the two sufficiency evaluation measures provide results that are not always aligned with each other and hence more difficult to interpret, results for the sufficiency level resonate well with the literature on materialism, welfare economics and financial satisfaction. This leads us to conclude that the sufficiency level is the more robust and reliable measure.

Our study is limited in a number of ways. First, we make use of self-reported data on monthly income that can be flawed, especially since the income data was collected using an ordinal scale (income brackets). As a result, we adopt median values for each of the income brackets when compiling the indirect sufficiency measure, and this is to some extent problematic (i.e. for respondents who indicate the highest response category for personal monthly income). Second, the generalizability of the results towards the Flemish population should be treated with caution since the weighting procedure is based on extrapolated data from the Labour Force Survey 2019. A third limitation of the study relates to the methodology used to address the second research question, i.e. the explorative investigation of determinants: regression analysis does not allow to establish causal relationships between independent and dependent variables. Consequently, our results should be interpreted as conditional correlations. Finally, the results based on the IEQ question module should be interpreted with caution. As respondents are encouraged to use their personal frame of reference ('given your current situation') when formulating a response, the question is open to broad interpretations. We aim to take the different circumstances that respondents are facing into account in the analysis by including a set of control variables. However, the set of control variables that we use might miss out on other relevant determinants related to sufficiency (e.g. health status, spirituality).

We finalize by suggesting some opportunities for future research. Since questions relating to 'how much is enough' require context, we decided to address the topic of subjective sufficiency from an income perspective in this analysis. Further research could explore whether and how individuals experience subjective sufficiency using other perspectives as well as investigate how these perspectives relate to one another. While we chose the income perspective to specify the question 'enough of what', we deliberately decided to leave the question 'enough for what' open (e.g. 'enough to live a good life', 'enough to be happy'). Consequently, interpretations across respondents might be quite diverging, adding to the subjectivity of the question and making interpersonal comparability questionable. Further research could investigate how findings on subjective sufficiency change when 'enough for what' is specified in greater detail. Additionally, the primary focus of this study was to provide a first step in the empirical conceptualization, measurement and exploration of subjective sufficiency. A fruitful area for further research would be the analysis of how subjective sufficiency relates to other key constructs such as life satisfaction or to specific proposals related to the sufficiency strategy such as working-time reduction (cfr. section 5). Insofar as high levels of experienced sufficiency would translate into a broad social support for sufficiency strategies, our findings are encouraging: they may suggest that society is ready to explore new policy pathways towards environmental sustainability that are designed around the concept of sufficiency.

Appendices

Appendix 1: Variants of the Income Evaluation Question (IEQ) throughout the literature

PAPER	WELFARE LEVELS	QUESTION
Van Praag & Ferrer-i-Carbonell (2004)	6	Given your present household circumstances, what monthly household-income level would you consider to be: - a very bad income: (…) - a bad income: (…) - an insufficient income: (…) - a sufficient income: (…) - a good income: (…) - a very good income: (…)
Ferrer-i-Carbonell & Van Praag (2001)	5	Assuming prices to be constant, what monthly income (net of taxes) would you consider for your household as: - very bad: (…) - bad: (…) - not bad not good: (…) - good: (…) - very good: (…)
Van den Bosch (1996)	6	In the circumstances of your household, which monthly disposable income would you regard as: - very bad: (…) - bad: (…) - insufficient: (…) - sufficient: (…) - good: (…) - very good: (…)
Garner et al. (1996)	6	Which after-tax monthly income would you, in your circumstances consider to be: - very bad: (…) - bad: (…) - insufficient: (…) - sufficient: (…) - good: (…) - very good: (…)
Van Praag (1971)	10	Taking into consideration his working conditions and his family situation, the head of the family would tend to consider his net annual income (i.e. after deduction of taxes and social charges) as: - excellent if it exceeds (…) - good if it is situated between (…) and (…) - largely sufficient if it (…) is situated between (…) and (…) - sufficient if it (…) is situated between (…) and (…) - barely sufficient if it (…) is situated between (…) and (…) - barely insufficient if it (…) is situated between (…) and (…) - insufficient if it (…) is situated between (…) and (…) - largely insufficient if it (…) is situated between (…) and (…) - bad if it (…) is situated between (…) and (…) - very bad if it (…) is situated between (…) and (…)

Appendix 2: Three key categories of sufficiency-related concepts in the economic literature

A. INCOME SUFFICIENCY						
PAPER	TERM	NUMBER OF ITEMS	QUESTION	MEASUREMENT LEVEL	RESPONSE OPTIONS	
Anderzén et al. (2020)	Perceived income (in)sufficiency	1	*Variable measuring the perceived sufficiency of income for basic needs**	ordinal	1 2 3	not sufficient more or less sufficient sufficient
Tarasenko & Schoenberg (2017)	Self-perceived income sufficiency	1	Which of the following best describes your current financial status?	ordinal	1 2 3 X	you have more than you need to live well you have just about enough to get by (3) you sometimes struggle to make ends meet Don't know / prefer not to say
El Ansari & Haghgoo (2014)	Income sufficiency	1	How sufficient do you consider the amount of money that you have at your disposal? *	ordinal	1 2 3 4	always sufficient mostly sufficient mostly insufficient always insufficient
Abraham & Gunawan (2014)	Income sufficiency	10	How far do you feel satisfied with the following aspects of compensation that you receive from your work *: (1) basic salary; (2) performance bonus; (3) allowance; (4) health benefits; (5) holiday allowance; (6) transportation allowance (fuels and vehicles); (7) consumption; (8) overtime payment; (9) "the 13th month" salary; (10) incidental income (from project, etc.)	ordinal (6-point scale)	1 … 6	highly insufficient highly sufficient
Bento & Lebrão (2013)	Perceived income sufficiency Self-perception of income sufficiency	1	Do you consider that you have enough money to cover your daily living needs? *(translated from Portuguese (language of the original paper) to English with the help of Google Translate)*	binary	1 2	yes no
Gori-Maia (2013)	Income sufficiency Self-reported perception of income sufficiency	1	In your opinion, your total family income allows you to sustain your life until the end of the month with: (…)	ordinal	1 2 3 4 5 6	great difficulty difficulty some difficulty some ease ease great ease
Mikolajczyk et al. (2008)	Peceived income sufficiency	1	How sufficient do you consider the amount of money remaining on a monthly basis after paying rent? *	ordinal	1 2 3 4	totally sufficient sufficient rather not sufficient not sufficient at all
Witt & Wilson (1990)	Sufficiency of monthly income	1	"My income is sufficient to meet my monthly expenses."	**	**	**

B. PERCEIVED INCOME ADEQUACY

PAPER	TERM	NUMBER OF ITEMS	QUESTION	MEASUREMENT LEVEL	RESPONSE OPTIONS
Gildner et al. (2019)	Perceived income adequacy	1	Do you have enough money to meet your needs? *	ordinal, recoded into binary	1 completely (income secure) 2 mostly (income secure) 3 moderately (income insecure) 4 a little (income insecure) 5 not at all (income insecure)
Jatrana & Chan (2017)	Income adequacy Adequacy of income Perceived income Perception of income adequacy	1	*Variable measuring whether respondents report their income as adequate or inadequate* *	binary	1 yes 2 no
Pereira & Coelho (2013)	Perceived income adequacy	1	Which of the descriptions on this card comes closest to how you feel about your household income nowadays?	ordinal	1 living comfortably on present income 2 coping on present income 3 finding it difficult on present income 4 finding it very difficult on present income
Grable et al. (2013)	Perceived income adequacy Subjective evaluation of income adequacy	1	To what extent do you think your income is enough for you to live on?	ordinal	1 not at all adequate 2 can meet necessities only 3 can afford some of the things I want but not all I want 4 can afford about everything I want 5 can afford about everything I want and still have enough money left over
Litwin & Sapir (2009)	Perceived income adequacy Perceptions of income adequacy	1	Thinking of your household's total monthly income, would you say that your household is able to make ends meet?	ordinal (4-point scale), recoded into binary	1 with great difficulty … 4 easily
Matthews et al. (2005)	Self-perceived adequacy of income Self-perceived difficulty managing on income	1	Do you find this adequate or is it difficult to manage on that income?	binary	1 income adequate 2 income not adequate
Stoller & Stoller (2003)	Perceived income adequacy Perceived financial adequacy	2	1. How well does the amount of money take care of your needs?	ordinal	1 very well 2 well 3 poorly
			2. Do you usually have enough money to take care of those little extras?	ordinal	1 yes, we can buy pretty much what we want 2 yes, we can usually afford most ofwhat we want 3 sometimes, but we have to watch our budget carefully 4 no, we can not affordanything extra
Draughn et al. (1994)	Financial adequacy	1	Which of the following four statements describes your ability to get along on your income?	ordinal	1 I can't make ends meet 2 I have just enough, no more 3 I have enough, with a little extra sometimes 4 I always have money left over

C. FINANCIAL SATISFACTION

PAPER	TERM	NUMBER OF ITEMS	QUESTION	MEASUREMENT LEVEL	RESPONSE OPTIONS
Ermiş-Mert (2020)	Income satisfaction	1	Are you content (satisfied) with your income?	ordinal	1 very unsatisfied 2 unsatisfied 3 neutral / neither satisfied nor dissatisfied 4 satisfied 5 very satisfied
DePianto (2011); Hastings (2019)	Financial satisfaction	1	So far as you and your family are concerned, would you say that you are (…) with your present financial situation? *(= General Social Survey measure 'SATFIN')*	ordinal	1 pretty well satisfied 2 more or less satisfied 3 not satisfied at all X Don't know
Xiao et al. (2014); Fan & Babiarz (2019)	Financial satisfaction	1	Overall, thinking of your assets, debts and savings, how satisfied are you with your current personal financial condition?	ordinal (10-point scale)	1 not at all satisfied … 10 extremely satisfied
Joshanloo (2018)	Household income satisfaction	1	Which one of these phrases comes closest to your own feelings bout your household's income these days?	ordinal	1 Living comfortably on present income 2 Getting by on present income 3 Finding it difficult on present income 4 Finding it very difficult on present income
Sahi (2013)	Financial satisfaction	8	*8 items are included to measure financial status: (1) funds for retirement/children education/investment for future; (2) saving; (3) present level income; (4) money for basic necessities; (5) ability to plan for tax saving; (6) ability to plan taking into consideration the inflation; (7) loan amount; (8) family emergencies*	ordinal (5-point Likert scale)	** **
Grable et al. (2013)	Financial satisfaction	1	How satisfied are you with your overall financial situation? *	ordinal (10-point scale)	1 dissatisfied … 10 satisfied
Hansen et al. (2008)	Financial satisfaction	1	How would you describe your present financial situation?	ordinal	1 great financial difficulties 2 some problems 3 must be careful, but I get by 4 good 5 very good
D'Ambrosio & Frick (2007)	Income satisfaction Satisfaction with income	1	*Variable measuring satisfaction with income*	ordinal (11-point scale)	0 completely dissatisfied … 10 completely satisfied
Vera-Toscano et al. (2006)	Financial satisfaction	1	How do you feel about your current financial situation?	ordinal (7-point scale)	1 very unhappy … 7 very happy
Joo & Grable (2004)	Financial satisfaction	1	How satisfied are you with your present financial situation? *	ordinal (10-point scale)	1 ** … 10 **
Crawford Solberg et al. (2002)	Satisfaction with income	8	I am satisfied with: (1) the travel I can afford; (2) the entertainment I can afford; (3) my physical dwelling (house, apartment, dorm, etc.) at the University; (4) the transportation I can afford; (5) the food & drink I can afford; (6) the clothes I can afford; (7) the medical care that I can afford; (8) the money I have to pay school expenses	ordinal (7-point scale)	1 strongly disagree … 7 strongly agree
Ferrer-i-Carbonell & Van Praag (2001)	Subjective financial satisfaction	1	How satisfied are you with the financial situation of your family?	ordinal (11-point scale)	0 not at all satisfied … 10 very satisfied

** In the paper, the question formulation is paraphrased rather than explicitly mentioned*

*** In the paper, the response options are not explicitly mentioned*

Appendix 3: Descriptive statistics

A. Sample characteristics of categorical variables (N=1645)

VARIABLE		n (unweighted)	% (weighted)
Economic variables			
Homeownership			
	Non-homeowner	335	19.01%
	Homeowner (ongoing mortgage payments)	484	29.62%
	Homeowner (full ownership)	826	51.38%
Socio-demographic variables			
Gender			
	Male	821	49.44%
	Female	824	50.56%
Number of children living at home			
	No children	738	48.14%
	1 child	313	17.41%
	2 children	434	24.52%
	>=3 children	160	9.93%
Relationship/cohabitation			
	No relationship	360	21.59%
	Relationship (not living together)	165	8.98%
	Relationship (living together, partner has no income)*	72	4.47%
	Relationship (living together, partner has income)*	1048	64.96%
Education**			
	Lower educated	347	23.49%
	Medium educated	583	35.12%
	Higher educated	715	41.39%
Socio-economic situation			
	Employed	992	58.05%
	Pensioner	344	29.24%
	Unemployed	77	3.46%
	Incapable to work	203	5.45%
	Househusband/wife	29	3.80%
Wave			
	April	719	42.39%
	November	926	57.61%

Sample characteristics are presented for the unweighted sample and the weighted sample (to achieve similarity to the frequency distributions in the Flemish populations for socio-economic position, gender and age).

** The cohabiting partner is defined to have an income if he or she earns an income of at least 100 euros.*

*** 'Lower educated' refers to lower (secondary) education, 'medium educated' refers to higher secondary education, 'higher educated' refers to bachelor, master and postgraduate education.*

B. Sample characteristics of continuous variables (N=1645)

VARIABLE	M (unweighted)	M (weighted)	SD (weighted)	Min	Max
Economic variables					
Personal monthly income (€)	2124.24	2116.81	804.87	875.00	3625.00
Personal values					
Materialism	2.66	2.65	0.63	1.00	4.78
Environmental self-identity	3.04	3.07	0.83	1.00	5.00
Socio-demographic variables					
Age	50.49	52.36	16.82	18.00	94.00
*Personality traits**					
Extraversion	0.95	0.98	1.58	-3.00	3.00
Tolerance	0.28	0.31	1.63	-3.00	3.00
Emotionality	-0.62	-0.62	1.50	-3.00	3.00
Conscientiousness	1.02	1.02	1.42	-3.00	3.00
Openness to experience	0.13	0.08	1.47	-3.00	3.00
Integrity	1.79	1.78	1.23	-3.00	3.00

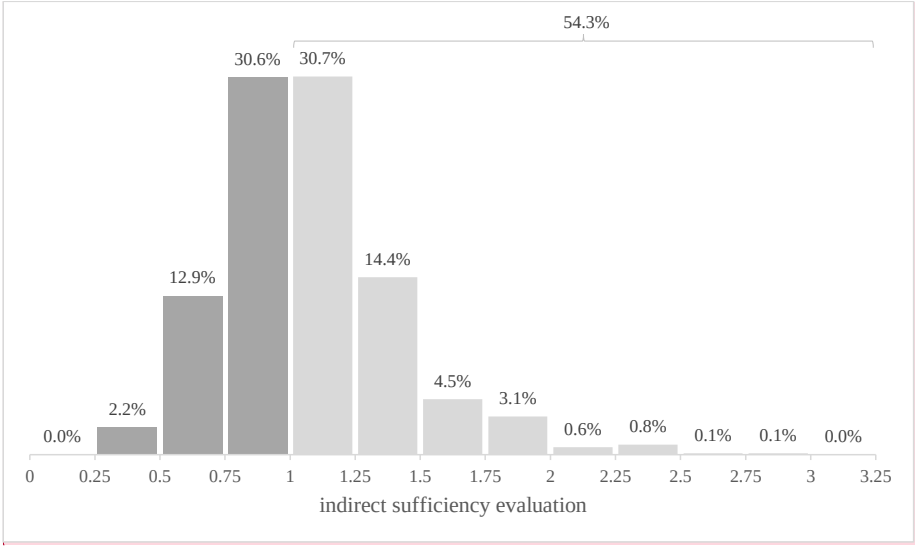
Sample characteristics are presented for the unweighted sample and the weighted sample (to achieve similarity to the frequency distributions in the Flemish populations for socio-economic position, gender and age).

**Personality traits are measured on a numeric 7-point scale, coded from -3 to +3. The negative and positive endpoints of the scale are respectively labelled as follows: closed, reserved vs. open, spontaneous (extraversion); authoritarian, stubborn vs. indulgent, tolerant (tolerance); sober, self-confident vs. emotional, insecure (emotionality); nonchalant, rash vs. perfectionist, dutiful (conscientiousness); docile, conservative vs. original, creative (openness to experience); not always sincere, sly vs. trustworthy, honest (integrity).*

Appendix 4: Robustness checks

A. Histogram (relative frequencies) of indirect sufficiency evaluation (ISE) based on the lower bound value of the personal monthly income bracket (N=1645)

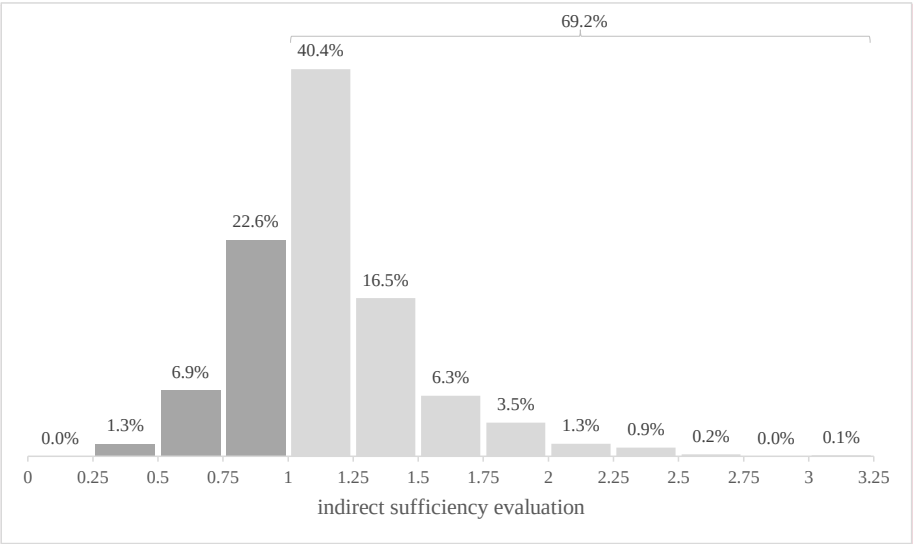
M = 1.04 SD = 0.34 Min = 0.20 Max = 2.92



Met opmerkingen [DC3]: this figure has been adjusted (x-axis): rather than reporting border values for each category (e.g. [1600;1800[), border values (tick marks between categories) are reported.

B. Histogram (relative frequencies) of ~~I~~indirect sufficiency evaluation (ISE) based on the upper bound value of the personal monthly income bracket (N=1645)

M = 1.18 SD = 0.34 Min = 0.25 Max = 3.12



Met opmerkingen [DC4]: this figure has been adjusted (x-axis): rather than reporting border values for each category (e.g. [1600;1800[), border values (tick marks between categories) are reported.

C. *Ordinal logistic regression analysis with direct sufficiency evaluation (DSE) as dependent variable*

CONCEPT		Sufficiency Evaluation DSE
COEFFICIENT		Odds ratio
Economic variables		
Personal monthly income (in thousands of euros)		5.962***
Homeownership	Non-homeowner	-
	Homeowner (ongoing mortgage payments)	1.221
	Homeowner (full ownership)	1.783***
Personal values		
Materialism		0.663***
Environmental self-identity		0.963
Socio-demographic variables		
Age		0.991
Gender	Male	-
	Female	1.015
Number of children living at home	No children	-
	1 child	0.750
	2 children	0.736
	>=3 children	0.578**
Relationship/cohabitation	No relationship	-
	Relationship (not living together)	1.001
	Relationship (living together, partner has no income)	0.607
	Relationship (living together, partner has income)	1.573***
Education	Medium educated	-
	Lower educated	0.867
	Higher educated	1.336**
Socio-economic situation	Employed	-
	Pensioner	0.808
	Unemployed	0.198***
	Incapable to work	0.451***
	Househusband/wife	1.564
Personality traits		
Extraversion		1.035
Tolerance		1.012
Emotionality		0.911**
Conscientiousness		1.082*
Openness to experience		1.054
Integrity		1.033
Wave		0.929
Constant		
Cut 1		0.025***
Cut 2		0.136***
Cut 3		1.339
Cut 4		20.836***
Cut 5		489.632***
Pseudo R^2		0.226
N		1645

The same weights are used as in the original analysis to achieve similarity to the frequency distributions in the Flemish population.

, ** and * indicate significance at the 10, 5 and 1% level. Both unstandardized (B) and standardized (β) coefficients are shown. Reference group: men owning no house, having no children, having no relationship, averagely educated and employed (either full-time, part-time or self-employed).*

Coefficients differing from the original analysis in significance (switching from significance to non-significance or vice versa) are indicated in dark grey; coefficients differing from the original model in level of significance (number of asterisks) are indicated in light grey.

D. Linear regression analysis after exclusion of 33 cases with potentially faulty ISE value (N=1612)

CONCEPT		Sufficiency Level SL		Sufficiency Evaluation DSE		ISE	
COEFFICIENT		B	β	B	β	B	β
Economic variables							
Personal monthly income (in thousands of euros)		407.132***	0.544	0.622***	0.518	0.296***	0.688
Homeownership	Non-homeowner						
	Homeowner (ongoing mortgage payments)	46.810	0.036	0.092	0.045	-0.016	-0.021
	Homeowner (full ownership)	-27.518	-0.023	0.202***	0.107	0.024	0.035
Personal values							
Materialism		68.921***	0.073	-0.143***	-0.095	-0.042***	-0.078
Environmental self-identity		25.981	0.036	0.001	0.001	-0.018**	-0.044
Socio-demographic variables							
Age		4.408***	0.127	-0.002	-0.043	-0.003***	-0.126
Gender	Male						
	Female	-7.450	-0.006	0.024	0.012	0.001	0.001
Number of children living at home	No children						
	1 child	-4.395	-0.003	-0.145*	-0.058	-0.007	-0.008
	2 children	61.498	0.045	-0.138*	-0.062	-0.045**	-0.057
	>=3 children	3.519	0.002	-0.242**	-0.076	-0.015	-0.013
Relationship/cohabitation	No relationship						
	Relationship (not living together)	143.932***	0.070	-0.037	-0.011	-0.072***	-0.061
	Relationship (living together, partner has no income)	155.520*	0.054	-0.157	-0.034	-0.070*	-0.042
	Relationship (living together, partner has income)	87.782***	0.071	0.162***	0.082	-0.038**	-0.053
Education	Medium educated						
	Lower educated	-15.504	-0.011	-0.025	-0.011	-0.009	-0.011
	Higher educated	-9.798	-0.008	0.088*	0.046	-0.004	-0.006
Socio-economic situation	Employed						
	Pensioner	-98.034	-0.076	-0.147	-0.071	0.064*	0.086
	Unemployed	71.798	0.023	-0.700***	-0.137	-0.060**	-0.032
	Incapable to work	-7.101	-0.003	-0.333***	-0.081	-0.005	-0.003
	Househusband/wife	-66.899	-0.022	0.102	0.021	-0.012	-0.007
Personality traits							
Extraversion		-16.779	-0.045	0.017	0.028	0.006	0.030
Tolerance		1.264	0.004	0.005	0.009	0.001	0.004
Emotionality		1.126	0.003	-0.035**	-0.056	0.001	0.006
Conscientiousness		16.977*	0.041	0.026	0.039	-0.006	-0.027
Openness to experience		11.585	0.029	0.007	0.011	-0.006	-0.027
Integrity		-14.051	-0.029	0.011	0.014	0.008	0.029
Wave		13.569	0.011	-0.026	-0.014	-0.002	-0.004
Constant		528.780***	.	3.337***	.	0.811***	.
R^2		0.366		0.442		0.457	
N		1612		1612		1612	

The same weights are used as in the original analysis to achieve similarity to the frequency distributions in the Flemish population.

, ** and * indicate significance at the 10, 5 and 1% level. Both unstandardized (B) and standardized (β) coefficients are shown. Reference group: men owning no house, having no children, having no relationship, averagely educated and employed (either full-time, part-time or self-employed).*

Coefficients differing from the original analysis in significance (switching from significance to non-significance or vice versa) are indicated in dark grey; coefficients differing from the original model in level of significance (number of asterisks) are indicated in light grey.

E. Linear regression analysis after adjustment of 33 cases with potentially faulty ISE value to the value 1 (N=1645)

CONCEPT		Sufficiency Level SL		Sufficiency Evaluation DSE		ISE	
COEFFICIENT		B	β	B	β	B	β
Economic variables							
Personal monthly income (in thousands of euros)						0.273***	0.017
Homeownership	Non-homeowner					-	-
	Homeowner (ongoing mortgage payments)					-0.013	0.021
	Homeowner (full ownership)					0.023	0.021
Personal values							
Materialism						-0.044***	0.012
Environmental self-identity						-0.020**	0.009
Socio-demographic variables							
Age						-0.003***	0.001
Gender	Male					-	-
	Female					0.006	0.016
Number of children living at home	No children					-	-
	1 child					-0.003	0.022
	2 children					-0.051**	0.023
	>=3 children					-0.022	0.032
Relationship/cohabitation	No relationship					-	-
	Relationship (not living together)					-0.075***	0.025
	Relationship (living together, partner has no income)					-0.079*	0.042
	Relationship (living together, partner has income)					-0.038**	0.019
Education	Medium educated					-	-
	Lower educated					-0.015	0.019
	Higher educated					-0.002	0.018
Socio-economic situation	Employed					-	-
	Pensioner					0.066*	0.036
	Unemployed					-0.072***	0.026
	Incapable to work					-0.011	0.022
	Househusband/wife					-0.017	0.038
Personality traits							
Extraversion						0.007	0.005
Tolerance						0.000	0.005
Emotionality						-0.000	0.006
Conscientiousness						-0.006	0.005
Openness to experience						-0.006	0.005
Integrity						0.008	0.006
Wave						-0.005	0.014
Constant						0.876***	0.058
R^2						0.420	
N						1645	

The same weights are used as in the original analysis to achieve similarity to the frequency distributions in the Flemish population.

, ** and * indicate significance at the 10, 5 and 1% level. Both unstandardized (B) and standardized (β) coefficients are shown. Reference group: men owning no house, having no children, having no relationship, averagely educated and employed (either full-time, part-time or self-employed).*

Coefficients differing from the original analysis in significance (switching from significance to non-significance or vice versa) are indicated in dark grey; coefficients differing from the original model in level of significance (number of asterisks) are indicated in light grey.

F. *Linear regression analysis after adjustment of lower boundary for personal monthly income to 500 euros instead of 750 euros (N=1674)*

CONCEPT		Sufficiency Level SL		Sufficiency Evaluation DSE		ISE	
COEFFICIENT		B	β	B	β	B	β
Economic variables							
Personal monthly income (in thousands of euros)		482.341***	0.582	0.598***	0.516	0.272***	0.646
Homeownership	Non-homeowner						
	Homeowner (ongoing mortgage payments)	34.540	0.023	0.083	0.040	-0.014	-0.018
	Homeowner (full ownership)	-14.681	-0.011	0.224***	0.118	0.017	0.025
Personal values							
Materialism		79.591***	0.073	-0.155***	-0.102	-0.045***	-0.082
Environmental self-identity		47.144**	0.057	-0.007	-0.006	-0.025***	-0.060
Socio-demographic variables							
Age		5.441***	0.135	-0.003	-0.055	-0.003***	-0.141
Gender	Male						
	Female	-30.780	-0.023	0.022	0.011	0.008	0.012
Number of children living at home	No children						
	1 child	-27.789	-0.015	-0.136*	-0.054	0.002	0.002
	2 children	79.866*	0.051	-0.126*	-0.057	-0.051**	-0.063
	>=3 children	33.450	0.015	-0.241***	-0.075	-0.026	-0.022
Relationship/cohabitation	No relationship						
	Relationship (not living together)	156.960***	0.066	-0.017	-0.005	-0.080***	-0.066
	Relationship (living together, partner has no income)	184.282**	0.055	-0.157	-0.034	-0.082*	-0.048
	Relationship (living together, partner has income)	90.351***	0.063	0.162***	0.081	-0.040**	-0.055
Education	Medium educated						
	Lower educated	6.822	0.004	-0.013	-0.006	-0.017	-0.021
	Higher educated	-12.578	-0.009	0.106**	0.055	-0.005	-0.007
Socio-economic situation	Employed						
	Pensioner	-118.478*	-0.079	-0.138	-0.066	0.069**	0.091
	Unemployed	120.187**	0.032	-0.754***	-0.145	-0.080***	-0.042
	Incapable to work	11.352	0.004	-0.330***	-0.079	-0.016	-0.010
	Househusband/wife	28.842	0.008	0.256	0.051	-0.060	-0.033
Personality traits							
Extraversion		-17.170	-0.040	0.015	0.024	0.007	0.034
Tolerance		0.563	0.001	0.013	0.022	0.001	0.004
Emotionality		2.139	0.005	-0.040***	-0.063	0.000	0.002
Conscientiousness		13.966	0.029	0.023	0.034	-0.005	-0.022
Openness to experience		7.349	0.016	0.008	0.013	-0.007	-0.029
Integrity		-10.102	-0.018	0.001	0.002	0.007	0.024
Wave		32.122	0.023	-0.032	-0.017	-0.009	-0.012
Constant		242.032*	.	3.468***	.	0.905***	.
R^2		0.396		0.443		0.421	
N		1,674		1,674		1,674	

As the sample size is larger than in the original analysis, new weights are computed to achieve similarity to the frequency distributions in the Flemish population.

, ** and * indicate significance at the 10, 5 and 1% level. Both unstandardized (B) and standardized (β) coefficients are shown. Reference group: men owning no house, having no children, having no relationship, averagely educated and employed (either full-time, part-time or self-employed).*

Coefficients differing from the original analysis in significance (switching from significance to non-significance or vice versa) are indicated in dark grey; coefficients differing from the original model in level of significance (number of asterisks) are indicated in light grey.

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