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Associations between environmental concern, reduced consumption behaviours, income, and subjective well-being: Results from a representative sample of English adults

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Abstract

Climate change and other environmental issues pose growing threats to ecological systems and to human well-being. While environmental concern has been linked to poorer mental health outcomes, engaging in pro-environmental behaviours like reducing one's consumption may buffer or even reverse these effects. This study examines how reductions in consumption relate to multiple dimensions of subjective well-being, and whether income moderates these relationships. Using cross-sectional data from the UK People and Nature Survey (N = 18,721), I analysed associations between environmental concern, self-reported reductions in consumption, income, and four well-being outcomes: life satisfaction, happiness, anxiety, and feeling that life is worthwhile using weighted multiple regression and moderated moderation analyses.

The results showed that reduced consumption was positively associated with life satisfaction, happiness, and feelings of worthwhileness, but simultaneously also associated with higher anxiety. Environmental concern was primarily linked to increased anxiety and showed weak or inconsistent associations with positive well-being outcomes once reduction behaviour was accounted for. Contrary to expectations, reduced consumption did not moderate the relationship between environmental concern and subjective well-being. However, income played a significant role: a three-way interaction revealed that environmentally concerned individuals with higher incomes who reduced their consumption reported the highest levels of happiness, worthwhileness and life satisfaction.

These findings suggest that reducing consumption can enhance positive well-being but heighten anxiousness. Moreover, the psychological benefits of consumption reduction appear to depend on socioeconomic context, underscoring the importance of considering income when promoting sustainable lifestyles.

1. Introduction

Climate change and further environmental crises are among the most pressing challenges facing modern society. Recent research indicates that the 1.5-degree target set by the Paris Agreement is unlikely to be met (Droege, 2025). Keeping the current status, global warming could reach approximately 2.8 degrees. Such an increase would likely result in more frequent flooding, wildfires, extreme heat events, rising sea levels, and other environmental hazards (Rahmstorf, 2024). Furthermore, the impacts on human health are significant, potentially causing cardiovascular, respiratory, and kidney diseases, as well as mental health problems (Corpuz, 2024; Radua et al., 2024).

A major driver of carbon emissions is overconsumption (Stuart & Petersen, 2020). Globally, more than 60% of greenhouse gas emissions are attributable to household consumption, with wealthier countries like the USA or several European countries contributing the largest share (Hickel et al., 2022; Ivanova et al., 2016). Furthermore, overconsumption not only affects increased carbon emissions but also further environmental issues like water usage, chemical pollution, or textile waste (Niinimäki et al., 2020). Therefore, researchers argue that especially in the affluent global north overconsumption needs to be reduced (Wiedmann et al., 2020). In order to avoid overconsumption, the shift towards conscious and mindful forms of consumption may be one way of adressing these global environmental crises. The present study responds to recent calls for psychological and behavioural sciences to examine the psychological drivers and mechanisms underlying reduced consumption (Krpan et al., 2025).

While previous research has identified an overall positive relationship between reduced consumption and subjective well-being, the underlying mechanisms remain unclear. It is proposed that awareness of environmental threats, which can lead to increased environmental concern, may diminish subjective well-being (SWB). However, aligning one's behaviour with environmental attitudes may buffer this negative association. To extend existing literature, income is considered not only as a predictor of SWB but as a moderator of the relationship between reduced consumption and environmental concern. Both positive and negative SWB outcomes are examined to assess whether reduced consumption has a unidimensional effect on SWB.

1.1 Environmental concern on well-being

Current global environmental changes affect not only the climate but also SWB. For instance, a cross-sectional study examining eco-anxiety, well-being, and pro-environmental behavior found that the affective and behavioural components of eco-anxiety were associated with poorer mental health outcomes (Hogg et al., 2024).

A related but less intense emotional response is environmental concern. Environmental concern is considered an environmental attitude resulting from knowledge and awareness about the continuing destruction of the environment (Fransson & Gärling, 1999). Previous literature distinguishes three

dimensions: egoistic concern, which centers on personal factors (e.g., one's own health or safety); social–altruistic concern, which reflects concern for others, like future generations; and biospheric concern, which focuses on caring about nature, animals, and ecosystems. Biospheric concern has been linked to ecological stress, which in turn is associated with depressive symptoms (Helm et al., 2018). In another study, egoistic concerns have been related to lower SWB, whereas altruistic concerns have been associated with higher SWB, particularly among individuals engaged in volunteering activities (Binder & Blankenberg, 2016).

Sociodemographic differences in environmental concern have also been examined. Higher levels of concern are reported in wealthier countries, among younger individuals, women, and those living in rural areas (Gifford & Nilsson, 2014; McCright & Xiao, 2014).

Despite these findings, research directly examining the relationship between environmental concern and SWB remains limited compared to other environmental attitudes, such as eco-anxiety. Because concern involves negative appraisals of environmental threats, it may similarly relate to reduced SWB.

H1: Higher environmental concern is associated with lower well-being

1.2 The impact of reducing consumption

The negative impact of environmental concern on SWB may be buffered when individuals align their values with their behaviours, specifically through pro-environmental behaviours. Such behaviours represent individual efforts to reduce household-level carbon emissions and can include practices ranging from taking public transport to reducing meat consumption (Ciocîrlan et al., 2025). Engaging in pro-environmental behaviours, including reducing consumption, contributes to lowering carbon emissions and has been shown in meta-analytical research to positively affect SWB (Zawadzki et al., 2020).

As previously noted, a substantial part of carbon emissions originates from household consumption; thus, motivating individuals to reduce their consumption can make a difference.

Terms such as anti-consumption, sustainable consumption, low-consumption, sufficiency, and voluntary simplicity refer to a range of related concepts with both overlaps and distinctions (Makri et al., 2020). However, a clear differentiation and conceptualization of each concept is still lacking.

Sustainable consumption focuses on avoiding overconsumption while considering basic human needs. Furthermore, sustainable consumption contributes to the well-being of the environment and future generations (Quoquab & Mohammad, 2020). Because sustainable consumption focuses on reducing the impact of emissions from overconsumption on the environment it is considered a form of pro-environmental behaviour (Schmitt et al., 2018). Similarly, anti-consumption was first defined as a form of resistance or rejection of overconsumption (Lee, 2022). Additionally, there is the term of sufficiency,

which focuses on consumption within ecological limits and is originating from ecological economic research (Jungell-Michelsson & Heikkurinen, 2022).

What those concepts have in common is the reduction of not only material goods but reducing natural resources in general. Nevertheless, there are various low-consumption lifestyles, particularly focusing on material reduction, like clothing. One reduction lifestyle that explicitly promotes reduced consumption in an environmentally conscious way is voluntary simplicity (VS) (Gregg, 2003). VS is a lifestyle centered around mindful, intentional, and reduced consumption (Alexander & Ussher, 2012; Makri et al., 2020).

Previous research has examined how lowering one's level of material consumption relates to psychological well-being. A recent review by Hook et al. (2023) reports that VS and minimalism show a positive association with SWB, with small to moderate effect sizes. Several explanations have been proposed for this pattern. Owning and consuming less can ease stress, enhance positive feelings, raise mindfulness and free up both time and financial resources (Lloyd & Pennington, 2020; Martin-Woodhead, 2022; Vladimirova, 2021). Additionally, shifting attention away from acquiring material goods toward personal growth and intrinsic goals may further support improved well-being (Kasser, 2016).

Often connected to research about reduced consumption is the self-determination theory (Ryan & Deci, 2000). Self-determination theory consists of three proposed psychological needs: autonomy, competence and relatedness. Reducing one's consumption seems to be a way to increase those three psychological needs and in turn impact life satisfaction positively (Rich et al., 2017). Some pro-environmental actions, especially those that require consuming less, may initially seem inconvenient or restrictive (Jacob et al. 2009). Prospect theory, and in particular its predictions with respect to loss aversion suggests that people feel the impact of losses more strongly than equivalent gains (Kahneman and Tversky, 1979). Although classical consumer theory assumes that individuals choose in ways that maximize their utility (Schwartz, 2015), research indicates that people often misjudge how future consumption will affect their happiness (Wilson and Gilbert, 2003). As a result, they may overestimate the emotional benefits of higher consumption. Contrary to homo-economic theories, empirical studies have found that engaging in more sustainable consumption patterns, which usually involve using fewer material goods, is linked to higher life satisfaction (Welsch & Kühling, 2010). Accordingly, placing strong importance on materialism and financial success has been linked to lower levels of SWB, particularly in terms of self-appraisal (Dittmar et al., 2014).

Altogether, I propose that there is a positive link between reducing your consumption and different well-being measurements.

H2: Higher levels of reduction behaviour are associated with higher well-being

1.2 Environmental concern and reduced consumption on well-being

Reducing one's consumption may serve as a strategy to avoid cognitive dissonance. Cognitive dissonance occurs when a person's attitudes conflict with their behaviours, producing psychological discomfort (Festinger, 1957). Individuals who are aware of, and concerned about, environmental issues may therefore seek to align their actions with their values, thereby minimizing the potential for dissonance.

The concept of cognitive dissonance is connected to the idea that closing the gap between personal values and actual behaviour can improve SWB (Portus et al., 2024). Prior research similarly shows that individuals who not only worry about environmental issues but also engage in protective actions report higher levels of SWB (Suárez-Varela et al., 2016). Related to this is the value–action paradox, which highlights that greater understanding of climate change often increases concern without necessarily leading to behaviour change, a pattern that can undermine SWB(Lenzen & Cummins, 2011). Based on this, I propose that the negative impact of environmental concern on SWB is buffered when concerned individuals take action by intentionally reducing their consumption.

H3: Reduction behaviour moderates the association between environmental concern and well-being, such that the negative association is weaker at higher levels of reduction behaviour.

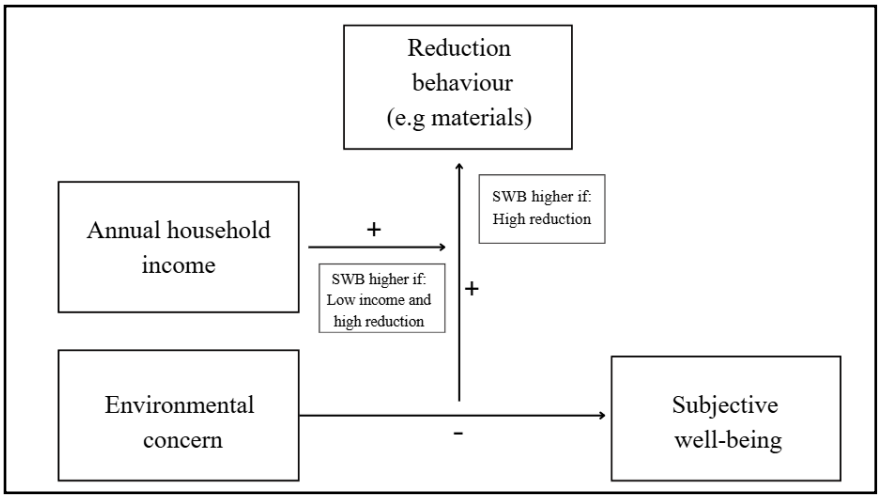
1.4 The moderating role of income

Capstick et al. (2022) showed that the positive association between pro-environmental behaviour and SWB holds across cultures and across different socioeconomic groups. These findings challenge the "privilege hypothesis," which assumes that this relationship is stronger among individuals with higher incomes. Additionally, a study focusing on the connection between sustainable behaviour and SWB found no differences between higher or lower income groups, pointing out that reducing behaviours are not harming low-income groups (Herziger et al., 2020). Although income can influence SWB, its effect is relatively small and tends to level off once basic needs are met (Diener & Biswas-Diener, 2002). Research on how income interacts with anti-consumption lifestyles and well-being is still limited. One notable study by Boujbel and d'Astous (2012) found that reducing consumption is particularly beneficial for individuals with lower incomes. They suggest that consuming within one's financial means and maintaining control over consumption desires may enhance SWB. Based on this result, I intend to investigate whether income acts as a moderator in the relationship between reduced consumption and well-being. Figure 1 illustrates the model of the moderated moderation.

H4: Income moderates the association between reduction behaviour and SWB, with stronger positive effects among individuals with lower income.

Figure 1

Illustration of the theoretical model of the moderating moderation



As Carrero et al. (2020) mentioned, different facets of sustainable consumption could lead to different SWB outcomes.

Furthermore, the findings discussed above focus primarily on unidimensional measurements of SWB, mainly happiness and life satisfaction. Following the recommendation of previous papers around sustainable consumption and voluntary simplicity (Herziger et al.,2020; Hook et al. 2023), it is important to examine additional indicators of SWB. This addition contributes to the existing literature and to determine whether different underlying mechanisms may be at work. Therefore, I will not only analyze happiness and satisfaction but also anxiousness and worthwhileness.

2. Methods

2.1 Design

The analysis is based on the People and Nature Survey UK (PaNS) which is a large ongoing survey in the UK (Natural England, 2024). The goal of the survey is to assess how adults interact with the natural environment. In addition, the survey includes environmental attitudes, self-reported environmental behaviours and different well-being measurements. The survey uses a cross-sectional design and has been active continuously since April 2020. Participants are UK residents above 16 years.

With as many as 25,000 participants each year, PaNS ranks among the largest surveys examining interactions between people and nature. For the purpose of this study, respondents who completed the environmental attitudes and behaviours section and answered all relevant items in Module 4 were included. Because I am located in Austria, I worked with the “safeguarded” version of the dataset

accessed through a registered project with the UK Data Archive. This version contains a selection of demographic information, such as age and restricted categories of income, but excludes variables like ethnicity. Although this reduces some level of detail, it is unlikely to have meaningfully influenced the main findings. Due to the large sample size and variety of questions this dataset will be used and no additional data will be collected.

2.2 Participants

The dataset initially included 112,412 participants. First of all, participants who did not answer the relevant module 4 were removed from the data set. Cases with missing values, as well as respondents who selected "I don't know" or "Prefer not to say," were excluded. The final analytic sample consisted of N = 18,721 participants. In Table 1 there is an overview of the descriptive measurements, including gender, age, region and qualification.

Table 1

Sociodemographic characteristics of participants

	n	*%*
Gender		
Female	9551	51.02
Male	9170	48.98
Region		
North East	971	5.10
North West	2433	12.99
Yorkshire and the Humber	1847	9.86
East Midlands	1822	9.73
West Midlands	2040	10.90
East	2136	11.41
London	2714	14.50

South east	2994	15.98
South West	1764	9.43
Qualification		
A university degree (or above)	5688	30.28
Any other qualifications	11999	64.09
No qualification	1054	5.63
Age group		
16 to 24	2262	12.08
25 to 39	4543	24.27
40 to 54	4590	24.52
55 to 64	2899	15.49
65+	4427	23.65

2.3 Measurements

Outcome: Well-being is measured using four single-item indicators: worthwhile, anxious, satisfied, and happy, each rated on a scale from 1 (not at all) to 10 (completely). While feeling life is overall satisfying or worthwhile, the happiness and anxious items only refer to the previous day: "How anxious were you feeling yesterday" (Office for national statistics, 2021).

Main predictor: Environmental concern is measured with a single item that asks "How concerned are you about damage to the natural environment?" rated on a 5-point Likert scale ranging from strongly agree to completely disagree.

Moderators: Since the PANs does not include questions for VS or specific anti-consumption constructs I will use the scale for *reduced consumption* in different domains. It was assessed with the prompt "I try to reduce …", followed by four behaviours: meat consumption, water use, energy use, and things one buys. Participants could choose on a 5-point Likert scale from "Strongly agree" to "Strongly disagree".

Income, used as the second moderator, was assessed via income bands ranging up to £65,000 or more per year. Midpoints of each band were calculated to convert the measure into a continuous variable. To support the interpretation the income variable was divided by 10.000. Therefore, the estimates indicate the difference in the well-being outcomes by a change of 10.000 pounds.

Covariates: Gender, region, and age were included as covariates to adjust for potential confounding influences on both environmental concern and well-being outcomes. Gender has been shown to be associated with differences in environmental concern and well-being measurements, particularly negative affect (Blanchflower & Bryson, 2024; Strapko et al., 2016). Regional location was included to account for differences between urban and rural environments. Participants were classified into nine regions of England (North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East London, South East, and South West). Age was also controlled for, as prior research indicates age-related differences in environmental attitudes and well-being (Hook et al., 2023). In the PANs dataset, age is measured in bands for respondents aged 16 and older, with the highest category being 65+.

2.4 Data Analysis

The analysis was conducted in R studio (version 2024.09.0+375; Posit Team, 2024) using R (version 4.4.1, R Core Team, 2024). Multiple regression models and PROCESS model 3 were conducted for the analysis (Hayes, 2012). First of all, participants were removed who did not answer the relevant modules. Afterwards, answers of "I don't know" and "Prefer not to say" were excluded as well. Age and Income variables were recoded with the midpoints of each range bracket. Environmental concern and the reduction scale were reversed, so high values indicate high environmental concern and high reduction of consumption. Internal consistency analyses indicated that the four-item reduction behaviour scale showed acceptable reliability ($\alpha = .73$), with moderate average inter-item correlations. "Things I buy," "water reduction," and "energy reduction" displayed relatively high item–total correlations, whereas "meat reduction" was somewhat less strongly aligned with the overall scale. The four items showed acceptable internal consistency and all items loaded positively on correlated latent factors.

As specified in the preregistration a sensitivity analysis was conducted to examine if there are differences in variance between the items "I try to reduce meat, energy and water" in comparison to "things I buy in general". Beforehand this was determined due to the difference between reduction in resources all over or material reduction, that was explained in the introductory part. The analyses using a three-item reduction scale including only meat, water, and energy reduction showed somewhat lower internal consistency ($\alpha = .64$) than the full four-item scale, indicating that "things I buy" contributes to

the overall homogeneity of the construct. Additionally, only analyzing material reduction tended to explain less variance in the well-being measurements, therefore most of the results and the discussion will focus on the whole scale.

The predictors and outcomes were examined for possible outliers. No outliers were found. Before starting the regression models, all predictors were centered to avoid multicollinearity that can arise by the derivation and use of interaction terms. In order to specify important predictors or moderators, a blockwise regression was conducted. For each SWB measurement, initially only covariates were added. Stepwise I added environmental concern, reduction behaviour, and finally income. Afterwards, the two-way interactions and finally the three-way interaction were analyzed. Therefore, for each SWB outcome, there were six regression models. For each step, the effect sizes in the form of R^2 were calculated. Additionally, an ANOVA was used to visualize if each model is significantly different from the previous one. The final model, which included the three-way interaction, was not only calculated with a multiple regression model but with the PROCESS model 3 by Hayes to receive confidence intervals and conditional effects.

VIFs and homoscedasticity were analyzed for each model. The VIfs range from 1.01 to 1.34, therefore multicollinearity does not seem to be a problem. Contrary to that, homoscedasticity seems to be conspicuous. Based on that, I calculated robust coefficients and found no significant differences to the initial results. To visualize the interaction a three-way interaction plot was designed, which can be seen in the results. Finally, survey weights were applied so that estimates are representative of the target adult population in England, correcting for unequal selection probabilities and differential nonresponse. In PaNS, the main analysis weight is derived by calibrating respondents to external population benchmarks (e.g gender, age, ethnicity) using iterative proportional fitting and then scaling to the monthly target sample size. All statistical analyses in this thesis use these weights.

3. Results

Exploratory analyses included additional regression models and correlation analyses. These revealed a strong positive correlation between environmental concern and the reduction scale (r = .44) with a somewhat weaker correlation for the reduction of things (r = .33). A linear regression analysis indicated that environmental concern significantly predicted reduction behaviour, explaining 19% of the variance (R^2 = .19).

Descriptive results can be seen in Table 2**.**

Table 2

Descriptive statistics and correlations for study variables

Variable	*n*	*M*	*SD*	1	2	3	4	5	6	7
Environmental concern	18,721	4.2	0.74	—						
Reduction behaviour	18,721	3.72	0.70	.44***	—					
Income	18,721	34279	18372.87	.05***	−.02*	—				
Well-being anxious	18,721	4.62	3.10	.07***	.08***	.01	—			
Well-being satisfaction	18,721	7.62	2.22	−.05***	.08***	0.22***	-.25***	—		
Well-being happiness	18,721	7.80	2.39	−.05***	−.07***	.18***	-.33***	0.77***	—	
Well-being worthwhile	18,721	42.61	2.30	.08***	.11***	.18***	-.23***	.80***	.74***	–

Note. Frequencies (n) and percentages (%) are based on the analytical sample. * p < .05, ** p < .01, *** p < .001. (N = 18,721). These are unweighted values; analyses were conducted with survey weights.

Tables 3–6 present the unstandardized regression coefficients (*b*) for each regression block with survey weights applied.

3.1 Happiness

Table 3

Blockwise regression analyses predicting happiness yesterday.

Predictor	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Environmental concern (EC)	—	0.16***	n.s	n.s	n.s	n.s

Reduced consumption (RC)	—	—	0.25***	0.24***	0.23***	0.23***
Income (I)	—	—	—	0.25***	0.24***	0.23***
EC × RC	—	—	—	—	n.s	n.s
EC × I	—	—	—	—	n.s	0.00*
RC × I	—	—	—	—	0.00**	0.00**
EC × RC × I	—	—	—	—	—	0.00***
Age	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
Gender (1 = male)	-0.28***	-0.28***	-0.32***	-0.19***	-0.19***	-0.19***
Region (ref=London)						
North East	-0.39***	-0.42***	-0.39**	-0.21*	-0.22**	-0.2
North West	-0.42***	-0.41***	-0.44***	-0.18***	-0.20***	-.18***
Yorkshire and the Humber	-0.34***	-0.29***	-0.28***	-0.17*	-0.18*	-0.17*
East Midlands	-0.48***	-0.47***	-0.44***	-0.32***	-0.36***	-0.32***
West Midlands	-0.37***	-0.36***	-0.33***	-0.20*	-0.20*	-0.21*
East	-0.30***	-0.32***	-0.30***	-0.20*	-0.22*	-0.22*
South East	-0.42**	-0.41***	-0.44***	-0.31***	-0.33***	-0.30***
South West	-0.41***	-0.43***	-0.41***	-0.23**	-0.22**	-0.20**

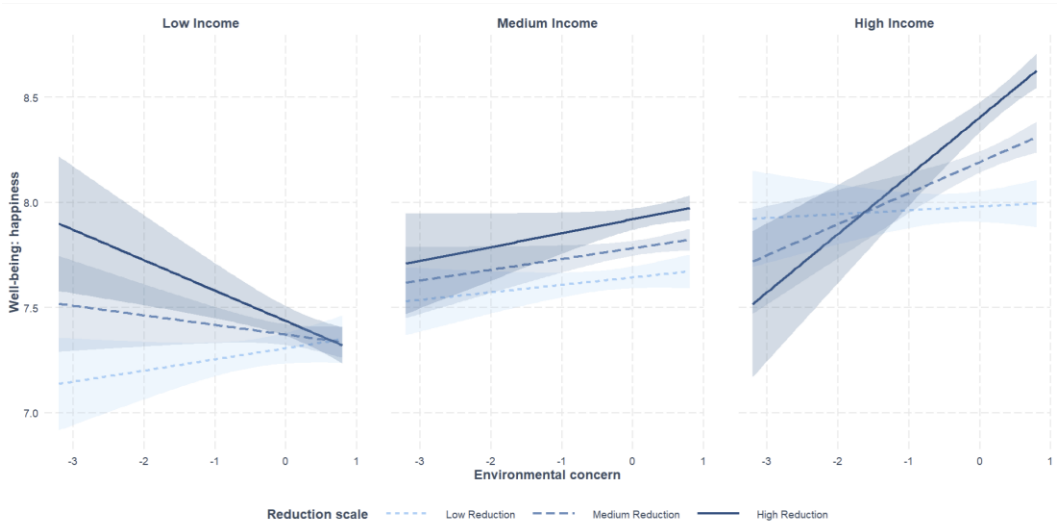
Intercept	7.30***	7.26***	7.23***	6.00***	6.80***	6.90***
R^2 (unweighted)	0.023	0.025	0.028	0.062	0.064	0.066

Note. Coefficients are unstandardized survey-weighted estimates.
* p < .05, ** p < .01, *** p < .001.

For happiness, all regression models significantly improved model fit compared to the previous model ($p < .001$). A PROCESS Model 3 was estimated with environmental concern as the predictor, happiness as the outcome, reduced consumption as the first moderator, and income as the second moderator, controlling for age, gender, and region. The overall model was significant, $F(10, 18{,}710) = 132.85$, $p < .001$, explaining 6.63% of the variance in happiness ($R^2 = .066$). Environmental concern showed a small positive association with happiness ($b = 0.05$, $p = .049$), and reduced consumption was positively associated with happiness ($b = 0.20$, $p < .001$). The two-way interaction between environmental concern and reduced consumption was not significant ($b = 0.02$, $p = .383$). However, the three-way interaction between environmental concern, reduced consumption, and income was significant, $\Delta R^2 = .003$, $F(1, 18{,}710) = 49.49$, $p < .001$. Simple slope analyses indicated that the interaction between environmental concern and reduced consumption was negative at low income ($b = -0.13$, $p < .001$), non-significant at mean income ($b = 0.03$, $p = .259$), and positive at high income ($b = 0.25$, $p < .001$). Figure 2 illustrates this three-way interaction.

Figure 2

Three-way interaction of environmental concern, reduction behaviour and income on SWB: happiness



3.2 Anxiousness

Table 4

Blockwise regression analyses predicting anxiety.

Predictor	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Environmental concern (EC)	—	0.34***	0.22***	0.23***	0.25***	0.26***
Reduced consumption (RC)	—	—	0.28***	0.28***	0.29***	0.29***
Income (I)	—	—	—	–0.07***	–0.05***	–0.08***
EC × RC	—	—	—	—	0.01**	0.00**
EC × I	—	—	—	—	0.00*	0.00*
RC × I	—	—	—	—	n.s.	n.s.
EC × RC × I	—	—	—	—	—	0.00*
Age	–0.06***	–0.06***	–0.06***	–0.06***	–0.06***	-0.06***
Gender (1 = male)	0.10*	n.s	n.s	n.s	n.s	n.s
Region (ref=London)						
North East	-0.46**	-0.42***	-0.39**	-0.44***	-0.43***	-0.43***
North West	-0.12	-0.17	-0.15	-0.19	-0.19	-0.18
Yorkshire and the Humber	-0.32**	-0.29*	-0.28**	-0.32**	-0.31**	-0.29**

East Midlands	-0.31**	-0.27**	-0.25*	-0.29**	-0.27**	-0.28**
West Midlands	-0.30**	-0.26**	-0.23*	-0.27**	-0.24**	-0.24**
East	-0.53***	-0.52***	-0.50***	-0.53***	-0.51***	-0.50***
South East	-0.21*	-0.21*	-0.18	-0.19*	-0.19*	-0.18*
South West	-0.46**	-0.43***	-0.41***	-0.45**	-0.45***	-0.44***
Intercept	7.23***	7.24***	6.27***	6.36***	7.36***	7.36***
R^2 (unweighted)	0.095	0.099	0.010	0.011	0.011	0.011

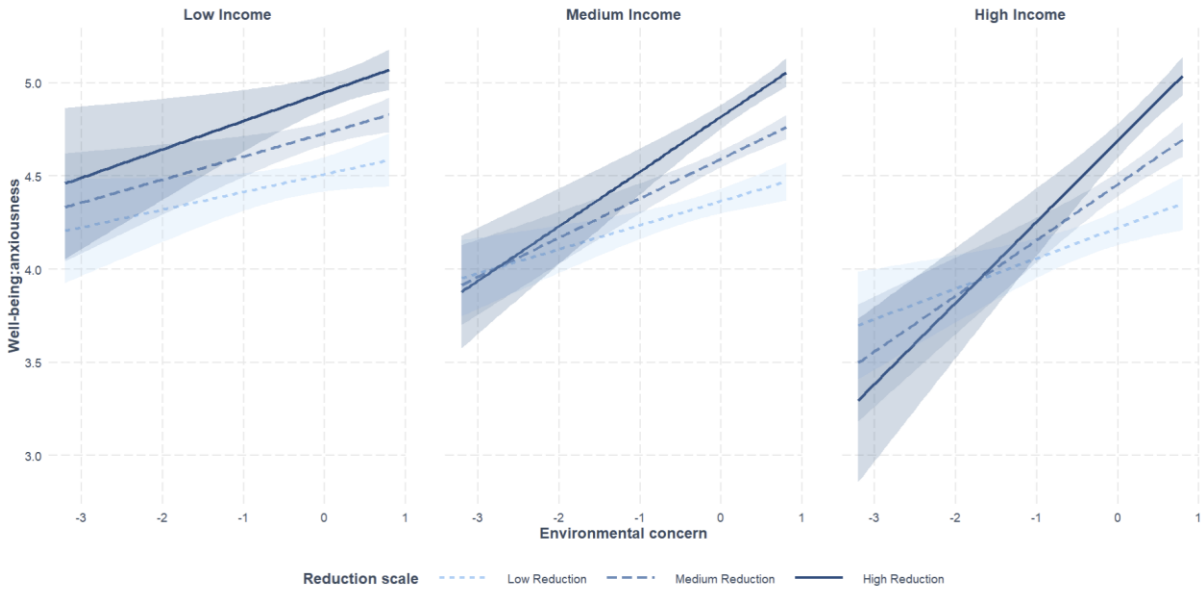
Note. Coefficients are unstandardized survey-weighted estimates.
* p < .05, ** p < .01, *** p < .001.

The moderated moderation model was significant, $F(10, 18{,}710) = 223.08$, $p < .001$, explaining 11% of the variance in anxiousness yesterday ($R^2 = .11$). Environmental concern ($b = 0.21$, SE = 0.03, $p < .001$) and reduced consumption ($b = 0.32$, SE = 0.03, $p < .001$) were both positively associated with anxiousness yesterday. The two-way interaction between environmental concern and reduced consumption was significant ($b = 0.12$, SE = 0.03, $p < .001$). In addition, the three-way interaction between environmental concern, reduced consumption, and income was significant ($\Delta R^2 = .0003$, $F(1, 18{,}710) = 6.77$, $p = .009$), indicating a small moderated moderation effect.

Simple slope analyses showed that the environmental concern and reduced consumption interaction was not significant at low income but became significant at mean ($p < .001$) and high income ($p < .001$). Conditional effects indicated that environmental concern predicted higher anxiousness across all levels of reduction behaviour and income, with the strongest effects observed among participants with high reduction behaviour and high income ($b = 0.51$, SE = 0.08, $p < .001$). Age was a significant negative covariate ($b = -0.06$, SE = 0.001, $p < .001$), whereas gender and region were not significant.

Figure 3

Three-way interaction of environmental concern, reduction behaviour and income on SWB: anxiousness



3.3 Satisfaction

Table 5

Blockwise regression analyses predicting satisfaction.

Predictor	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Environmental concern (EC)	—	0.14***	n.s	n.s	n.s	n.s
Reduced consumption (RC)	—	—	0.26***	0.25***	0.24***	0.24***
Income (I)	—	—	—	0.28***	0.28***	0.27***
EC × RC	—	—	—	—	n.s	n.s
EC × I	—	—	—	—	n.s	n.s

RC × I	—	—	—	—	0.00***	0.00***
EC × RC × I	—	—	—	—	—	0.00**
Age	0.01***	0.01***	0.01***	0.02***	0.02***	0.00***
Gender (1 = male)	-0.13**	-0.13**	-0.17***	n.s	n.s	n.s
Region	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Region (ref=London)						
North East	-0.33**	-0.32**	-0.29**	-0.10	-0.10	-0.10
North West	-0.29***	-0.26***	-0.27***	-0.11	-0.10	-0.10
Yorkshire and the Humber	-0.27**	-0.29**	-0.23**	-0.06	-0.06	-0.05
East Midlands	-0.43***	-0.40***	-0.39***	-0.24**	-0.23**	-0.23**
West Midlands	-0.29***	-0.26***	-0.26***	-0.11	-0.10	-0.10
East	-0.33***	-0.32***	-0.29***	-0.23**	-0.21*	-0.18*
South East	-0.30***	-0.31***	-0.27***	-0.21**	-0.21**	-0.20*
South West	-0.34***	-0.33***	-0.31***	-0.13	-0.12	-0.12
Intercept	7.10***	7.24***	6.27***	6.36***	6.69***	6.69***
R^2 (unweighted)	0.013	0.016	0.020	0.070	0.072	0.073

Note. Coefficients are unstandardized survey-weighted estimates.

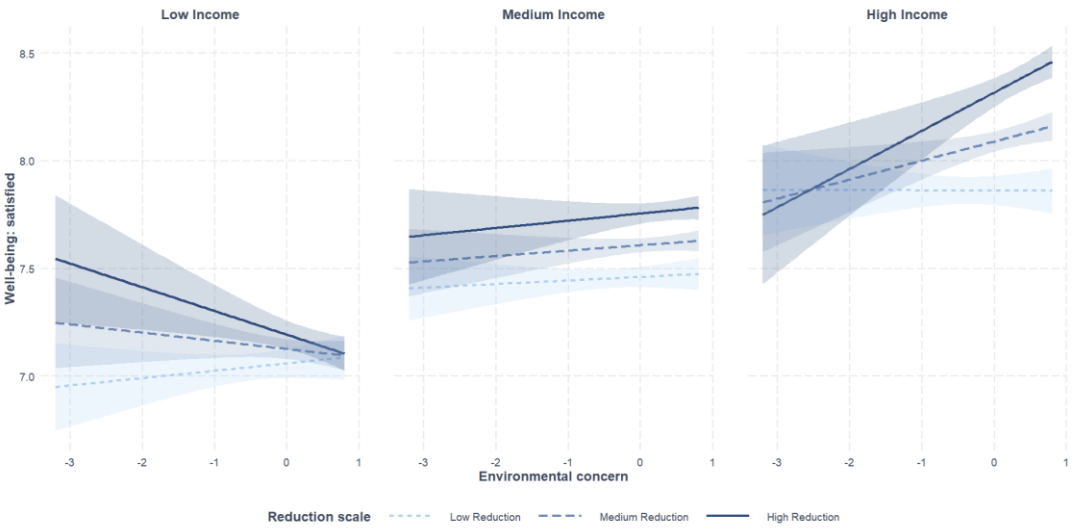
* p < .05, ** p < .01, *** p < .001.

Life satisfaction was jointly moderated by reduced consumption behaviour and income, while controlling for age, gender, and region. The overall model was significant, $F(10, 18{,}710) = 148.24$, $p < .001$, accounting for 7.34% of the variance in life satisfaction ($R^2 = .073$). Environmental concern did not independently predict life satisfaction ($b = 0.03$, $p = .294$), whereas reduced consumption was positively associated with life satisfaction ($b = 0.21$, $p < .001$). The two-way interaction between environmental concern and reduced consumption was not significant ($b = 0.01$, $p = .597$). However, the three-way interaction among environmental concern, reduced consumption, and income was significant, $\Delta R^2 = .001$, $F(1, 18{,}710) = 28.91$, $p < .001$, indicating a conditional pattern.

Tests of conditional interactions showed that the environmental concern and reduced consumption interaction was negative at low income ($b = -0.09$, $p = .002$), non-significant at mean income (b = 0.02, $p = .470$), and positive at high income ($b = 0.17$, $p < .001$). Simple slope analyses further indicated that environmental concern positively predicted life satisfaction only when both reduced consumption and income were relatively high ($b = 0.25$, $p < .001$). In contrast, at high levels of reduced consumption but low income, environmental concern predicted lower life satisfaction (b = −0.10, $p = .014$).

Figure 4

Three-way interaction of environmental concern, reduction behaviour and income on SWB: satisfied



3.4 Worthwhileness

Table 6

Blockwise regression analyses predicting worthwhileness.

Predictor	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6

Environmental concern (EC)	—	0.23***	0.10**	0.09**	0.10**	0.10**
Reduced consumption (RC)	—	—	0.29***	0.29***	0.29***	0.28***
Income (I)	—	—	—	0.26***	0.26***	0.25***
EC × RC	—	—	—	—	n.s	n.s
EC × I	—	—	—	—	n.s	n.s
RC × I	—	—	—	—	n.s	0.00*
EC × RC × I	—	—	—	—	—	0.00**
Age	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
Gender (1 = male)	n.s	n.s	n.s	0.10**	0.11**	0.11**
Region (ref=London)						
North East	-0.23*	-0.22*	-0.18	-0.02	-0.01	-0.01
North West	-0.24**	-0.23**	-0.20**	-0.07	-0.06	-0.03
Yorkshire and the Humber	-0.22**	-0.21**	-0.20**	-0.03	-0.04	-0.01
East Midlands	-0.44***	-0.45***	-0.44***	-0.27***	-0.27**	-0.20**
West Midlands	-0.33***	-0.31***	-0.29***	-0.25	-0.24	-0.15
East	-0.36***	-0.35***	-0.35***	-0.15**	-0.18**	-0.10**

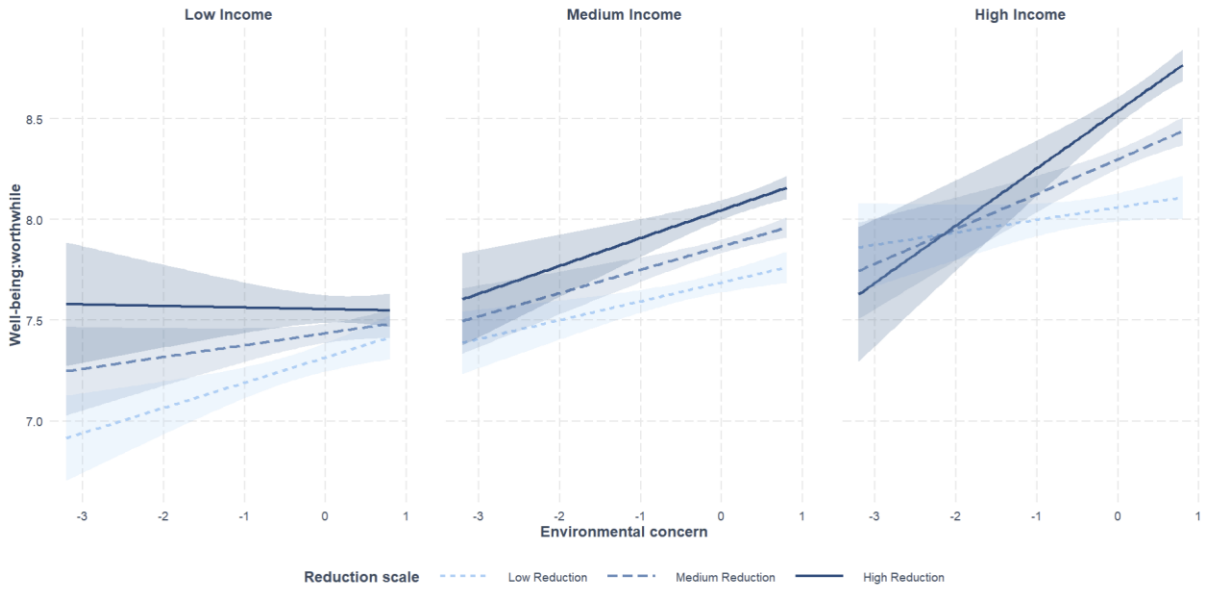
South East	-0.34***	-0.33***	-0.28***	-0.27***	-0.19***	-0.16**
South West	-0.31***	-0.31***	-0.27**	-0.11	-0.12	-0.11
Intercept	6.90***	6.90***	5.98***	5.67***	6.70***	6.70***
R^2 (unweighted)	0.015	0.022	0.027	0.066	0.067	0.065

Note. Coefficients are unstandardized survey-weighted estimates.
* p < .05, ** p < .01, *** p < .001.

The overall Process model for feeling your life is worthwhile overall was significant, $F(10, 18{,}710) = 137.15$, $p < .001$, accounting for 6.8% of the variance in worthwhile well-being ($R^2 = .07$). Environmental concern positively predicted feelings of life being worthwhile (b = 0.12, SE = 0.02, $p < .001$), as did reduction of one's consumption (b = 0.26, SE = 0.03, $p < .001$). Although the two-way interaction between environmental concern and reduced consumption was nonsignificant (b = 0.03, SE = 0.02, $p = .18$), the three-way interaction among environmental concern, reduction behaviour, and income was significant (b ≈ 0.00, SE ≈ 0.00, $p < .001$). Tests of conditional interaction showed that the environmental concern and reduced consumption effect was negative at low income, $F(1, 18{,}710) = 7.07$, $p = .008$, nonsignificant at mean income, $F(1, 18{,}710) = 2.36$, $p = .12$, and strongly positive at high income, $F(1, 18{,}710) = 28.36$, $p < .001$. Simple slopes revealed that environmental concern predicted feeling life is worthwhile across most combinations of the moderators, although effects were strongest among individuals with both high reduction behaviour and high income (b = 0.36, SE = 0.06, $p < .001$). Age and gender were significant positive covariates (ps < .01), while region was marginal (p = .067).

Figure 5

Three-way interaction of environmental concern, reduction behaviour and income on SWB: worthwhile



4. Discussion

This study investigated whether individuals' efforts to reduce their consumption moderate the relationship between environmental concern and different aspects of SWB. By examining multiple SWB outcomes, the goal was to extend the existing literature on the psychological consequences of pro-environmental attitudes and behaviours. In addition, income was analysed not merely as a covariate, but as a potential moderator shaping the interaction between environmental concern, reduction behaviour, and SWB. In the following, I will discuss the hypotheses regarding the given research question.

H1: Higher environmental concern is associated with lower SWB

Environmental concern was initially (when entered alone with covariates) a significant positive predictor for all four SWB outcomes in the initial models. However, after introducing reduction behaviour into the analysis, environmental concern became non-significant for *satisfaction with life* and *feeling happy yesterday*. This result may be explained by the moderate correlation between the two predictors ($r = 0.44$). This suggests that reduction behaviour may be a more proximal predictor of SWB, or that the relationship between environmental concern and SWB is better characterized as indirect, mediated through behaviour. This finding aligns with previous research indicating that concern leads to

consumption reduction and can have substantial positive effects on SWB (Alexander & Ussher, 2012; Vollebregt et al., 2024).

Environmental concern remained a significant predictor only for *feeling anxious yesterday* and the highest explained variance among the models (R^2 = 0.11). This aligns with evidence from the UK showing that environmental concern is associated with climate-related anxiety, particularly among younger individuals (Whitmarsh et al., 2022). In this sample, age was strongly significant, with younger participants reporting higher levels of anxiety.

For the remaining SWB indicators, environmental concern was positively associated with SWB. Therefore, the hypothesis predicting a negative association was not supported. This result is consistent with findings by Binder and Blankenberg (2016), who reported that environmental concern does not necessarily diminish life satisfaction, especially when the concern reflects altruistic concern like concern for the environment or world peace. Furthermore, a longitudinal study found that environmental concern was not a sufficient predictor of life satisfaction, although it accounted for a small proportion of variance in psychological distress (McBride et al., 2021).

A possible interpretation is that environmental concern alone may not initiate a sufficiently intense emotional state to have an impact on SWB; in contrast, climate anxiety, which is characterized by more intense affective responses has been shown to be linked to decreased well-being (Lutz et al., 2023). Since in this dataset only a small number of participants (N=123) described themselves as not concerned overall, interpreting the link between concern and SWB outcomes has to be cautious.

H2: Higher levels of reduction behaviour are associated with higher SWB.

As hypothesised, reduced consumption was a positive predictor of feeling overall satisfied, happiness and worthwhileness. In those cases, trying to reduce material, water, energy and meat, consumption is accountable for partly increasing SWB measurements. This finding aligns with previous research about pro-environmental behaviour, specifically reduced consumption (Kasser, 2017; Hook et al., 2023; Zawadzki et al. 2020). The connection between those variables is widely researched and can be explained by the fulfillment of psychological need satisfaction (Rich et al., 2017) and warm-glow after behaving pro-environmental (Taufik et al., 2015; Venhoeven et al., 2020).
While such behaviours may enhance positive SWB by fostering moral satisfaction, meaning, and value alignment, they may simultaneously increase anxiety by heightening awareness of environmental threats. These findings suggest that pro-environmental consumption behaviours can be psychologically rewarding yet emotionally demanding, highlighting the need to conceptualize SWB as multidimensional rather than unidirectional. For all outcomes and for every block of the regression, age

was a significant covariate. Specifically older participants had higher positive values in SWB outcomes and less anxiousness.

H3: Reduction behaviour moderates the association between environmental concern and SWB, such that the negative association is weaker at higher levels of reduction behaviour.

The third hypothesis examined whether engaging in consumption-reduction behaviours helps close the value–action gap and thereby buffers potential decreases in SWB associated with environmental concern. The results show limited support for this hypothesis. A slightly significant interaction between environmental concern and reduction behaviour emerged only for anxiousness. For life satisfaction, feelings of worthwhileness, and happiness, no significant two-way interactions were observed.

A potential reason for that is presented by Zawadzki et al. (2020), who showed that pro-environmental behaviours that generate meaning are more strongly associated with well-being than low-effort or habitual actions. Consequently, behaviours such as switching off lights or reducing water use may function more as routine habits than as meaningful expressions of environmental values. Similarly, perceived consumer effectiveness (PCE) could also impact this link. PCE refers to an individual's belief about how much consumers can influence environmental issues with their behaviour (Roberts, 1996). PCE was shown to influence environmentally sustainable consumption for concerned individuals (Kang et al. 2013). Accordingly, whether individuals perceive their reduction behaviours as environmentally impactful may also shape the relationship between reduced consumption and SWB. Reducing everyday behaviours such as energy use or water consumption may not elicit a sufficient sense of PCE, as individuals may feel that these actions have little influence on large-scale environmental problems. Furthermore, it may even increase feelings of powerlessness, explaining the significant moderation with anxiousness (Williams & Jaftha, 2020).

Altogether, reduced consumption was a direct predictor of SWB across outcomes, but did not moderate the relationship between environmental concern and SWB. Future research could examine more costful or resourceful pro-environmental behaviours, like volunteering or living a consequently minimalistic lifestyle as a buffer to environmental concern.

H4: Income moderates the association between reduction behaviour and SWB, with stronger positive effects among individuals with lower income.

The fourth hypothesis concerned the three-way interaction, predicting that participants from low-income groups who report high environmental concern and high consumption-reduction behaviour would have the highest levels of SWB, as people may feel emotionally rewarded about acting sustainably while staying within financial means (Boujbel & d'Astous, 2012). The three-way interaction

was statistically significant for all outcomes, but in the opposite direction than expected (Figure 2-6). Thus, the hypothesis was not supported. Individuals with higher incomes who are environmentally concerned and reduce their consumption appear to experience the highest levels of happiness, worthwhileness and life satisfaction. For low-income individuals who simultaneously held high environmental concern and reduced consumption, the relationship with SWB was often negative or least positive. High-income participants may experience consumption reduction as a voluntary, self-determined choice that expresses their values, thereby enhancing autonomy, control, and meaning, all of which are known to support well-being.

By contrast, for lower-income individuals, reducing consumption may be more tightly tied to financial necessity than to environmental motivations. The positive impact of consuming less on well-being is likely driven by a conscious choice to do so. A qualitative study in which participants were instructed to consume less reported negative well-being outcomes (McGouran & Prothero, 2016). Being forced to reduce consumption for financial reasons may produce negative outcomes and because the analyses rely on cross-sectional data, no causal inferences can be drawn regarding the direction of these effects. Meaning it could be possible that the participants of the PANs sample simply reduced their consumption for financial reasons.

Notably, a pattern where eudaimonic and hedonic aspects of SWB increase while anxiety also rises also emerged in the moderated moderation analyses. This may partly reflect socioeconomic differences: higher income is typically associated with higher education, and education in turn is linked to greater knowledge and awareness of environmental problems (FritzRoy & Nolan, 2020; Hoekstra et al., 2024). As a result, high-income individuals who reduce their consumption may simultaneously experience enhanced meaning and satisfaction from acting in line with their values yet also heightened anxiety about future environmental developments due to the awareness of ecological risks.

4.1 Practical implications

The present findings offer several practical implications for policymakers and practitioners promoting sustainable lifestyles. The results support the so-called double dividend of reduced consumption in higher-income groups: individuals who are concerned about the environment and actively reduce their consumption tend to report higher life satisfaction, happiness, and feelings of worthwhileness while decreasing their carbon emission (Blackburn et al., 2024; Herziger et al., 2020). Messages aimed at more affluent households may encourage reduction behaviours when they present consumption changes as voluntary and beneficial for the environment, as well as their own well-being, rather than as a form of sacrifice. However, the same approaches may not produce similar psychological benefits for lower-income groups, for whom reducing consumption is more likely to feel financially restrictive. Practical initiatives should therefore combine environmental messaging with measures that maintain or improve material security, such as social protection or affordable sustainable alternatives,

to ensure that the combined benefits for sustainability and SWB are not limited to those with greater resources. Furthermore, it may be valuable to consider the impact of reduction behaviour on SWB as a multidimensional rather than a unidimensional effect. While people may benefit from reducing their consumption, especially for affluent groups it may still impact their recent level of anxiousness.

5. Conclusion and Limitations

Drawing data from the PANs provided a large representative sample size. This allowed the study to contribute evidence to the existing literature using a nationally representative sample of the UK population. However, I relied on the existing PANs questionnaire scales, which poses limitations related to operationalization and conceptual clarity. In particular, the reduced consumption scale does not represent a single low-consumption lifestyle such as voluntary simplicity, but rather captures a heterogeneous set of pro-environmental behaviours involving consumption reduction. Although reductions in water and energy use are typically included in voluntary simplicity scales, reductions in meat consumption are not (Rich et al., 2020). Meat consumption may therefore operate through different psychological and structural mechanisms. Future research may benefit from treating meat reduction separately or excluding it altogether, as additional confounding factors such as cultural norms, health motivations, or price sensitivity may influence its relationship with environmental concern, income, and SWB.

Another common limitation concerns the use of cross-sectional data, which prevents the drawing of causal conclusions. For example, it remains unclear whether individuals reduce their consumption due to limited financial resources or because of environmental concern. This distinction may be particularly important for SWB outcomes like satisfaction and happiness, as the positive effects of reduced consumption are likely tied to its voluntariness. Experimental or longitudinal studies across different income groups could help disentangle these mechanisms and clarify the direction of effects found in this study.

A third limitation is the skewed distribution of environmental concern. Only a small proportion of participants reported low concern. While this pattern reflects a high environmental awareness, it also poses statistical challenges, particularly when interpreting effects at the lower end of the concern scale where the data is spare.

This study aimed to disentangle the connections between environmental concern, reduced consumption, and income across several SWB outcomes. To do so, I examined a weighted moderated moderation model in which conscious reductions in material goods, water, meat, and energy use were tested across low-, medium-, and high-income groups. In our results, environmental concern did not appear to have a negative effect on any of the SWB outcomes, and once reduced consumption was included in the

model, its effect became mostly non-significant. Therefore, the behavioural component had a stronger impact on SWB than attitudes toward the environment.With the exception of anxiousness, reduced consumption did not function as a moderator, but rather as an additional predictor. Similarly, income emerged as a strong predictor for all outcomes. Although the three-way interactions were statistically significant, the interaction did not align with the expected pattern. Across all SWB outcomes, the high-income group that both reduced their consumption and expressed environmental concern reported the highest SWB. No meaningful differences emerged when comparing material reduction with reductions in resource-related domains.

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Erklärung zur Verwendung von Künstlicher Intelligenz (KI)

Hiermit erkläre ich, dass ich die folgenden KI-Hilfsmittel zur Erstellung meiner [Seminararbeit, Bachelorarbeit, Masterarbeit etc.] mit dem Titel [Titel der Arbeit] verwendet habe. Ich versichere, dass die Kennzeichnung der verwendeten KI-Hilfsmittel vollständig ist, inkl. Verwendungszweck, Produktname, als auch ggfs. Prompts und Outputs des KI-Hilfsmittels. Ich verantworte die Auswahl und die Übernahme sämtlicher Ergebnisse der von mir verwendeten KI-Hilfsmittel vollumfänglich selbst.

Verwendungszweck*	**Produktname des KI-Hilfsmittels**	**Ggfs. Prompt (Input) und Output des KI-Hilfsmittels**
[Verwendungszweck, z.B. Schreiben, Literaturrecherche, statistische Analyse]	[z.B. ChatGPT, Copilot, Gemini]	[z.B. A1; die Anhänge mit Verweis auf den entsprechenden hier angegebenen Code am Ende dieses Dokuments anfügen]
Literature research	Elicit	"Which studies are there about the connection of environmental concern and wellbeing?" "Which studies are there about the connection of reduction behaviour and wellbeing"
Statistical Analysis	Chatgbt	"How can I analyze the PROCESS model 3 in r studio?" "What is the code for a moderating moderation in r?" "Can you give me a code for an interaction figure?" "Which package do I need to conduct a multiple regression with weights?"
Writing	Chatgbt	"Can you leave the content the same but slightly improve language and grammatic" "Is my result paragraph APA7 conform?

* Hilfsmittel zur Überprüfung von Grammatik und Rechtschreibung oder der automatisierten Erstellung des Literaturverzeichnisses sind von dieser Erklärung ausgenommen.

Appendix A

Deutscher Abstract:

Der Klimawandel und andere Umweltprobleme stellen zunehmende Bedrohungen für ökologische Systeme und das menschliche Wohlbefinden dar. Die Sorge um die Umwelt kann mit negativen Wohlbefinden korrelieren. Jedoch könnte die Ausübung umweltfreundlicher Verhaltensweisen, wie die Reduktion des eigenen Konsums, diesen negativen Effekt abmildern oder sogar umkehren. Diese Studie untersucht, wie Konsumreduktion in verschiedenen Domänen mit dem subjektiven Wohlbefinden zusammenhängt und ob das Einkommen diese Zusammenhänge moderiert. Unter Verwendung von Querschnittsdaten der britischen People and Nature Survey (N = 18.721) werden die Zusammenhänge zwischen Umweltbesorgnis, selbstberichteten Konsumreduktionen, Einkommen und vier Wohlbefindensindikatoren – Lebenszufriedenheit, Glück, Angst sowie dem Gefühl, dass das Leben sinnvoll ist, untersucht. Dafür wurden gewichtete multiple Regressionsanalysen und moderierter Moderationsanalysen in R ausgewertet.

Die Ergebnisse zeigten, dass ein reduzierter Konsum positiv mit Lebenszufriedenheit, Glück und dem Gefühl der Sinnhaftigkeit des Lebens assoziiert war, gleichzeitig jedoch auch mit höherer Angst einherging. Umweltbesorgnis war in erster Linie mit erhöhter Angst verbunden und zeigte schwache oder inkonsistente Zusammenhänge mit positiven Wohlbefindensindikatoren, sobald das Reduktionsverhalten berücksichtigt wurde. Entgegen den Erwartungen moderierte eine Konsumreduktion nicht den Zusammenhang zwischen Umweltbesorgnis und subjektivem Wohlbefinden. Das Einkommen spielte jedoch eine bedeutende Rolle: Eine dreifache Interaktion zeigte, dass umweltbesorgte Personen mit höherem Einkommen, die ihren Konsum reduzierten, die höchsten Werte in Glück, Sinnhaftigkeit und Lebenszufriedenheit berichteten.

Diese Ergebnisse legen nahe, dass eine Reduktion des Konsums das positive Wohlbefinden steigern, zugleich jedoch Ängstlichkeit erhöhen kann. Darüber hinaus scheinen die psychologischen Vorteile einer Konsumreduktion vom sozioökonomischen Kontext abzuhängen, was die Bedeutung der Berücksichtigung des Einkommens bei der Förderung nachhaltiger Lebensstile unterstreicht.