Are Environment Versus Economy Trade-Off Questions More About Environmental or Economic Attitudes?

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Abstract

Environmental-economic trade-off questions are commonly used in survey research as they enable respondents to indicate their environmental protection support in the presence of scarce resources. Thus, they may capture attitudes that are directly related to actual support for the implementation of environmental policies. However, research is lacking on whether these questions primarily capture environmental attitudes or are actually picking up more on the economic dimension of the trade-off. Using data from the British Election Study, this note finds that such questions are primarily measures of environmental protection attitudes. Thus, such measures can be used in survey research to capture environmental protection preferences and, substantively, the findings also suggest that citizens' environmental attitudes are separable from their broader economic attitudes.

KEYWORDS: British Election Study, economic attitudes, environmental attitudes, Great Britain, political values, question validity

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There are many research questions that seek to examine the effects of individuals' environmental protection preferences. In electoral research, these are especially important given findings that the traditional left-right dimension is insufficient for fully explaining party preferences and voting patterns and that different 'cultural' values – such as environmental values – should be taken into account (Knutsen 2017; Langsæther 2019). Equally, there is still a debate on the factors that influence individuals' support for environmental protection itself. To answer such questions, it is necessary to have valid measures of environmental protection support.

Environmental protection support has not one but many dimensions. These include supporting the principle of addressing environmental problems, being willing to make personal sacrifices for the environment and undertaking political action for the environment. These dimensions are not equivalent and the measure one uses may affect one's results (Dietz, Stern, and Guagnano 1998).

This note focuses on a trade-off dimension of prioritising action on environmental protection over the economy. As societal resources are limited, it is through such trade-off measures that one can draw out individuals' prioritisation of environmental protection in the presence of scarce resources (Diekmann and Franzen 1999). However, it has not been established whether in this trade-off dimension environmental preferences are coming through or whether one could predict respondents' answers to this question based on attitudes towards the other part of the trade-off. This reflects a broader issue with environmental trade-off questions as Klineberg, McKeever & Rothenbach (1998, 737) remarks on a related trade-off, "The consistent differences between liberals and conservatives on these [trade-off] items may have at least as much to do with their reactions to increased government intervention in general as with differences in their concerns about environmental issues per

se". Thus, investigating whether environmentalism is captured in trade-off questions is important due to its implications for the validity of such measures.

The question is investigated using British Election Study (BES) internet panel data. The BES has been chosen as it has a large, national sample[1] and contains environmental protection measures in addition to a range of other attitudinal questions that tap into the economic dimension of the trade-off. With the analysis demonstrating that the environmental trade-off questions are valid measures of environmental protection, this dataset contains a wealth of measures upon which future work can test important hypotheses relating to the prioritisation of environmental protection.

Literature

Questions on environmental protection were almost completely absent from public surveys until the mid-1960s, reflecting the low level of societal salience given to the issue. The earliest questions tended to focus on the perceived seriousness of the issue and the amount of attention government should give it (Dunlap 1991). It was not until the 1970s that explicit trade-off questions presenting a trade-off between environmental protection and the macro-economy started to be asked. These were initially in the form of a binary statement in which respondents chose an issue priority, such as this question asked by Cambridge in the United States from 1976, "Which of these two statements is closer to your opinion: We must be prepared to sacrifice environmental quality for economic growth. We must sacrifice economic growth in order to preserve and protect the environment" (Dunlap 1991, 294/295). The asking of such questions came at a time when the previously accepted inherent benefit of economic growth started to be questioned due to the realisation of its undesirable environmental effects (Inglehart 1981, 895). While work also existed that compared environmental protection concerns and the dominant social paradigm of concern for various social, political and economic needs by measuring these two concepts on separate Likert scales, it was in the work of Cotgrove (1982) where such items were first placed opposite

each other on the same scale and individuals had to indicate their relative priority (Dunlap 2008, 8). While the exact phrasing has since evolved, such questions have been commonly adopted in survey research and these questions are the focus of this current study.

These trade-off measures may allow one to understand the degree of prioritisation a respondent gives towards environmental protection, especially when it is unfeasible to include a larger battery of questions to compose scales such as the New Environmental/Ecological Paradigm Scales (Dunlap, Van Liere, Mertig and Jones 2000; Dunlap 2008) or when one wants to ensure that one is capturing a single dimension. Indeed, Daniels, Krosnick, Tichy and Tompson's (2012, 462) - who identify 16 different categories of environmental survey questions - evidence leads them to conclude that "each [environmental] measure has integrity and would be best examined on its own, rather than combined with other measures into indexes seeking to describe higher-order constructs". In examining the environmental trade-off measures, previous literature has noted that one does not know whether responses are being given primarily in response to the opposing dimension (Klineberg, McKeever, and Rothenbach 1998).

Rather than examining how patterns to these questions relate to patterns in questions that capture the non-environmental element of the trade-off, research has focused on whether different socioeconomic or societal characteristics explain the various environmental measures differently through regression analysis (Dietz, Stern, and Guagnano 1998; Diekmann and Franzen 1999; Dunlap and Mertig 1995; Klineberg, McKeever, and Rothenbach 1998). These studies make a substantial contribution as they display the multifaceted nature of environmental attitudes and behaviours by showing how certain factors may be significantly related to some dimensions but not others. By doing so, they illustrate that different environmental measures are not necessarily equivalent.

Despite this, they do not further our understanding of whether environmental trade-off questions capture more of the environmental or economic dimensions, as they do not show which element of the trade-off is the most prominent for respondents when answering them. Additionally, there are issues with some studies – as Dunlap & Jones (2002) point out – where they not only vary the expression but also the topic of environmental concern[2], and thus one cannot know whether it is the expression or the topic of environmental concern that is at work.

This note assesses the validity of environmental trade-off questions. As Carmines and Zeller (1979, 12) note, "An indicator of some abstract construct is valid to the extent that it measures what it purports to measure". If environmental trade-off questions predominantly capture respondents' economic attitudes, then this would deem them an invalid indicator of environmental protection preferences. Equally, validity is a question of degrees and so the questions would be deemed a non-valid measure of environmental protection preferences if they were found to *only* measure the non-environmental dimension of the trade-off. Thus, the primary concern of this note is to assess the construct validity of such questions for measuring environmental attitudes.

Data & Methods

This note uses the wave 7 panel data of the 2014-2023 BES which was fielded online through YouGov from 14th April to the 4th May 2016 (Fieldhouse et al. 2016b). It contains a total sample of 30,895 individuals and a core sample of 22,337 individuals, the latter of which I use as it is more representative when analysing the data as a stand-alone cross-sectional wave. One issue with the data is that respondents are more politically interested than the population as a whole (Mellon and Prosser 2017). To deal with this, I combine the survey weights provided with weights created to match the national level of political interest. With the data being collected in 2016, the target data is taken from both the 2015 and 2017 BES face-to-face surveys which are nationally representative using the average responses

between these two years to a question asking on a scale of 0-10 "How much attention do you generally pay to politics" (Fieldhouse et al. 2016a, 2018) which was also asked in wave 7 of the panel data[3].

Wave 7 was chosen as it is the only wave to concurrently contain three environmental questions. Having a multitude of environmental measures is desirable to robustly test not only how they behave with other measures, but also whether each environmental protection measure coherently relates to the others. These questions are similar to environmental questions commonly asked in survey research more generally.

Within the dataset, I utilise sets of questions that aim to capture three additional dimensions. The first two – financial/economic hardship and redistribution preferences - relate to the economic dimension. Meanwhile, even if the environmental questions are found to be distinct from these, it is possible that they may primarily be capturing a libertarian dimension, with previous research finding that libertarians are more likely than authoritarians to support environmental measures (Flanagan and Lee 2003). Thus I also utilise a set of libertarian questions. At the same time, though libertarian and environmental individuals share some of the same characteristics – for instance being younger and more educated (Flanagan and Lee 2003; Gifford and Nilsson 2014) - there is evidence that environmental orientations are distinct from libertarian orientations (Knutsen 2017, 14). Thus, there are good grounds to expect that environmentalism should not load onto a libertarian dimension. I will now detail the questions being used, with the exact question wordings and breakdown of responses contained in the appendix[4].

ENVIRONMENTAL QUESTIONS

The first environmental question asks respondents to place themselves on a scale from 0 "economic growth should have priority" to 10 "protecting the environment should have priority" which makes the policy level trade-off explicit. The second environment question asks respondents to place themselves on a scale from 1 "environmental protection has gone

much too far" to 5 "environmental protection has not gone nearly far enough". As most people agree that protecting the environment is desirable (Clarke, Sanders, Stewart and Whiteley 2009, 5), going too far could reasonably be understood as too much money being spent on the issue that could be spent elsewhere rather than people considering that the environment is in too good of a condition. Both of these questions focus on the same topic of general "environmental protection".

The third environmental question asks a subset (25%) of respondents about their belief in climate change with the categories being (1) not changing, (2) changing but not due to human activity and (3) changing due to human activity. While a belief question that focuses on a different topic, it is an indicator of environmentalism but one without an economic or trade-off dimension. Thus, if the initial environmental questions capture environmental dispositions, one would expect them to correlate reasonably with this climate question. It should also be noted that all three of these questions were asked in different parts of the survey.

FINANCIAL/ECONOMIC HARDSHIP QUESTIONS

The questions used to capture hardship are divided into personal and macro-economic hardship. For personal hardship, the first two capture respondents' expected risk of experiencing poverty and unemployment over the next 12 months. The third question focuses on retrospective changes in household financial conditions. To capture perceived macro-economic hardship, I use questions measuring perceived changes in the cost of living, whether it is a good time to buy major household items and current macro-economic evaluations. Each of these questions have been coded so that the highest values represent the greatest hardship.

REDISTRIBUTION QUESTIONS

The first three respectively ask whether cuts to local services, public spending in general and the National Health Service (NHS) have gone too far. Next, I use a question on

whether the government should make greater efforts to address income inequality. Lastly, I use a scale composed of five elements that captures the socialist-Laissez Faire dimension – often referred to as the left-right dimension (Evans and Heath 1995, 191) - using an index composed of five elements. This scale has been shown to have high levels of both reliability and validity and to perform better than questions asking respondents to self-place themselves on a left-right scale as a substantial percentage of respondents understanding of what the scale means differs from the social science understanding (Evans, Heath, and Lalljee 1996, 98/99). Each of the redistribution questions are coded so that the highest value reflects the greatest support for redistribution.

LIBERTARIAN QUESTIONS

Three questions measure attitudes towards immigrants and asylum seekers with previous research finding that libertarians are more favourable towards immigrants than authoritarians (McLaren and Johnson 2007). The first question asks whether immigration undermines or enriches Britain's cultural life. The subsequent questions ask whether more or fewer immigrants and asylum seekers respectively should be allowed into Britain. Next, I use a libertarian-authoritarian scale derived from five individual measures. Finally, I use a measure that taps into respondents' sense of European identity, with libertarians having been found to identify more strongly than authoritarians as European (Patterson and Sobisch 1994). Each of the libertarian questions are coded so that the highest value reflects the greatest degree of libertarianism.

The note proceeds as follows to examine whether a distinct environmental dimension emerges. Firstly, I run a number of Pearson correlation tests to assess correlation patterns at the bivariate level. I then carry out exploratory factor analysis using the principal factoring method and a Kaiser normalisation rotation is carried out to assess what latent factors emerge. This is followed by confirmatory factor analysis. As the climate change belief question was only asked to a proportion of respondents, the factor analysis is carried out both

with and without this question. In all of the analysis - unless otherwise stated - where respondents have answered "don't know" this has been treated as missing data.

Results

The bivariate relationships between the environmental questions themselves and each of the individual questions within the financial hardship, redistribution and libertarianism categories are examined[5]. Firstly, the two environmental protection questions correlate at a decent level with each other at 0.47[6]. There is also a much higher correlation between belief in climate change and considering that environmental protection has not gone far enough than there is between belief in climate change and prioritising environmental protection over economic growth[7]. Meanwhile, each of the environmental questions are very weakly correlated with each of the hardship and the redistribution questions. The hardship questions themselves vary in the strength of their relationship to each other – with the highest being 0.46 between feeling at risk of falling into poverty and of becoming unemployed – but the direction of their relationships to each other is as expected. All of the redistribution questions also correlate at a moderate to strong level with each other. These results thus indicate that the environmental trade-off questions are not primarily capturing the hardship or redistribution element of the trade-offs, but instead represent a separate environmental dimension.

The libertarian questions correlate more steadily with the environmental questions than either the financial hardship or the redistribution questions. However, the correlation coefficients – varying from 0.15-0.27- are still at a lower magnitude than that seen between the environmental questions themselves. The libertarian questions also correlate more strongly with each other - with correlation coefficients of between 0.29-0.76 - than they do with the

environmental questions. This is as one would expect if the environmental questions capture a distinct environmental protection dimension.

While these crosstabulations appear to show that the environmental questions are capturing a distinct environmental protection dimension, to more robustly test this, exploratory factor analysis with a Kaiser normalisation rotation is carried out. In Table 1, one sees the results from the rotated factor loadings for the questions when the climate change belief question is excluded[8]. Both factors 1 and 2 have a similar variance. Factor 1 is a libertarian factor while factor 2 is as a redistribution factor. It is notable that the libertarian factor has both of the environmental questions at approximately double the loadings than for the redistribution questions. Though this points to the environmental questions correlating more with a libertarian dimension, the loadings on this dimension for the environmental questions are still much lower than for the pre-identified libertarian questions and thus that the libertarianism is distinct from environmentalism[9].

The third factor is a financial/economic hardship factor. The environmental questions have the lowest loadings on this factor which strongly indicates that they are not merely picking up on an economic or financial dimension. It is however worth noting that – though still very low – the environment versus economy question loads higher on this than the environmental protection has not gone far enough question by a magnitude of 0.06. Finally, an environmental protection factor emerges as factor 4. In this factor, both the environmental protection questions emerge with high loadings, while all other questions load weakly onto this factor.

[INSERT TABLE 1 HERE]

Additionally, I carry out a confirmatory factor analysis to further test the appropriateness of this four-factor model. This is displayed in Table 2. The loadings of each

of the questions on each of the theoretically pre-determined factors is consistent with the findings from the exploratory factor analysis. The model has a good fit, with an SRMR below 0.08 and a high coefficient of determination. The covariance between the environmental factor and each of the redistribution and hardship factors is weak, and while the covariance between it and the libertarian factor is stronger – as would be expected – it is still only at a moderate level. Furthermore, if the environmental questions are instead specified as being part of any of the other dimensions in three factor models, the models where it is specified as being part of the redistribution or financial/economic hardship factors respectively have an SRMR above 0.08 and the SMRM for the model where it is specified as being part of the libertarian factor – while below 0.08 – is notably higher than when these environmental questions are specified as a fourth, unique factor. Thus, this confirmatory factor analysis strengthens the case for the validity of environmental trade-off questions for capturing individuals' environmental protection preferences. While both the exploratory and confirmatory factor analyses use weighted data, the same conclusions are drawn when using unweighted data[10]. Additionally, when similar analysis is carried out on wave 4 of the data, similar findings emerge[11].

[INSERT TABLE 2 HERE]

One potential concern is that the results may be biased by the responses dropped due to the collective number of "don't know" answers across the eighteen questions[12]. To address this, I have used maximum likelihood with the expectation-maximization (EM) algorithm approach to impute the values of the missing variables and carry out exploratory factor analysis[13] (Graham 2008) as well as using the maximum likelihood for missing values method to compute a confirmatory factor analysis. Tables A36 and A37 in the appendix show that the results remain robust when these are carried out.

One cannot overlook the possibility that certain subsets may interpret the questions differently. For instance, it may be that higher income individuals latch onto the environmental element whereas lower income individuals latch onto the financial dimension. To test this, I carried out exploratory factor analysis sub-dividing the units by education (maximum of a secondary education; university education), self-identified class (lower; middle), partisanship (Conservative; Labour; Liberal Democrat) and income (<£25,000; £25,000-£49,999; >£50,000). In each case, the same four factors emerged.

I additionally carried out the factor analysis adding the climate change belief question on the sample who were asked this question (see Table A38 and A39 in the supplementary appendix) which results in the same four factors emerging with the climate change belief question loading onto the environmental factor.

Conclusions

This research set out to assess the validity of environmental protection trade-off questions for capturing individuals' environmental protection preferences. With individuals having to rank their prioritisation of the environment against their prioritisation of other competing societal aims, it has been unclear whether these questions are truly tapping into a dimension of environmental concern or if they are picking up to a large extent on the economic dimension. Analysis of the BES data strongly suggests that such questions do primarily capture environmental concern and that the questions thus have construct validity. The two main environmental protection questions contained in the survey correlate decently with each other while correlating weakly with perceptions of financial hardship and preferences towards redistribution, in addition to a weak to moderate correlation with libertarianism. This interpretation of a separable environmental protection dimension is further strengthened by both exploratory and confirmatory factor analysis.

The importance of this finding is that, as one is able to accept that these measures are capturing environmental protection preferences, then one can safely use them as valid

explanatory and response variables to investigate various questions regarding the role of environmental attitudes. Substantively, it also suggests that citizens' environmental attitudes are separable from their economic attitudes. While this pertains to the BES, it should also apply to other surveys in similar contexts where such questions are asked. This does come with the caveat that "construct validation ideally requires a pattern of consistent findings involving different researchers using different theoretical structures across a number of different studies" (Carmines and Zeller 1979, 24). Thus, it is advisable for further research to be carried out on other datasets across both time and region to assess the generalisability of these findings. Additionally, future research should apply similar analyses to examining environmental trade-off questions where the focus is on individual trade-offs.

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Footnotes:

[1] The sample also combines active sampling with post-survey statistical weights to aid representativeness

[2] Different environmental topics could include nature, pollution, toxic waste and so on.

[3] See Table A1 in the appendix for further details on how this weight was calculated.

[4] See Tables A2-A22

[5] The Pearson correlation coefficients are displayed in Tables A23-A25 in the supplementary appendix. While Spearman's rank correlation tests may be deemed more appropriate, the use of Pearson's correlation tests allows me to utilise survey weights provided. Given the very large sample size, one would not expect that these tests would provide very different correlation coefficients. As a robustness check, I have

carried out the correlation tests on the unweighted data using both Pearson's and Spearman's rank correlations tests and this confirms that both provide almost identical results.

[6] Table A26 in the supplementary appendix displays a full crosstabulation between the answers to these two questions. Additionally, Tables A27-A29 in the supplementary appendix and the associated discussion examines the stability of both of these questions, with the results showing that the question shows overtime reliability,

[7] A test of equality between these two correlation coefficients produces a z score of 4.91 at p=0.00

[8] Four factors are retained in the rotation following the production of scree plots that suggest this is the optimal number. The scree plots can be found in figures 1 and 2 in the supplementary appendix.

[9] If the exploratory factor analysis is run in which the component questions of the libertarian-authoritarian scale are used instead of the scale as a whole, a unique environmental factor still emerges. The main difference is that the libertarian factor splits into one factor composed of these five component parts and another factor that combines the immigration, asylum and Europeanness questions.

[10] See Tables A30 and A31 in the supplementary appendix.

[11] The exact same analysis cannot be carried out on another wave of the BES data due to all of the same questions not being asked concurrently. However wave 4 (Fieldhouse et al. 2015) which was carried out in March 2015 contains the main two environmental protection questions as well as all of the questions that capture economic hardship and redistribution attitudes, though it is missing some of the questions capturing the libertarian dimension. Table A32 and A33 in the supplementary appendix carry out the same exploratory and confirmatory factor analysis respectively as carried out in Tables 1 and 2 but for the wave 4 data with the only difference being that the libertarian questions are not included. The results confirm that an environmental factor still emerges as a distinct factor. If the five components of the libertarian-authoritarian scale are added to the factor analysis (see Tables A34 and A35 in the supplementary appendix) the results also remain robust.

[12] The tabulations in the appendix display the percentage of "don't know" responses for each individual question.

[13] The attention respondents pay to politics was used as the auxiliary variable.