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Corresponding Author: Dr. Christopher Robert Jones, Ph.D.

Corresponding Author's Institution: University of Sheffield

First Author: Christopher Robert Jones, Ph.D.

Order of Authors: Christopher Robert Jones, Ph.D.; Daphne Kaklamanou; Lambros Lazuras

Abstract: Recent definitions of energy security have evolved to include qualitative dimensions, such as social acceptability, alongside more classic issues such as the availability and affordability of energy supplies. Despite the importance of lay-public opinion in shaping energy and environmental policy, however, currently relatively little is known about the underlying nature of people's attitudes towards energy security. The current study used an online survey to gather perceptions of energy security in samples from two neighbouring countries with a historical reliance on energy imports (i.e. Greece & Turkey). There was a specific focus on understanding the relationships between individuals' pro-environmental and pro-cultural orientations and their energy security concerns. The results not only confirm the multifaceted nature of energy security attitudes but also indicate that the extent and nature of this concern (both in general and in terms of a number of sub-facets of concern) differs between populations. While pro-cultural orientations were not predictive of concern in either subsample, pro-environmental orientations were (e.g. for concerns about fossil fuel depletion within the Greek subsample). This research contributes to the current literature pertaining to the nature and antecedents of lay-public opinions of energy security and provides a footing for further systematic investigation into this area.

Public perceptions of energy security in Greece and Turkey: Exploring the relevance of pro-environmental and pro-cultural orientations

Christopher R. Jones[a,*], Daphne Kaklamanou[b], Lambros Lazuras[b]

[a,] *Corresponding author

Environment & Behaviour Research Group, Department of Psychology, Cathedral Court, University of Sheffield, Sheffield S1 2LT, United Kingdom

c.r.jones@sheffield.ac.uk

+44 (0)114 222 6592

[b] Department of Psychology, Sociology and Politics, 42 Collegiate Crescent, Collegiate Campus, Sheffield Hallam University, Sheffield, S10 2BQ, United Kingdom

Energy Research and Social Science

Abstract

Recent definitions of energy security have evolved to include qualitative dimensions, such as social acceptability, alongside more classic issues such as the availability and affordability of energy supplies. Despite the importance of lay-public opinion in shaping energy and environmental policy, however, currently relatively little is known about the underlying nature of people's attitudes towards energy security. The current study used an online survey to gather perceptions of energy security in samples from two neighbouring countries with a historical reliance on energy imports (i.e. Greece & Turkey). There was a specific focus on understanding the relationships between individuals' pro-environmental and pro-cultural orientations and their energy security concerns. The results not only confirm the multifaceted nature of energy security attitudes but also indicate that the extent and nature of this concern (both in general and in terms of a number of sub-facets of concern) differs between populations. While pro-cultural orientations were not predictive of concern in either subsample, pro-environmental orientations were (e.g. for concerns about fossil fuel depletion within the Greek subsample). This research contributes to the literature pertaining to the nature and antecedents of lay-public opinions of energy security and provides a footing for further systematic investigation into this area.

Keywords: Energy security; Attitudes; Culture; Environment

Highlights

- Public opinion can affect policy decisions relating to energy security issues
- This study investigates energy security attitudes in Turkish and Greek participants
- The findings confirm the multifaceted nature of energy security concern
- The extent and nature of energy security concern differs between the subsamples
- Pro-environmental orientation (NEP) is a good predictor of concern in some contexts

"Given the complex, political nature of energy security, emerging energy security challenges, and differing socio-economic attitudes, it is important to understand the social and environmental factors that shape perceptions towards energy security" [1], p.620)

1. Introduction

1.1 What is energy security?

Energy security is a complex phenomenon. While in essence it can be construed as ensuring the "uninterrupted availability of energy at an affordable price" [2], the banality of this statement masks hidden depths. For example, not only are there differences in the short- and long-term challenges of fostering energy security (e.g. responding to fluctuations in supply and demand vs. ensuring timely investment in energy infrastructure projects); but it is also shaped by manifold factors (e.g. geopolitics, markets, etc.) and the relative success or failure of attempts to ensure energy security can have significant socio-economic and environmental ramifications. For an introduction to the concept of energy security, see [3,4].

The multifaceted and polysemic nature of energy security means that the concept has many possible meanings and takes on "…different specificities depending on the country (or continent), timeframe or energy source to which it is applied" [5], p. 893). While definitions of energy security have historically focused on the availability, reliability and affordability of energy [6,7] there is a growing recognition that the concept is more nebulous. In line with this understanding, more recent definitions have become more inclusive; recognising not only the quantifiable, market-centric roots of early definitions—principally governed by considerations of energy (particularly oil) supply and price—but also more qualitative considerations such as governance and social acceptability [1,5].

The incorporation of social acceptability into the definition of energy security, in particular, is important bearing in mind the reciprocal influences that myriad socio-political, market and community stakeholders (including publics) can exert on energy and environmental policy and decision-making [8–10]. Publics—through their interactions with one another and with the socio-political establishment (e.g. politicians and policy makers)—

are a key group of stakeholders that can shape how energy security is defined within a particular context, and any affiliated energy and/or environmental policy response that follows [see 1]. Indeed, Corner and colleagues [11] note that public opinion "is likely to be one of the most important factors that will determine future technological pathways that […] countries take in the face of climate change and energy security" (p. 4825). With this in mind, it stands to reason that developing an understanding of publics' definitions of and attitudes towards energy security should be a focus of research.

1.2 Public attitudes to energy security

In recognition of the importance that public opinion has in shaping energy and environmental policy and decision-making [8–10]; there is now a developing literature on public attitudes towards energy security [1,11–16]. A primary focus of much of this research has been to assess the implications that concerns about energy security have for energy choices (e.g., the impact that framing the energy debate in terms of energy security has on the relative preference for different electricity generating options). For instance, several studies have found that framing nuclear power in terms of energy security (and climate change) can, if sometimes reluctantly, increase endorsement of the technology [11,17,18].

Another key focus of research in this arena has been to shed more light on regional and cross-cultural variations in energy security attitudes, which has yielded some interesting findings [1,14,16,19]. For example, Knox-Hayes et al. [1] in an investigation of public opinion in 10 diverse countries (including Brazil, Germany, USA, China & Papua New Guinea), discovered notable differences in (a) relative energy security concern; and (b) the regional and social-demographics attributes giving rise to the concern. Three broad findings were registered: (1) the results were seen to confirm the multidimensional nature of energy security and its relationships to both quantitative (e.g. availability) and qualitative (e.g. governance) considerations; (2) relative oil-import dependence was found to strongly shape energy security attitudes and policies, with higher import dependence associated with *less* concern for all aspects of energy security (except availability); and (3) certain socio-demographic characteristics (particularly older age, female gender & lower education) were

found to relate to greater energy security concern. Knox-Hayes et al. [1] concluded that their findings illustrated how attitudes towards energy security are embedded within the specific socio-economic and cultural systems of a given country [see also 20,21].

The literature on lay-public perceptions of energy security is still emerging; however, the extant research indicates not only that research into public attitudes towards energy security is timely—given the influence that public opinion can exert on policies relating to energy security—but also that perceptions of energy security are apparently linked to a number of socio-demographic (e.g. gender, age) and psychosocial factors (e.g. socio-cultural systems). With this in mind, the present study sought to investigate: (1) lay-public perceptions of energy security in samples from two neighbouring countries with a historical and growing reliance on energy imports (i.e. Greece & Turkey); and (2) the specific relationships that two prominent psychological constructs (i.e. pro-environmental and pro-cultural orientations) share with energy security concerns in each of these two countries.

1.3 Pro-environmental orientation and energy security concern

Growing imbalances in energy supply and demand in some countries and the destabilization of the world climate through human activity present challenges for ensuring energy security [e.g. 1,12]. For instance, the rising global demand for, but reducing availability of, fossil fuels to power growing economies—set against the recognised negative environmental consequences of their use—highlights the close, complex and yet sometimes conflicting relationship that can exist between energy and environmental policy. The evident relationships between energy and environmental issues suggest that it would be logical to anticipate that an individual's environmental values, identity, beliefs and attitudes (i.e. their 'pro-environmental orientation') could help to shape (or be shaped by) their concerns about energy security.

A rich literature exists linking aspects of a person's pro-environmental orientation to their environmentally-significant behaviours, including their energy-related behaviours (see, [e.g. 22–25]. Generally, a logical relationship is observed (although the strength can vary and be affected by certain demographic factors) with those evidencing a stronger pro-

ecological orientation tending to be more concerned about the environment and tending to be more likely to engage in pro-environmental actions (e.g. lower energy use).

While it could be argued that the links between pro-environmental orientation and energy security concerns will be: (a) more complex (due to the multi-faceted and polysemic nature of the construct [5]); and (b) likely to be affected by a number of aspects of the physical and socio-political context within which people are situated [e.g. 26,27]; it is reasonable to hypothesise that a similar positive correlation should exist between pro-environmental orientation and energy security concerns in some contexts (i.e. stronger pro-environmental orientations should correlate with higher concerns about energy security).

We reason that this is perhaps most likely in states that are dependent on imported fossil fuels (e.g. oil and gas) and where people conceptualise energy security issues as primarily relating to a choice between: (a) a continued (or growing) reliance on fossil fuel imports via vulnerable supply-lines from countries who have control over the availability, reliability and price of the supplied energy[i]; or (b) a shift towards an increased reliance on domestically-sourced renewable energy. Indeed, there is certainly evidence linking stronger pro-environmental orientations to both preferences for renewable energy options and/or a greater concern about an overreliance of fossil fuels, which would help to support this assertion [e.g. 28–30][ii]

A scale that is seen to encapsulate an individual's pro-ecological orientation is the New Ecological (or Environmental) Paradigm (NEP) [31,32]. While the NEP has been used extensively and variously as a measure of "environmental attitudes, beliefs, values, and worldview" [31, p.428], it is fundamentally believed to capture people's general beliefs about the relationship that humans share with the environment [33]. In essence, higher scores on the scale relate to stronger endorsement of 'eco-centric' beliefs (i.e. the belief that humans are part of, and constrained by, nature) and stronger rejection of 'dominant social' beliefs (i.e. the belief that humans are independent from, and dominant over, nature).

The NEP has been shown to correlate with a number of energy and environmentally-significant behaviours [e.g. 34–36] and the concept has been integrated into models of

environmental behaviour as a key link in the chain between one's underpinning eco-centric/ego-centric values and their personal (i.e. moral) norms and behaviours (e.g. Value-Belief-Norm model, [37]). While some questions do remain over the dimensionality of the NEP [19]; to the extent that it is deemed to capture the essence of people's relationships with the environment, the decision was taken to investigate the strength with which endorsement of the NEP might predict energy security concerns in the current study. Based upon the fact that Turkey and Greece are both fossil fuel import-dependent states (see Section 1.5) and the reasoning that people might construe energy security considerations as a choice between a continuing reliance on (imported) fossil fuels (i.e. unsustainable status quo) and a shift towards a greater reliance on (domestic) renewables (i.e. sustainable future outlook), it was predicted that in the current study that a stronger pro-environmental orientation should relate to stronger concerns about energy security (Hypothesis 1).

1.4 Pro-cultural orientation and energy security concern

There is mounting evidence linking the cultural norms and practices of a given society to their energy supply, demand and use [38–41]; and a growing interest in how perceptions of energy security might vary with culture [20,21].[iii] For example, Sovacool [41]—in a narrative account of the social and cultural barriers to alternative forms of energy supply in the US—concludes that the impediments facing the introduction of renewable and energy efficiency technologies in the country are rooted in the American public's deep-seated cultural beliefs about their entitlements for abundant, low-cost electricity. This has led to a societal preference for the continued production and use of traditional forms of power generation over the introduction of novel, clean energy resources. Similarly, Shove and Walker [40]—from the sociological perspective of practice theory—note the intimate relationship that energy supply and demand share with the social practices of a given population; pointing to the fact that energy is accessed in order to facilitate such social practices (e.g. cooking, commuting) rather than simply for its own sake. Thus, according to social practice theory, understanding energy-society relations rests upon developing a firm

appreciation of how social practices are "enacted, reproduced and transformed" [40, p.48] (see also [42,43]).

In short, the patterns of energy demand, provision and supply in a given society are inherently tied to the social practices of that society; and the social practices and expectations of that society are partially determined by the culture of that society [44]. With this in mind, it is logical to anticipate relationships between culture and energy security concerns; particularly, perhaps, where there are perceived threats to one's cultural energy use practices from an over-reliance on energy imports from unpredictable exporters (c.f. the recent Russia-Ukraine gas disputes [e.g. 45]). Importantly, however, while you might anticipate societal differences in energy security concerns based upon the nature of their energy supply and use practices; at an individual level you might also anticipate that such concern would also be moderated by the extent to which a person subscribes to the values and practices of their pre-dominant culture (i.e. the extent of their pro-culturalism, see [46].

For instance, one might expect that in a culture where practices are strongly tied to energy consumption—which is increasingly the case in many societies [e.g. 47]—that the more that someone were to identify with that culture, the more concerned they would be by issues of energy security. This relationship might be expected to be further strengthened in contexts where countries are heavily reliant on energy imports; as such dependence may serve to threaten intergroup distinctiveness, strengthen in-group (in this case domestic) favouritism and inflate anxieties about an over-reliance on 'outsiders' (i.e. energy exporting countries) (see, e.g., [48]). However, Knox-Hayes et al.'s [1] recent finding that nations that were *more* reliant on energy import were typically *less* concerned about many aspects of energy security (except availability) argues against such a simplistic hypothesis.

An alternative hypothesis, therefore, is that where threat to one's cultural values and practices exists (e.g. from greater import dependence), that a stronger subscription to that culture (i.e. greater pro-culturalism) somehow serves a protective function for a person, thereby reducing concerns. There is certainly evidence from terror management theory [49] that cultural worldviews can provide people with a buffer against existential and other

anxieties “by imbuing life with meaning, structure, and purpose” [50, p.4] and fostering self-esteem and a sense of control [see also, e.g. 51]. On this basis, it would be logical to argue that those who more strongly identify with their culture—largely irrespective of the energy use practice of that culture—should have lower energy security concerns; as their connectedness to culture should help to buffer against their anxieties about the future affordability, availability, accessibility and/or reliability of energy.

Within the present research we sought to clarify the nature of this relationship by investigating how pro-culturalism would relate to energy security concerns in Greece and Turkey. While there are ostensibly competing hypotheses relating to these relationships, on the basis of the ‘anxiety buffer’ hypothesis’ [50], we predicted that stronger pro-cultural identification should correlate with lower energy security concerns (Hypothesis 2).

1.5 The present research

The current article reports on the findings of a survey-based study conducted in 2012 on a convenience sample of adult respondents from Greece and Turkey. The aim was to profile general energy security concerns in each country and then, more specifically, to use regression analyses to showcase the relationships between pro-environmental and pro-cultural orientations and a number of facets thought to underpin general concerns about energy security within each country (i.e. import dependence, sustainability, affordability, reliability, sufficiency and susceptibility to terrorism, see [11]). Importantly, the research did not seek to provide a sociological comparison of the specific cross-national differences in the socio-cultural relationships that publics share with energy (production and consumption); but rather to psychologically examine the extent to which individuals’ tendencies to identify more or less strongly with their culture and the pro-environmental worldviews might affect their energy security concerns.

Greece and Turkey provide an interesting context for investigating energy security. Their energy profiles—and thus the security challenges—are arguably similar in many ways. For example, both countries have falling domestic production of oil and gas, and are thus heavily reliant on imports in order to meet demand [52–54]. In Greece, the primary supplier

of both oil and gas is Russia, with additional supplies coming largely from Middle Eastern (e.g. Iran, Iraq, Saudi Arabia) and North African (e.g. Algeria, Libya) states [53]. In Turkey, Russia is again the primary supplier of gas (with key contributions also coming from Iran, Azerbaijan and Algeria among others); however, while Russia is also a key exporter of oil to Turkey, the primary suppliers are Iraq and Iran [54]. While the absolute reliance on natural gas and oil as primary energy sources has fluctuated in each country in recent years, import dependency for both fuels in both countries is high and has risen markedly. For example, at the time of conducting the current study Turkey had an import dependency of 93.3% for oil and an estimated 98.6% for natural gas; while Greece had an import dependency of 99.5% for oil and 99.9% gas [52]. Moreover, in both countries, this dependency is forecast to increase further in coming years; reaching 94% and 99% for oil and gas in Turkey, and 99.7% and 100% for oil and gas in Greece by 2018 (see Table 1).

In contrast, both countries are net producers of coal (primarily lignite) and harbour considerable domestic reserves (although both countries still import sources of 'hard coal', e.g. from Russia [53,54]). In both countries, coal (both hard coal and lignite) accounts for around 30% of primary energy consumption, principally for use in electricity generation [55]. However, while both Turkey and Greece remain heavily reliant on coal; growing international pressures to reduce CO_2 production from the energy sector has prompted increases in the share of renewables (particularly via hydroelectricity, solar power and wind power) within the energy mix, as well as policies designed to reduce energy demand and increase energy-use efficiency [56].

Table 1.

Demand, percentage import dependency and total proportion of energy supply for Oil and Natural Gas in Turkey and Greece between 1990-2012, plus forecasts for 2018.

			1990	**2000**	**2010**	**2012**	**2018**
Turkey	Gas	Demand (mcm/y)	3,468	14,835	38,127	45,254	59,655

		Import Dependency (%)	93.9	95.7	98.2	98.6	99.0
		TPES (%)	5	17	30	32	-
	Oil	Demand (kb/d)	477.0	662.8	649.8	670.5	745.4
		Import Dependency (%)	84.8	92.0	92.6	93.3	94.0
		TPES (%)	44	40	29	27	-
Greece	Gas	Demand (mcm/y)	123	2,052	3,850	4,354	4,901
		Import Dependency (%)	0	98.2	99.8	99.9	100
		TPES (%)	1	6	12	14	-
	Oil	Demand (kb/d)	314.1	399.2	372.4	317.9	274.6
		Import Dependency (%)	94.6	98.5	99.4	99.5	99.7
		TPES (%)	56	55	51	45	-

Note. Figures taken from Energy Supply Security: Emergency response of IEA countries [52]. TPES = Total primary energy supply; mcm/y = million cubic metres per year; kb/d = 1000 barrels per day. Natural Gas demand, dependency and TPES figures are estimated for 2012.

2. Methods

2.1 Participants and recruitment

Participants were an opportunity sample of Greek and Turkish nationals recruited via social media (i.e. Facebook and Twitter) and via contacts at four universities in Turkey (Koç, Yalova, Hacettepe & Boğaziçi) and two universities in Greece (CITY College, Thessaloniki, and University of Athens) in July 2012. Participants were directed to an online version of a questionnaire-based survey about energy security, with participation incentivized via an optional prize-draw (worth €25/50TL).

A total of 287 participants began the survey (*n* = 168 Turkish; *n* = 119 Greek). Of these, 175 participants (*n* = 104 Turkish; *n* = 71 Greek) completed and submitted the survey (i.e. 61% completion rate). Around two-thirds of the sample were male (*n* = 107, 61.1%), most were educated to at least degree level (*n* = 141, 80.6%). Participants ranged from 16 and 65 years old and on average were in their late 20s (*M* = 28.64 years; *SD* = 7.94 years). The recruitment method used in this study led to a preponderance of undergraduate and postgraduate students within the sample (*n* = 89, 50.9%); however, there were also a large number of non-student participants (*n* = 80, 45.7%) (*n* = 6 chose not to answer). Two-thirds of the sample (*n* = 117, 66.9%) completed the survey within their country of origin; although a number of the participants completed the survey from a different country (*n* = 58, 33.1%).

Fuller details of the participant demographics, including the breakdown for the Turkish and Greek subsamples, are available in Appendix A, Table A.

2.2 The online questionnaire-based survey (QBS)

The online QBS was created and distributed using SurveyGizmo (www.surveygizmo.co.uk). The QBS was initially developed in English and then translated into Turkish and Greek by native speakers. The QBS was then back-translated into English and the original and back-translated QBSs were compared to ensure correspondence between the items. Any necessary modifications were then made to the Turkish and Greek surveys before distribution.

The QBS started with a brief introduction, which provided details of: (a) the rationale behind the survey (i.e. to assess participants opinions of energy security issues); (b) the prize-draw participation incentive (worth €25/50TL); and (c) the ethical protocols for anonymization and data management. The introduction was followed by sections (outlined below) devoted to assessing participants': (a) energy security concerns; (b) environmental worldview and beliefs about climate change; and (c) cultural attitudes. The survey ended with a demographics section and debrief (see Appendix B for full question wording).[iv]

2.2.1 QBS sections

a. **Energy Security Concern:** Concern about energy security was measured using a scale comprising six items derived from [11].[v] These items were selected to represent broad aspects of energy security, namely: (1) dependence on energy imports; (2) long-term sustainability of energy supply (i.e. concern about reliance on fossil fuels); (3) affordability of energy supply; (4) vulnerability of energy supply to disruption by terrorists; (5) sufficiency of energy supply (i.e. concern about energy rationing); and (6) reliability of energy supply (i.e. concern about power cuts). Participants responded on a 4-point scale (1: not at all concerned – 4: very concerned, plus 'don't know' [DK] and 'no opinion' [NO] options). The scale had good internal consistency within the overall sample (Cronbach's α = .84) and within both the Turkish (α = .84) and Greek subsamples (α = .84).

Participants were also asked to list where they felt that their country might import energy from (free response). This provided an indication of the extent to which participants believed that their country was dependent upon other countries for energy, as well as which countries they were reliant upon.

b. **Climate change beliefs and pro-environmental orientation:** Participants were asked if they had heard of climate change (Yes, No, DK) and were then asked to select which of one of 6 statements best reflected their views about the causes of climate change: (1) fully the result of human activity; (2) party the result of human activity and partly the result of natural processes; (3) fully the result of natural processes; (4) mainly the result of human activity; (5) mainly the result of natural processes; or (6) I don't believe in climate change (plus DK and NO).

Concern about climate change was measured using three items taken from Chester (2010) used to assess: (1) general concern about climate change; (2) concern about the personal effects of climate change; and (3) concern about the effects of climate change on society. In each case, participants registered their concern on a 4-point scale (1: not at all concerned – 4: very concerned, plus DK and NO).

Pro-environmental orientation was measured by using the revised New Ecological Paradigm (NEP) scale [31]. Participants were required to rate the extent to which they

agreed or disagreed with each of 15 statements about the relationship between humans and the environment (1: strongly disagree – 5: strongly agree). Even-numbered items were reverse-coded such that higher scores on all items reflected a stronger pro-ecological worldview. The scale had questionable internal consistency within the whole sample (α = .69) and in the Turkish subsample (α = .63) but acceptable internal consistency within the Greek subsample (α = .77). In each case, the reliability of the scale was not improved markedly by the removal of items. As the NEP is an established measure of pro-environmental worldviews, the decision was taken to retain the whole scale in the analysis.

4. **Pro-cultural orientation:** Pro-culturalism was measured using Choi et al.'s [46] 19-item cultural worldview (CW) scale. The scale comprises items assessing: (1) strength of cultural linkages; (2) recognition of cultural values; (3) concern over cultural loss; and (4) desire to preserve traditions and customs. Participants were asked to express their agreement or disagreement with each statement on a 5-point scale (1: strongly disagree – 5: strongly agree). Even items were reverse-coded such that higher scores on all items reflected stronger pro-culturalism. The full scale had good internal consistency for the whole sample (α = .84); was good in the Turkish subsample (α = .86) and acceptable in the Greek subsample (α = .77).

c. **Demographics:** This section assessed participants' gender; age (year of birth), educational level; employment status; annual household income; religion; general political stance (i.e. left, centre, right or other); and specific political party preference (free response). Additional items were included, which asked participants to state whether or not they agreed or disagreed that: (1) their personal financial situation would improve in the next 12 months; and (2) the financial situation of their country would improve in the next 12 months. Responses were made on a 5-point scale (1: strongly disagree – 5: strongly agree).

3. Results

3.1 Turkish vs. Greek sample comparisons

3.1.1 Energy security concerns

Between-subjects t-test comparisons were conducted to identify any differences between the levels of energy security concern shown between the Turkish and Greek subsamples. Overall, Greek participants were significantly more concerned about issues of energy security than the Turkish participants, $t(173) = 2.78$, $p = .006$. This difference was principally due to greater relative concern about the future affordability of energy, $t(168) = 1.68$, $p = .003$, import dependence, $t(164) = 3.08$, $p = .002$, and fossil fuel depletion, $t(160) = 2.60$, $p = .010$; however, the mean scores were higher (although not significantly so) on all items except concern about terrorism. Within both subsamples, import dependence was of most concern, followed by affordability, with terrorism of least concern. For the relevant means and standard deviations for these analyses, see Table 2.

Table 2.

Mean energy security concerns, pro-environmental and pro-cultural orientation and climate change and financial concerns within the Turkish and Greek subsamples

	Turkey	**Greece**	**Sig.**
Energy Security Concerns			
- Affordability	3.01 (0.90)	3.41 (0.71)	.003**
- Rationing	2.85 (0.96)	3.14 (0.93)	.065
- Import Dependence[a]	3.11 (0.97)	3.53 (0.78)	.002**
- Terrorism	2.65 (1.06)	2.49 (1.13)	.392
- Fossil Fuel Depletion	2.81 (0.95)	3.20 (0.98)	.010**
- Power Cuts	2.82 (0.96)	3.07 (0.93)	.090
Overall Mean	2.87 (0.68)	3.15 (0.61)	.006**
Cultural Worldview (CW) scale			
Overall Mean[a]	4.01 (0.58)	3.72 (0.45)	< .001***
New Ecological Paradigm (NEP) scale			

Overall Mean	3.52 (0.42)	3.75 (0.47)	.001***
Concern with Climate Change			
- General concern	3.39 (0.78)	3.42 (0.80)	.756
- Personal impact concern	3.21 (0.79)	3.29 (0.89)	.530
- Societal impact concern	3.28 (0.86)	3.33 (0.79)	.733
Personal and national financial situation			
- Personal (next 12 months)	3.05 (1.11)	2.54 (1.08)	.003**
- National (next 12 months)[a]	2.77 (1.18)	1.80 (0.90)	<.001***

Note: Means exclude DK and those with no opinion. [a] Equal variances not assumed.

Significance = *p < .05; **p < .01; ***p < .001

3.1.2 Pro-cultural orientation

Overall, the full sample averaged a mean score of 3.89 (*SD* = 0.55) on the CW scale, which is significantly above the hypothetical midpoint of the scale (3.00) and means that on average the participants had a strong pro-cultural orientation, t (174) = 21.51, p < .001. Of the subsamples, however, the Turkish participants were significantly more pro-cultural than then Greek subsample on the CW scale, t(170) = 3.61, p < .001. For the means and standard deviations associated with this analysis, see Table 2.

3.1.3 Pro-environmental orientation and climate change concern

Overall, the full sample averaged a mean score of 3.61 (*SD* = 0.45) on the revised NEP scale, which is significantly above the hypothetical midpoint of the scale (3.00) and means that on average the participants were relatively pro-environmental, t (174) = 17.93, p < .001. Of the two subsamples, Greek participants on average had a significantly stronger pro-environmental orientation than the Turkish participants, t(173) = 3.31, p < .001.

Participants in both subsamples were concerned with climate change and its potential for personal and national-societal impacts. General concern, t(173) = 0.31, p < .756, as well as specific concern regarding personal, t(168) = 0.63, p < .530, and societal

impacts, $t(170) = 0.34$, $p < .733$, were statistically comparable between the subsamples. A repeated measures ANOVA revealed that there was a significant difference in participants ratings of concern with climate change when considered at a personal, societal or general level, $F(2, 165) = 6.63$, $p = .002$. This trend was comparable in both the Turkish and Greek subsamples, $F(2, 165) = 0.33$, $p = 719$. Planned simple contrasts (using personal concern as the referent) revealed a non-significant difference between personal and societal concern, $F(1, 166) = 2.56$, $p = .112$, but a significant difference between personal and general concern, $F(1, 166) = 13.30$, $p < .001$. Consistent with a self-serving optimistic bias [e.g. 40], participants in both subsamples had significantly lower personal concern about the impacts of climate change relative to general concern.

3.1.4 Personal and national financial situation

In terms of the anticipated financial situation, the Turkish participants tended to agree that their personal financial situation would improve in the next 12 months; however, Greek participants were more uncertain. In terms of the national financial situation the Turkish participants were uncertain, with the Greek participants relatively confident that things would not improve. The difference between the Turkish and Greek subsamples was significant for both personal, $t(173) = 3.04$, $p = .003$, and national, $t(171) = 6.14$, $p < .001$, outlooks. Again, consistent with a self-serving optimistic bias [57], in both subsamples it was generally the case that people saw the national financial outlook to be more negative than their personal situation. For all the means and standard deviations associated with the above analyses, see Table 2.

3.2 Predicting energy security concerns

The initial comparative analysis revealed that participants in both countries harboured relatively strong concerns about energy security; however, the Greek subsample was generally more concerned than the Turkish subsample, particularly in terms of energy affordability, import dependence and fossil fuel depletion. The analyses also established that there were differences between the subsamples in terms of the apparent strength of their overall pro-environmental (higher in the Greek subsample) and pro-cultural (higher in the

Turkish subsample) orientations, and their beliefs about possible improvements to their personal and national financial situations (both lower in the Greek subsample). In order to see whether these factors would hold explanatory value for (a) predicting general energy security concern and (b) predicting each of the specific sub-facets of energy security where differences were identified between the subsamples (i.e. import dependence, affordability, and fossil fuel depletion), four multiple regression analyses were conducted.

a. General energy security concern: Responses to the NEP scale, the cultural worldview scale (CW) and the question relating to personal 12-month financial outlook (PFO) were used to predict mean energy security concern within each subsample. For the Turkish subsample, the overall model was significant, $F(3, 100) = 5.84$, $p < .001$, *adj.* $R^2 = .124$; although, only the NEP score was retained as a significant predictor ($ß = .36$, $t = 3.87$, $p < .001$). Within the Greek subsample, the overall model was not significant, $F(3, 67) = 2.16$, $p = .101$, *adj.* $R^2 = .047$; but the NEP score did share a significant relationship with mean energy security concern ($ß = .27$, $t = 2.02$, $p = .039$).

b1. Import dependence concern: When the same predictors (i.e. NEP, CW and PFO) were used to predict specific concerns about import dependence, the model was significant for the Turkish subsample, $F(3, 94) = 3.24$, $p = .026$, *adj.* $R^2 = .065$, with the NEP score retained as the only significant predictor ($ß = .30$, $t = 3.05$, $p = .003$). For the Greek subsample, the overall model was not significant, $F(3, 66) = 0.14$, $p = .939$, *adj.* $R^2 = -.039$.

b2. Affordability concern: When the predictors were regressed on specific affordability concerns; the overall model was again significant for the Turkish subsample, $F(3, 97) = 5.17$, $p = .002$, *adj.* $R^2 = .111$, with NEP score retained as the only significant predictor ($ß = .34$, $t = 3.59$, $p = .001$). The overall model for the Greek subsample was not significant, $F(3, 65) = 1.13$, $p = .34$, *adj.* $R^2 = .006$.

b3. Fossil fuel depletion concern: When the predictors were used to predict specific concerns about fossil fuel depletion, the overall model was not significant for the Turkish subsample, $F(3, 89) = 2.15$, $p = .100$, *adj.* $R^2 = .036$; although NEP score did share a significant positive relationship with concern ($ß = .25$, $t = 2.44$, $p = .017$). The model was,

however, significant for the Greek subsample, $F(3, 65) = 13.64$, $p < .001$, *adj.* $R^2 = .358$; with NEP score retained as the sole significant predictor in the model ($\beta = .64$, $t = 6.07$, $p < .001$).

3.3. Beliefs about the origin of import dependence

It was hypothesised that the greater concern with energy security in the Greek subsample (particularly regarding concerns over import dependence) might stem, in part, from uncertainty over where energy was being imported from. As such, the answers to the free response question asking people to list the countries from which they believed their country imported were counted (see Table 3).

Of the 104 Turkish respondents, 65 (62.5%) listed at least one country. The sum total of countries listed by the full Turkish subsample was 148 (Median = 1.0, Range = 0–8 countries). The countries most commonly listed were Russia ($N = 49$); Iran ($N = 36$) and Azerbaijan ($N = 24$). A large number of other countries were listed, with Iraq, Bulgaria and Algeria being prominent examples. These figures indicated that a majority of participants within the Turkish subsample had some self-claimed knowledge of where energy imports were coming from.

Of the 71 Greek respondents, just 35 (49.3%) listed at least one country. The sum total of countries listed by the full Greek subsample was 48 (Median = 0.0, Range = 0–3). The countries most commonly listed were Russia ($N = 19$), Iran ($N = 5$) and the USA ($N = 3$); however, a large number of additional countries (e.g. Italy, Iraq, Turkey) were also mentioned. Also, in contrast to the Turkish subsample, there was a slightly greater reference to generic regions (e.g. Middle East, Arab counties) rather than specified countries ($N = 5$ vs. $N = 1$, respectively). These figures suggested that within the Greek sample, there was comparatively lower self-claimed knowledge of where energy imports were coming from.

A Mann-Whitney U test revealed that the median number of countries named by Turkish participants was significantly greater than the median number named by the Greek participants, $U = 2796.50$, $Z = 2.88$, $p = .004$.

Table 3.

Countries listed by respondents when asked to provide details of where their nation's energy is imported from

Turkey		**Greece (n = 35)**	
Country	**Freq.**	**Country**	**Freq.**
Russia	49	Russia	19
Iran	36	Iran	5
Azerbaijan	24	USA	3
Iraq	12	Other[2]	21
Bulgaria	5		
Algeria	4		
Other[1]	18		
Total number of countries listed	148		48

[1] Other: Syria, Saudi Arabia, Norway, Libya, Turkmenistan, Nigeria (*N* = 2); USA, France, Ukraine, Qatar, Kazakhstan, Arab countries* (*N* = 1)

[2] Other: Italy, Iraq, Turkey, Bulgaria, Arab countries*, Middle East* (*N* = 2); France, Romania, Israel, Algeria, Albania, UAE, Greece, Balkan countries*, Europe* (*N* = 1)

*Note: For summative purposes, generic regions (e.g. Middle East) were given a count of 1.

4. Discussion

The recognized impact that lay-public perceptions of energy security can have on policies regarding matters of energy and environment [8–10], is leading to an increase in research into their nature [e.g. 1,11–13]. The present study used an online survey to investigate lay public perceptions of energy security in samples from two neighbouring countries with a historical and growing reliance on energy imports (i.e. Greece & Turkey). Not only did this study aim to shed light on the relative importance given to a number of facets of concern thought to underpin more general attitudes towards energy security [11];

but it also sought to flag-up how individuals' pro-environmental and pro-cultural orientations might interact with these concerns.

The initial descriptive analyses were insightful for a number of reasons. Not only did they: (a) confirm the anticipated multi-faceted nature of energy security concerns within the sample, exemplified by the different levels of concern expressed towards the different sub-facets of energy security investigated (e.g. concerns about terrorist disruptions to energy supply were low compared to concerns about affordability or import dependence); and (b) present some interesting evidence of self-serving biases in participants' responses (e.g. regarding concerns about the personal vs. societal impacts of climate change); but they also (c) provided a quasi-experimental opportunity to compare how these concerns varied in the Greek and Turkish subsamples.

It is important to note, however, that while the quasi-experimental design of the study did provide an opportunity to directly compare the two subsamples, that results of any such comparison should be treated with caution due to the convenience nature of the sample and the fact that the Greek and Turkish participants were not experimentally matched (e.g. on key demographic variables).

Participants in both countries harboured relatively strong concerns with energy security. This was most notably on the grounds import dependence and the affordability of energy. The threat of terrorist disruption to energy supplies was of least concern in both subsamples; however, there were some between-group differences in the ordering of the other items assessed (i.e. rationing, availability and fossil fuel depletion concerns). Overall, Greek participants were more concerned than the Turkish participants. This difference was most evident in terms of their concerns about import dependence, the future affordability of energy and fossil fuel depletion.

Importantly, the descriptive analyses also highlighted key differences between the subsamples in terms of the strength of their overall pro-environmental (higher in the Greek subsample) and pro-cultural (higher in the Turkish subsample) orientations, and their beliefs about possible improvements in the personal and national economic situations (both lower in

the Greek subsample). The follow-up inferential statistics revealed that pro-environmental orientation, in particular, did have an explanatory impact on energy security concerns; although this influence was different depending upon the subsample and/or specific energy security concern under investigation. Although these findings should be treated with caution bearing in mind the limitations of this study (outlined below), it is clear that in a general sense—and akin to Knox-Hayes et al.'s [1] conclusions—there should be no "one-size fits all" mentality when it comes to understanding and addressing energy security, as the nature of concerns about energy security does appear to vary between populations.

The following discussion seeks to offer explanations for the relative importance of import dependence and affordability concerns, as well as using the results of the inferential analysis to help delineate the differences between the subsamples on these two concerns, plus concerns about fossil fuel depletion. The discussion ends by considering the relative importance of the pro-cultural and pro-environmental orientations in explaining energy security concerns before limitations and future directions are outlined.

4.1 Import dependence concerns

The prominence of concerns over import dependence in both subsamples is logical bearing in mind how dependent both countries are on imports of oil and gas (see Table 1). It was also clear, within the Turkish subsample at least, that these concerns were positively predicted by individuals' pro-environmental orientations. This finding could be seen to relate to the fact that the imported fuels within both Turkey and Greece are primarily high-carbon fossil fuels and so therefore environmentally damaging. However, if this were the case, then one might question why the link between NEP scale scores and concerns about import dependence was not also evident within the Greek subsample. A possible explanation for this finding is discussed further below (see fossil fuel depletion concerns).

The differences in concerns about import dependence between the subsamples could be a product of the fact that Greek participants saw themselves to be perceptively more import-dependent than Turkey. This is on the grounds that significant proportions of oil and gas are transported to Greece via Turkey and thus there is an additional 'import step' for

Greeks to be concerned about. However, there was little evidence of the energy interconnection with Turkey being a source of explicit concern within the Greek subsample. Instead, we argue that differences in concerns about import dependence might hinge upon differences in the participants' subjective certainty as to where energy supplies are imported from. That is, there appears to be some evidence that the Greek subsample were less clear as to where their energy imports come from in comparison to the Turkish subsample, which could be a source of their elevated anxiety (see Table 3).

The implication of this finding is that it is perhaps not an appreciation of being import dependent alone that is the root of greatest anxiety, but rather a recognition of import dependence paired with a lack of certainty as to where the energy comes from that generates most concern. Although tentative and requiring further investigation (e.g. within larger and more representative samples and using a more objective measure of awareness), this conclusion is, to some extent, consistent with the findings of those of Knox-Hayes et al. [1] who found that people living in countries with greater oil inter-dependence showed less overall concern for many energy security issues than those living in more energy *independent* nations. One avenue for future research could be to investigate how awareness of where energy comes from interacts with energy security concerns depending upon the historical, political or regional relationships shared between interconnected trading nations and/or aspects of the domestic energy supply and generation context [e.g. 1,58]. One might anticipate, for example, that a recognised reliance on unreliable exporters could be a source of greater concern than an absence of such awareness in certain contexts (e.g. in the case of the Ukraine-Russia gas disputes [see 45]).

4.2 Affordability concerns

The prominence of affordability concerns within each subsample could be argued to be a product of either the demographic of the participants, the timing of the research and/or more complex reasons pertaining to the participants' rationales for consuming energy. Specifically, the relatively young nature of our sample is likely to mean that, on average, our participants had less disposable income than would be expected from a sample comprising

more full or part time employed individuals. If true, this could have inflated the relative importance of affordability concerns within our sample. Concerns over affordability can perhaps also be tracked to the turbulent economic situation in the region at the time of the research—both countries were recovering in the wake of the 2007-2009 global financial crisis in 2012—and differences in how the countries have dealt with this issue [e.g. 59]. Indeed, the relatively higher concern placed on the issue of affordability within the Greek subsample could be seen to reflect the additional active discussions about Greece's possible withdrawal from the Eurozone (so-called 'Grexit') at the time of the study [see 60].

Importantly, though, personal financial outlook was not a direct predictor of affordability concern in either subsample, which argues against drawing simple conclusions about the prominence of this concern based solely upon worries about the *absolute* cost of future energy. Rather, it is possible that concerns about the affordability of energy emerged due to the anticipated impacts that any price hikes would have upon the *relative* cost of energy as an expense within their lives. That is, although participants thought they would still be able to afford to pay for energy in the future at inflated prices, they were concerned that the additional expense would negatively affect their abilities to engage in desirable social practices by absorbing more of the disposable income. This conclusion is clearly tentative at the current time and is one that we feel warrants further investigation in future research.

4.3 Fossil fuel depletion concerns

While not a primary concern to the Turkish subsample, concerns about fossil fuel depletion were prominent within the Greek subsample. This difference is mostly likely attributable to the apparently stronger pro-environmental orientation shown by the Greek subsample relative to the Turkish subsample; a conclusion supported by the results of the regression analyses, which indicated that 36% of the variance in this item was accounted for by responses to NEP scale scores in the Greek subsample. However, while the regression model for the Turkish participants was not significant for this item, pro-environmental orientation was still found to positively relate to fossil fuel depletion concerns.

On one level, these findings would appear to point to the importance of individuals' pro-environmental orientations as a predictor of their energy security concerns and, logically, to those facets of energy security more obviously related to concerns about an over-reliance on high-carbon, finite energy sources. However, while not contesting the relevance of environmental worldviews as a predictor of energy security concerns, we argue that care should be taken when drawing conclusions from our study about the strength of this relationship in different populations.

More specifically, it is possible that the retention of NEP scores within the Turkish subsample as a predictor of import dependence, affordability and fossil fuel depletion concerns, compared with the solitary emergence of NEP scores in predicting concerns about fossil fuel depletion within the Greek subsample, is reflective of differences in what the NEP scale is measuring in subsample. While often treated as unidimensional, the NEP scale has been found to have multi-factorial structure that differs between cultures [32,61,62]. For example, research has indicated that the simple, dualistic relationship between endorsement of the NEP and rejection of the Dominant Social Paradigm (or Human Exceptionalism Paradigm) tends to be strongest in Western cultures. In non-Western cultures, the picture can be more complicated, with people simultaneously endorsing the NEP while still endorsing beliefs of human human-exceptionalism [e.g. 61,63].

The singular emergence of NEP scores as a predictor of concern with fossil fuel depletion in the Greek subsample could suggest that within this subsample the NEP scale was tapping relatively narrow desires to limit environmental degradation from human activity. This is consistent with the idea that the Greek subsample was responding to the scale items in relatively dualistic, Westernised way. This contrasts with the Turkish subsample, where the retention of the NEP in all analyses could perhaps be taken to indicate that the scale was registering more general concerns about sustainability, including social and economic sustainability. Indeed, with respect to the Turkish subsample, the retention of NEP scores in the import dependence analysis could be indicative that participants were concerned with the potentially finite nature of the imports rather than the fact they are high-carbon in nature.

Similarly, the concerns with affordability could stem from the belief that as fossil fuels deplete they will become more expensive.

If true, this explanation not only accounts for the differences in the relationships shared between NEP scores and energy security concerns in each of our subsamples, but also questions whether or not the difference seen in mean levels of pro-environmentalism in each subsample were actually real. That is, while it appeared that the Greek participants were significantly 'greener' than the Turkish participants, this could have been a product of the measure used to assess pro-environmentalism in this study as opposed to any genuine underlying differences in their environmental concern. Partial support for this conclusion comes from the fact that there were no significant differences in beliefs about anthropogenic climate change between the samples, which shows which shows the subsamples to be equivalently 'green' on some metrics. Thus, while the findings do identify pro-environmental orientation to be an important predictor of concerns about fossil fuel depletion they also raise questions over the use of the revised NEP scale when drawing cross-cultural comparisons about these relationships. We would advise that researchers should seek to use alternative measures of individuals' pro-environmental orientations in future work in order to test the findings reported in this article.

4.3 Limitations and future directions

There are a number of limitations to the current study. Most notably, we used a relatively small, opportunity sample of participants recruited primarily through contacts of the research team. As such, the subsamples are not fully representative of the Turkish and Greek populations from which they are derived (e.g. there is a preponderance of well-educated males within each subsample, see Table A, Appendix A). This clearly does affect the generalisability of the findings from this research, particularly as some research suggests that the ideal target sample size for research into general perceptions should be around 500 participants [20,64]. Due to budgetary constraints, however, the intention behind this study was not to compare and contrast the opinions of large and nationally representative samples of Greece and Turkey, but rather to provide an initial take on how relationships between

ecological and cultural orientations (assessed by validated measures of pro-environmental and pro-cultural orientations) might interact with a number of dimensions thought to underpin general concerns about energy security within two energy-import dependent countries. While we feel that we have succeeded in our aims, we do also appreciate that there could now be value in conducting the research on more representative samples (e.g. using quota sampling methods) in order to test the replicability and generalisability of the findings.

In terms of understanding the impact of pro-culturalism on concerns with energy security, we used a scale that assessed participants' tendencies to endorse to their cultural history and values that was agnostic of cultural differences. While providing a formal analysis of how the diverse and rich cultural differences between our Turkish and Greek populations (particularly regarding energy-use practices) might have impacted energy security concern was beyond the scope of this study, we do feel that such research is now warranted. For example, Soyez [65], in a cross-national study involving participants from Canada, US, Australia, Germany and Russia, revealed how national cultural values exerted an impact upon more specific pro-environmental values in these countries. As such, it is logical to hypothesise that there might be parallel differences in how national cultural values impact upon concerns about energy security. In fact, it is possible that within our study that some of the differences we observed between our subsamples were a reflection of these underlying national cultural differences. For example, it is possible that differences in the prominent religions in each country (Greek people tending to be Greek Orthodox and Turkish people tending to be predominantly Muslim) exerted an influence, bearing in mind the evidenced links that exist between faith has on environmentally-significant attitudes and behaviours [e.g. 66–68].

A final point relates to the choice of dependent measure used within this study, i.e. Corner et al.'s [11] six item measure of energy security. While this scale had a good internal reliability in both subsamples as a six item measure of energy security concern, we also utilised some of the individual items as dependent measures within our analyses to assess more specific concerns about things like the future affordability of energy, import

dependence, etc. There are clear limitations to drawing strong conclusions from single item measures of complex issues such as the 'affordability' and 'import dependence'. As such, we argue that future research should seek to develop and employ multi-item measures of these (and other, e.g. energy governance) sub-facets of energy security concern in order to more reliably assess the provisional relationships identified in this study.

5. Conclusion

The results of the current study confirm a number of key things about the nature of public opinion towards energy security issues. At one level, the findings confirm the multifaceted nature of energy security attitudes and illustrate that energy security is of genuine public concern. Perhaps more interestingly, though, the results indicate that the extent of this concern (both in general terms and in terms of the individual sub-facets assessed within this study) differs within different populations (in the current case in two populations from different energy import-dependent countries).

A key aim of this study was to investigate how individuals' pro-cultural and pro-environmental orientations might influence their energy security concerns. While pro-culturalism should not be entirely ruled out as a potential shaper of energy security concerns, there was no evidence that a stronger pro-cultural orientation was related to general (or more specific) concerns about energy security in this study. Indeed, while there were lower levels of energy security concern *and* stronger levels of pro-culturalism among the members of the Turkish subsample (consistent with Hypothesis 2), there is no statistically significant evidence of a link between these two factors.

In terms of the links between individuals' pro-environmental orientations and energy security concerns, the findings of this research are perhaps more insightful. The abovementioned issues regarding the revised NEP scale notwithstanding; it is evident from the current study that environmental worldviews are a positive predictor of energy security concerns (Hypothesis 1). This finding is consistent with the links that energy security shares with the destabilization of world climate through energy supply and use practices [1,13]. However, it would appear as though the nature of the relationship is complex; being

sensitive to aspects of the social context, contingent upon the facet of energy security being considered, and arguably related to the choice of measure used to assess pro-environmental orientation.

While the conclusions of this study are tentative given the stated limitations; the research does provide an important contribution to the developing literature pertaining to the nature and antecedents of lay public opinions of energy security and provides a footing for further systematic social scientific investigation into this area.

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Appendix A

Table A.

Key demographic details of the full study sample (N = 175) and for separate Turkish (n = 104) and Greek (n = 71) subsamples.

	Turkey	Greece	Total
Gender			
- Male	67	40	107
- Female	36	31	67
N missing	*1*	*0*	*1*
Survey completion location[a]			
- Home nation	61	56	117
- International location	43	15	58
Age (Years)[b]			
- Mean (St. Dev.)	29.58 (7.37)	27.69 (8.42)	28.64 (7.94)
- Range	16 - 55	19 - 65	16 - 65
N missing	*39*	*6*	*45*
Education Level			
- Non university	15	18	33
- Undergraduate	33	16	49
- Postgraduate	56	36	92
- Prefer not to say	0	1	1
Employment			
- Employed	46	26	72
- Student	48	41	89
- Other (incl. retired)	6	2	8
- Prefer not to say	4	1	5

Political Affiliation			
- Left	45	12	57
- Centre	16	16	32
- Right	8	8	16
- Other	9	9	18
- Prefer not to say	26	26	52
Belief in Climate Change			
- Yes	99	71	170
- No	4	0	4
- Don't know	1	0	1
Cause of Climate Change			
- Fully/Mainly Anthropogenic causes	42	34	76
- Equally Natural and Anthropogenic causes	49	28	77
- Fully/Mainly Natural causes	8	8	16
- Other (incl. don't believe)	4	1	5
N missing	*1*	*0*	*1*

[a] Greek and Turkish respondents completing the survey from Cyprus were counted as completing the survey from their home nation.

[b] Mean age is an approximate calculation. In the survey, participants were asked to provide the year of their birth. The response provided was subtracted from the year within which the survey was completed (i.e. 2012)

Appendix B

The following question wording was used in the online survey. The survey questions were translated into Turkish and Greek by native speakers of each language.

1. Energy security

a. How concerned, if at all, are you that in the future that: (1) Electricity will become unaffordable; (2) Electricity will be rationed; (3) Your country will become too dependent on energy from other countries; (4) Terrorist attacks will cause interruptions to electricity supplies; (5) Supplies of fossil fuels (e.g. coal and gas) will run out; and (6) There will be power cuts? [*Not at all concerned; Not very concerned; Fairly concerned; Very concerned; Don't know; No opinion*].

b. Where do you think that [Turkey/Greece] currently imports energy from (please state)? [*Free response*].

2. Climate Change beliefs and pro-environmental orientation (labelled as 'Environmental Opinions')

a. Before today, had you head of climate change? [Yes, No, Don't know]

b. To what extent do you believe that climate change is the result of human activity of natural processes? [*Fully the result of human activity; Mainly the result of human activity; Partly the result of human activity and partly the result of natural processes; Mainly the result of natural processes; Fully the result of natural processes; I don't believe in climate change; Don't know; No opinion*].

c. (1) How concerned, if at all, are you about climate change? (2) Considering any potential effects of climate change on you personally; how concerned, if at all, are you about climate change? (3) Considering any potential effects of climate change on society in general; how concerned, if at all, are you about climate change? [*Not at all concerned; Not very concerned; Fairly concerned; Very concerned; Don't know; No opinion*].

d. 15-item revised New Ecological Paradigm (NEP) Scale [31]: (1) We are approaching the limit of the number of people that the earth can support; (2) Humans have the right to modify the natural environment to suit their needs*; (3) When humans interfere

with nature it often produces disastrous consequences; (4) Human ingenuity will ensure that we do not make the earth unliveable*; (5) Humans are severely abusing the environment; (6) The earth has plenty of natural resources if we just learn how to develop them*; (7) Plants and animals have as much right as humans to exist; (8) The balance of nature is strong enough to cope with the impacts of modern industrial nations*; (9) Despite our special abilities humans are still subject to the laws of nature; (10) The so called "ecological crisis" facing humankind has been greatly exaggerated*; (11) The earth is like a spaceship with very limited room and resources; (12) Humans were meant to rule over the rest of nature*; (13) The balance of nature is delicate and easily upset; (14) Humans will eventually learn enough about how nature works to be able to control it*; and (15) If things continue on their present course, we will soon experience a major ecological catastrophe. [*Strongly agree; mildly agree; unsure; mildly disagree; strongly disagree* - *reverse coded for analysis so that endorsement of all items equates to stronger pro-environmental orientation].

4. Pro-cultural orientation (labelled as 'Cultural Beliefs & Values')

a. 19-item Cultural Worldview (CW) Scale [46]: (1) The cultural values of our forefathers are important to me; (2) Culture does not help me to identify myself*; (3) I want to know the foods our grandmothers made; (4) We are not losing our cultural heritage*; (5) We need to conserve more cultural heritage for future generations; (6) Cultural heritage does not mean anything to my wellbeing*; (7) I would like to know our traditional style of dress; (8) Students do not need to learn what their culture is*; (9) The present cultural heritage should be available for my children's children; (10) Cultural heritage is not disappearing*; (11) The foods our grandmothers made are important to be; (12) We do not need to care about cultural heritage*; (13) Cultural heritage must be a part of our life; (14) Although we do our business as usual, there won't be any major cultural loss*; (15) Our traditional style of dress is important to me; (16) Buildings, museums and paintings do not have the right to be preserved*; (17) Future generations have the right to enjoy the present cultural heritage; (18) Ideas, beliefs and customs do not have the right to be preserved*; and (19) Culture helps us to live with people of different backgrounds. [*Strongly agree; Mildly agree; Unsure; Mildly*

*disagree; Strongly disagree - *reverse coded during analysis so that endorsement of all items equates to stronger pro-cultural orientation*].

5. Nationalism

a. 17-item Nationalism Scale [69]**. *Scale not included in the analysis due to errors in data collection.*** Example items include: (1) It is nonsense that all nations are equal. Some peoples are more, some less honourable; (2) To be without a nation is like to be without a family; (3) It is not good to be too open towards other nations. [*Agree very strongly; Agree strongly; Agree; Disagree; Disagree strongly; Disagree very strongly*].

b. What nationality would you say you are (please state)? [*Free response*]

6. Demographics (labelled as 'A Bit About You')

a. Gender: What is your gender? [*Male; Female; Other; Prefer not to say*].

b. Age: In what year were you born? [*Free response*].

c. Education level: What is the highest degree or level of school you have completed? [*No schooling; Primary school; High school; Bachelors degree; Postgraduate degree; Prefer not to say*].

d. Employment status: Are you currently…? [*Employed; Unemployed; A homemaker; A student; Retired; Unable to work; Prefer not to say*].

e. Evaluation of personal and country economic situation: (1) In the next 12 months your economic situation will improve; (2) In the next 12 months your country's economic situation will improve; (3) The distribution of income in your country is fair? [*Strongly agree; Mildly agree; Unsure; Mildly disagree; Strongly disagree*].

f. Religion: What is your religion? [*Islam; Christianity; Judaism; No religion; Prefer not to say; Other (please state)*].

g. Political opinion: (1) What are your political views? [*Left; Right; Centre; Prefer not to say; Other (please state)*]; (2) Please state which political party you support. [*Free response*].

[ii] The nature of the relationship between pro-environmental orientation and energy security concern is something that requires further investigation. For example, one might assume that in situations where the status quo is reversed (i.e. where there is a perceived overreliance on domestic, renewable options); that those with weaker pro-environmental orientations might show higher concerns for energy security (e.g. due to concerns about intermittency [70]).

[iii] For an outline (and delineation) of the 'cultures' that are of relevance within the context of research into energy security, see Sovacool [20].

[iv] A further section aiming to assess participants' nationalism—using Todosijević's [69] 17-item nationalism scale—was included in the survey but errors in the data collection for this scale meant that it could not be used in the analysis.

[v] In a slight difference to Corner et al. [11] we phrased all questions such that they related to 'energy' rather than the original mix of 'energy' and 'electricity' themed questions.