

DOES GENDER REALLY MATTER WHEN WE ARE TALKING ABOUT ENERGY SAVING ATTITUDES AND BEHAVIOURS?

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ABSTRACT

Some studies indicate that women tend to be more pro-environmental than men, since they buy more green products, play a more active role in the separation of packages for recycling and display a behaviour that is more favourable in regard to saving energy resources. With a specific focus on gender differences, this study aims to compare English and Portuguese students' attitudes and behaviours regarding energy saving. Three universities participated in this study, one from Portugal (PT) and two from the United Kingdom (UK), with data collected through a questionnaire. The results point to a number of significant differences regarding gender between the respondents from the two countries, and some consistent trends in gender differences across the whole sample and the sub-samples from the different countries. The key trends identified overall are that female students are significantly more likely to express positive attitudes towards energy saving, and to undertake energy-saving behaviours. Differences between the sub-samples are relatively small compared to the similarities between them, suggesting that gender differences are reasonably consistent across the two countries.

KEY WORDS

Gender; Energy saving; Higher education; Europe; Environmental attitudes.

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1. Introduction

Over recent decades, energy conservation has increasingly been seen as an effective strategy for extending energy and material resources; conservation efforts, involving both technological innovation and more careful consumption habits, have resulted in significant savings and reduction in energy usage. Awareness of natural resources and environmental conservation have become increasingly important agenda items in the context of globalisation, where the impacts of natural disasters and severe environmental problems have become a global concern (Dansirichaisawat and Suwunnamek, 2014). Conservation is starting to be recognised, by organisations and the general public, as a valuable and positive principle Neuman (1986) worthy of pursuit. Regarding public entities, in some EU countries government policies promote energy reduction and alternative energy usage.

The individual is at the centre of many environmental problems and is frequently asked to contribute to the preservation of the planet by having more environmentally friendly attitudes and behaviours. Thus, due to the importance of individual actions, many models have been developed and a variety of studies have been conducted to explain the determinants of such behaviour. Some of these are supported by the theories of reasoned action or theories of norm-activation. Some scholars have established the positive relationship between environmental concern, attitude and behaviour, while others have researched reasons for the gap between environmental concern and behaviour (Scott and Vigar-Ellis, 2014).

However there is a lack of studies specifically regarding energy saving attitudes and behaviours and the moderate role of some variables such as values, personality, occupation, gender, etc. In the case of sustainable consumption it is possible to find some studies that have attempted to use an integrated approach, for example, Pinto et al. (2014). Their results indicated that when personal identity was relevant, female participants manifested higher levels of sustainable consumption compared with males. Nevertheless, when social identity was prominent, male participants increased their sustainable consumption intentions to the same level as female participants. It is noted that gender appears to be an important variable that influence how people think and behave. Because of biological differences and social experience, men and women in general tend to demonstrate different values, attitudes and behaviours. For instance, women attribute more importance to self-transcendence values, being more concerned about social justice, harmony with nature and environmental protection (Fukukawa et al., 2007; Schwartz and Rubel, 2005). In contrast, men ascribe more importance to self-enhancement values, being more worried about success, capability and ambition (Schwartz and Rubel, 2005). All these differences will have implications in the way both see the environment and act regarding its preservation.

This research aims to compare English and Portuguese students' attitudes and behaviours regarding energy saving. The comparison will pay special attention mainly to the differences between male and female students. Three universities participated in this study, one from Portugal (PT) and two from the United Kingdom (UK).

2. Literature review

As individuals are responsible for a large percentage of energy consumption, they have been encouraged to take part in activities directed at saving energy resources. Institutions, too, particularly when they see their energy bills increasing, are also beginning to adopt environmentally friendly practices with regard to the saving and rational use of energy (Paço and Varejão 2010).

Pickett, Kangun and Grove (1995) undertook a study regarding the nature and frequency of conservation activities (including energy-saving behaviour) and the implications for public policy. According to these authors, conservation activities can comprise a broad range of aspects: dispositional activity, recycling of non-durable goods and their packaging, preservation of resources, etc. The results indicated that the individuals less involved in such activities seem to be less affected by pollution problems and less concerned with social problems.

Another study considering a sample of students from four countries (Germany, UK, Spain and Portugal) found that the English sample had the highest means for almost all conservation activities, apart from saving water whilst washing dishes. In general mean values were high for the questions on waste separation/recycling, energy conservation and water saving. However, Portuguese students presented the lowest mean for almost all items, being the group that recycles least, saves fewest resources and cares least about packaging. This indicates that there may be some differences between the conservation activities undertaken in these two countries – and this may also be reflected in energy saving behaviours (Paço et al., 2013). Previous research by Paço and Varejão (2010), using a Portuguese sample, indicated that the factors that most influence behaviour with regard to the saving of energy resources were the “cost of the electricity bill” and “environmental concern”. However, “advertising campaigns” were also seen to have some importance in terms of the influence on individual behaviour.

At this point it would be useful to make some consideration of the relationships between environmental attitudes and behaviours, and more specifically between attitudes and behaviours regarding energy conservation and saving.

As Hines, Hungerford and Tomera (1987) stated, the relationship between environmental attitudes and behaviours is complex and has caused some debate across the academy. Consumers do not always translate their environmental concerns into effective purchasing behaviour, although the evidence on this is mixed. Cleveland, Kalamas and Laroche (2005) state that general environmental attitudes tend to be poor predictors of behaviour; in contrast, Balderjahn (1988) concluded that individuals who had a positive attitude towards the environment were more likely to purchase and consume green products. In the studies by Yam-Tang and Chan (1998), the levels of concern displayed by individuals are not reflected in their environmental purchasing habits, or even in other environmental behaviours. The same may also happen in relation to energy saving. Sometimes, the economic factors and the need to lower costs outweigh the importance of environmental concern (Paço, Raposo and Leal Filho 2009).

Other variables such as demographics should also be taken into account when analysing energy saving behaviours. In this research attention is focused specifically on gender. According to O’Shaughnessy and Kennedy (2010) gender is a variable that may explain differences in environmental beliefs, values, attitudes, and behaviours,

however empirical findings are contradictory: although women are more likely to demonstrate high concern for environmental issues, they are less likely to engage in environmental practices. Tindall, Davies and Mauboulés (2003) also suggest that women demonstrate a higher degree of environmental concern in their conservation behaviour without engaging in correspondently higher levels of activism.

Mainieri and Barnett (1997) concluded that women tend to be more pro-environmental than men, since they buy more green products and play a more active role in the separation of packages for recycling. Nonetheless, no significant differences were found between the sexes in terms of their participation in activities for the conservation of natural resources, or in environmental groups. The research of Paço and Varejão (2010) concluded that women display behaviour that is more favourable in regard to saving energy resources than do men.

In a study of students, Zelezny Chua and Aldrich (2000) suggest that females generally have more positive environmental attitudes; their pro-environmental behaviour is reported to be even stronger than their attitudes. In turn, O'Shaughnessy and Kennedy (2010) attribute more environmental concern to females, but lower levels of engagement in environmental practices, as in the case of the participation in environmental movements (Mohai 1992). Tindall, Davies and Mauboulés (2003) agree that women demonstrate a higher degree of environmental concern in their conservation behaviour without engaging in a correspondently, higher levels of activism. Their results show no substantial gender differences in levels of activism, but reveal that women engage in significantly higher rates of environmentally friendly behaviour.

Looking specifically at research focusing on energy saving, Cotton et al. (in press a) in the UK found differences in knowledge about energy issues by gender, as well as differences in the extent of their concern about energy issues. Male students were more confident about their knowledge of energy (echoing wider research on gender differences in self-confidence by Syzmanowicz and Furnham 2011), but were also more likely to give correct answers to some factual questions about energy. Differences were also found between the genders in terms of the kinds of environmental issues which students were concerned about: male students were significantly more likely to cite 'maintaining secure energy sources' as their most important concern than females; conversely, females were more likely to refer to 'preventing wars and nuclear threats' as their most significant concern (Cotton et al., in press b). This may explain some of the mixed results on gender and environmental concern, since the outcomes of a comparison of gender differences in environmental attitudes and behaviours may be dependent upon the precise issue which is under consideration.

On the basis of previous research findings, the following hypotheses were formulated:

H₁: There are significant differences between male and female students regarding their attitudes towards energy conservation.

H_{1,1}: There are significant differences between male and female Portuguese students regarding their attitudes towards energy conservation.

H_{1,2}: There are significant differences between male and female English students regarding their attitudes towards energy conservation.

H₂: There are significant differences between male and female students regarding their energy saving behaviours.

H_{2.1}: There are significant differences between male and female Portuguese students regarding their energy saving behaviours.

H_{2.2}: There are significant differences between male and female English students regarding their energy saving behaviours.

3. Methodology

Data were collected through a survey of English and Portuguese students. This took the form of a self-administered questionnaire which was made available online in one Portuguese and two English public universities. From Portugal the responses were collected in the University of Beira Interior (UBI) which has been promoting both sustainable construction and building conservation; however this institution has no formal policy or strategy in place for sustainable development. It has made some effort related to energy, water saving and recycling but not as part of an overarching strategic approach. In relation to the curriculum, there is no drive to incorporate sustainable development into formal education. In contrast, Plymouth University (PU) and Bournemouth University (BU) have been focusing strongly on sustainability. PU is currently placed first in the UK People and Planet Green League¹. It received funding from the Higher Education Funding Council for England (HEFCE) in 2005 under the CETL (Centres for Excellence in Teaching and Learning) scheme² to set up the Centre for Sustainable Futures, and has won several 'Green Gown Awards'³. Thus, it provides a context in which curriculum and campus greening issues have been taken seriously. BU has also consistently appeared in the top ten of the People and Planet Green League table; its initiatives have been rewarded by external recognition both locally and nationally, and staff are encouraged to address education for sustainability across the curriculum.

The original survey (within the UK) was designed and implemented to address a wider research project⁴ (which both the UK universities participated in) however a sub-set of questions was used to gather comparable data from the Portuguese institution. In this study a particular set of questions has been used to enable comparison. The part of the questionnaire used for this specific study was designed to enable information to be gathered about students' attitudes (five-point scales (min 1, max 5), where 3 is the indifference value: 1- Strongly disagree, 2- Disagree, 3- Neither agree or disagree, 4- Agree, Strongly agree) and behaviours (four-point scales - min 1, max 4: 1- Never, 2- Infrequently, 3- Frequently, 4- Always), regarding energy saving. Some questions were also posed to gather demographic information (age, gender and nationality). After collection, the data were analysed and interpreted using the statistical software SPSS 21.0 (Statistical Package for Social Sciences). A descriptive analysis was undertaken, together with t tests for a level of significance of 0,05.

¹ <http://peopleandplanet.org/greenleague>

² <http://www.hefce.ac.uk/whatwedo/lt/enh/cetl/>

³ http://www.eauc.org.uk/green_gown_awards

⁴ See Cotton et al. (a in press) for further information about survey development.

4. Results

4.1. Sample characterisation

The sample is composed of 800 (34,9%) students from the University of Beira Interior (UBI) (Portugal - PT), 679 (29,6%) students from Plymouth University (PU) and 815 (35,5%) students from Bournemouth University (BU) (35,5%). These last two institutions are located in United Kingdom (UK) and make up 65,1% of the sample. Gender and age distribution is represented in table 1.

Table 1. Gender and age distribution by institution

University	Gender		Age	
UBI	Male	310 (38,8%)	20 or under	367 (45,9%)
	Female	490 (61,3%)	21-25	331 (41,4%)
	<i>Total</i>	<i>800 (100%)</i>	26-35	84 (10,5%)
			36-45	17 (2,1%)
			46-55	–
			Over 55	1 (0,1%)
		<i>Total</i>	<i>800 (100%)</i>	
PU	Male	198 (29,2%)	20 or under	338 (49,8%)
	Female	473 (69,7%)	21-25	331 (48,7 %)
	Missing	8 (1,2%)	26-35	–
	<i>Total</i>	<i>679 (100%)</i>	36-45	–
			46-55	–
			Over 55	–
		Missing	10 (1,5%)	
		<i>Total</i>	<i>679 (100%)</i>	
BU	Male	240 (29,4%)	20 or under	209 (25,6%)
	Female	559 (68,6%)	21-25	361 (44,3%)
	Missing	16 (2,0%)	26-35	147 (18,0%)
	<i>Total</i>	<i>815 (100%)</i>	36-45	54 (6,6%)
			46-55	30 (3,7%)
			Over 55	4 (0,5)
		Missing	10 (1,2%)	
		<i>Total</i>	<i>815 (100%)</i>	

In all three samples the number of female participants in the study is higher than the number of males. This was least evident in the Portuguese university, where the percentage of male respondents was highest of the 3 institutions. The two first age groups (20 or under and 21-25) are the largest in all universities. UBI presents the youngest population and BU the oldest.

4.2. Student's attitudes regarding energy

In order to see if there were differences between male and female students regarding their attitudes towards energy conservation (H_1) a t-test was performed for the equality of means; the results can be seen in table 2. In this case the whole sample (students from Portugal and from United Kingdom) is compared.

Table 2. Attitudes: descriptives and t-test for equality of means (PT and UK)

	Gender	N	Mean	Std. Deviation	p
I would do more to save energy if I knew how	Male	748	4,03	0,890	0,000
	Female	1520	4,19	0,788	
The way I personally use energy does not make a difference to the national energy situation	Male	745	2,49	1,091	0,000
	Female	1521	2,23	0,968	
I can influence what the government does about energy problems	Male	745	2,71	1,088	0,597
	Female	1519	2,73	0,978	
I can influence what companies do about energy problems	Male	747	2,68	1,081	0,713
	Female	1517	2,70	0,984	
I trust the government to do something about any energy problems	Male	748	2,68	1,115	0,000
	Female	1513	2,51	1,017	
Scientists will find ways to solve energy problems	Male	744	3,76	0,885	0,000
	Female	1516	3,55	0,819	
More wind farms should be developed to generate electricity, even if they are located in scenic environments	Male	748	3,61	1,146	0,824
	Female	1520	3,62	1,066	
The government should have stronger standards on fuel efficiency of cars	Male	748	3,95	1,005	0,015
	Female	1519	4,04	0,783	
Climate change has been established as a serious problem and immediate action is necessary	Male	748	4,19	0,914	0,545
	Female	1518	4,21	0,849	
Climate change is caused by human activities related to using energy	Male	747	3,95	0,950	0,444
	Female	1519	3,98	0,861	
There are benefits to people in the country from climate change	Male	745	2,60	1,134	0,013
	Female	1519	2,48	1,011	

It is clear from table 2 that there are significant differences between males and females in the following cases: “I would do more to save energy if I knew how”; “The way I personally use energy does not make a difference to the national energy situation”; “I trust the government to do something about any energy problems”; “Scientists will find ways to solve energy problems”; “The government should have stronger standards on fuel efficiency of cars” and “There are benefits to people in the country from climate change”, by which hypothesis 1 is partially confirmed. In most of these examples, the female responses suggest a more pro-environmental leaning, particularly when it comes to personal behaviour change. Females claim they would be more likely to undertake energy-saving behaviours if they know how, and are more likely to believe that their own use of energy makes a difference to the national energy situation – thus they may be more motivated to change their behaviour. On the other hand, male respondents are more likely to believe that scientists will solve energy problems or the government will legislate to prevent them – and thus are less likely to be motivated to change their own behaviour. They are also significantly more likely to believe that climate change will bring benefits to the country, which again would act as a limit on any behaviour change in mitigation. That females are more likely to support stronger legislation on fuel efficiency in cars may also indicate a more positive environmental outlook, although this may also reflect gender differences in enthusiasm for cars in general. These mixed results are in line with Cotton et al. (in press b) and again we observe that the outcomes of a comparison of gender differences in environmental attitudes may be dependent upon the aspect which is under consideration.

Regarding the existence of differences between Portuguese male and female students concerning their attitudes towards energy conservation ($H_{1.1}$) another t test was undertaken (table 3).

Table 3. Attitudes: descriptives and t-test for equality of means (PT)

	Gender	N	Mean	Std. Deviation	p
I would do more to save energy if I knew how	Male	310	3,98	0,988	0,037
	Female	490	4,12	0,926	
The way I personally use energy does not make a difference to the national energy situation	Male	310	2,63	1,068	0,000
	Female	490	2,33	1,071	
I can influence what the government does about energy problems	Male	310	2,84	1,071	0,626
	Female	490	2,87	0,977	
I can influence what companies do about energy problems	Male	310	2,88	0,964	0,858
	Female	490	2,89	0,951	
I trust the government to do something about any energy problems	Male	310	2,79	1,062	0,032
	Female	490	2,63	1,035	
Scientists will find ways to solve energy problems	Male	310	3,74	0,909	0,124
	Female	490	3,65	0,809	
More wind farms should be developed to generate electricity, even if they are located in scenic environments	Male	310	3,49	1,096	0,600
	Female	490	3,53	1,085	
The government should have stronger standards on fuel efficiency of cars	Male	310	3,95	0,987	0,006
	Female	490	4,12	0,754	
Climate change has been established as a serious problem and immediate action is necessary	Male	310	4,31	0,816	0,011
	Female	490	4,44	0,708	
Climate change is caused by human activities related to using energy	Male	310	3,92	0,834	0,013
	Female	490	4,07	0,796	
There are benefits to people in the country from climate change	Male	310	2,56	1,175	0,039
	Female	490	2,39	1,084	

In the Portuguese sample there were no differences between females and males in the item “Scientists will find ways to solve energy problems”, when compared with the general sample, but what is noticeable is that there are significant differences in the variables “Climate change is caused by human activities related to using energy” and “There are benefits to people in the country from climate change”, confirming partially $H_{1.1}$. Females are more likely to acknowledge that climate change is caused by humans and less likely to think that there are benefits from climate change – which again may lead them to be more motivated to try and do something about climate change.

Finally, to explore any differences between English male and female students concerning their attitudes towards energy conservation ($H_{1.2}$) another t test was undertaken (table 4).

Table 4. Attitudes: descriptives and t-test for equality of means (UK)

	Gender	N	Mean	Std. Deviation	p
I would do more to save energy if I knew how	Male	438	4,06	0,812	0,000
	Female	1030	4,21	0,712	
The way I personally use energy does not make a difference to the national energy situation	Male	435	2,40	1,099	0,000
	Female	1031	2,18	0,910	
I can influence what the government does about energy problems	Male	435	2,61	1,092	0,396
	Female	1029	2,66	0,971	
I can influence what companies do about energy problems	Male	437	2,54	1,138	0,274
	Female	1027	2,60	0,986	
I trust the government to do something about any energy problems	Male	438	2,60	1,145	0,016
	Female	1023	2,46	1,004	
Scientists will find ways to solve energy problems	Male	434	3,77	0,868	0,000
	Female	1026	3,50	0,821	
More wind farms should be developed to generate electricity, even if they are located in scenic environments	Male	438	3,69	1,173	0,616
	Female	1030	3,66	1,054	
The government should have stronger standards on fuel efficiency of cars	Male	438	3,94	1,019	0,249
	Female	1029	4,00	0,794	
Climate change has been established as a serious problem and immediate action is necessary	Male	438	4,11	0,969	0,931
	Female	1028	4,11	0,888	
Climate change is caused by human activities related to using energy	Male	437	3,97	1,024	0,558
	Female	1029	3,94	0,888	
There are benefits to people in the country from climate change	Male	435	2,63	1,104	0,078
	Female	1029	2,53	0,972	

In this case it was possible to find significant differences in just in four variables (the same that were already significant for the general sample) by which it is not possible to confirm the hypothesis. However, the significant differences in this sample are generally in the same direction as the others; e.g. male students are less likely than females to do more to save energy if they knew how, and are less likely to feel that their own behaviour has an impact on the national energy situation. They are also again more trusting of scientists and government to solve problems, suggesting that there are some gender differences which are visible in both countries, despite the different national and institutional contexts of these students.

4.3. Students' behaviours regarding energy

In order to test whether there were differences between male and female students regarding their energy saving behaviours (H_2) a t-test for the equality of means was performed; the results can be seen in table 5. In this case the total sample (students from Portugal and from United Kingdom) is compared.

Table 5. Behaviours: descriptives and t-test for equality of means (PT and UK)

	Gender	N	Mean	Std. Deviation	p
Turn off lights when they are not in use	Male	748	3,53	0,563	0,000
	Female	1522	3,62	0,543	
Turn down the heat	Male	747	3,13	0,765	0,064
	Female	1519	3,07	0,763	
Try to save water	Male	746	3,05	0,740	0,001
	Female	1517	3,15	0,725	
Walk or cycle short distances instead of going by car	Male	747	3,15	0,883	0,282
	Female	1520	3,11	0,852	
Buy things that are likely to involve less energy or resource use	Male	748	2,44	0,815	0,054
	Female	1517	2,51	0,805	
Pay a bit more for environmentally friendly products	Male	748	2,32	0,820	0,002
	Female	1520	2,43	0,807	
Avoid charging mobile phones overnight	Male	744	2,01	1,005	0,399
	Female	1517	2,05	0,980	
Turn off the stand-by button of the TV set or switch appliances off at the plug	Male	747	2,72	1,023	0,001
	Female	1518	2,86	1,000	
Use rechargeable batteries	Male	745	2,46	0,975	0,104
	Female	1516	2,53	0,956	

The analysis demonstrates a mixture of results: “Turn off lights when they are not in use”, “Try to save water”, “Pay a bit more for environmentally friendly products” and “Turn off the stand-by button of the TV set or switch appliances off at the plug” were the variables that illustrated more discrepancy between the sexes, which confirms just partially the second hypothesis. In all these cases females presented with a higher score than males. These results seem to support the theory discussed above that females will be more motivated to change their behaviour owing to their attitudes towards energy issues. Looking at all of the results above (not just those which are significant), the pattern is generally that of females being more likely to report undertaking energy-saving behaviours. The only exceptions to this rule are around turning down heat, and walking or cycling rather than taking the car (and the latter is a very small and non-significant difference). Note that in a previous study of Paço and Varejão (2010), women demonstrated to be more careful with energy and other resources saving for almost all items.

In regard to the existence of differences between Portuguese male and female students regarding their energy saving behaviours ($H_{2,1}$) another t test was undertaken (table 6).

Table 6. Behaviours: descriptives and t-test for equality of means (PT)

	Gender	N	Mean	Std. Deviation	p
Turn off lights when they are not in use	Male	310	3,45	0,553	0,006
	Female	490	3,56	0,570	
Turn down the heat	Male	310	3,09	0,760	0,010
	Female	490	2,95	0,755	
Try to save water	Male	310	3,06	0,668	0,006
	Female	490	3,19	0,662	
Walk or cycle short distances instead of going by car	Male	310	2,95	0,958	0,881
	Female	490	2,94	0,886	
Buy things that are likely to involve less energy or resource use	Male	310	2,38	0,762	0,380
	Female	490	2,43	0,768	
Pay a bit more for environmentally friendly products	Male	310	2,29	0,766	0,358
	Female	490	2,34	0,728	
Avoid charging mobile phones overnight	Male	310	2,12	0,924	0,051
	Female	490	2,25	0,917	
Turn off the stand-by button of the TV set or switch appliances off at the plug	Male	310	2,53	0,964	0,272
	Female	490	2,61	0,945	
Use rechargeable batteries	Male	310	2,26	0,925	0,003
	Female	490	2,47	0,933	

As in the previous case there were significant differences in just four variables (“Turn off lights when they are not in use”, “Turn down the heat”, “Try to save water” and “Use rechargeable batteries”). Although the significance differs from the whole sample, the pattern of responses is the same, with the only items in which males report a higher level of the behaviour being turning down the heat, and walking or cycling rather than taking the car.

Looking finally for any differences between English male and female students regarding their energy saving behaviours ($H_{2,2}$) the values are shown in table 7.

Table 7. Behaviours: descriptives and t-test for equality of means (UK)

	Gender	N	Mean	Std. Deviation	p
Turn off lights when they are not in use	Male	438	3,59	,562	0,033
	Female	1032	3,65	,527	
Turn down the heat	Male	437	3,16	,768	0,434
	Female	1029	3,12	,761	
Try to save water	Male	436	3,03	,789	0,021
	Female	1027	3,14	,753	
Walk or cycle short distances instead of going by car	Male	437	3,30	,797	0,027
	Female	1030	3,19	,825	
Buy things that are likely to involve less energy or resource use	Male	438	2,48	,849	0,158
	Female	1027	2,55	,820	
Pay a bit more for environmentally friendly products	Male	438	2,35	,855	0,006
	Female	1030	2,48	,838	
Avoid charging mobile phones overnight	Male	434	1,94	1,055	0,773
	Female	1027	1,96	,995	
Turn off the stand-by button of the TV set or switch appliances off at the plug	Male	437	2,86	1,043	0,023
	Female	1028	2,99	1,003	
Use rechargeable batteries	Male	435	2,60	,987	0,492
	Female	1026	2,56	,965	

Analysing the previous table significant differences between male and female English students in five behavioural variables were found: “Turn off lights when they are not in use”, “Try to save water”, “Walk or cycle short distances instead of going by car”, “Pay a bit more for environmentally friendly products” and “Turn off the stand-by button of the TV set or switch appliances off at the plug”, confirming partially the last hypothesis. Again, very similar patterns are found, with females presenting with higher scores than males in all significant items except for “Walk or cycle short distances instead of going by car”. The only exception to the pattern noted earlier is that this sub-sample shows a very slightly higher (non-significant) chance of male students using rechargeable batteries.

5. Conclusions

This study set out to compare English and Portuguese students’ by exploring their attitudes and behaviours regarding energy saving. It identified a number of significant differences regarding gender between the respondents from the two countries, and some consistent trends in gender differences across the whole sample and the sub-samples from the different countries. The key trends identified overall are that female students are significantly more likely both to express positive attitudes towards energy saving, and to undertake energy-saving behaviours (although there are differences observed depending upon the precise attitudinal statement and behavioural activity), as found in Zelezny Chua and Aldrich (2000) or in Tindall, Davies and Mauboulés (2003). Differences between the sub-samples are relatively small compared to the similarities between them, suggesting that gender differences are

reasonably consistent across the two countries, which is somewhat different from the findings of Paço et al. (2013) where an English sample of students were found to have the highest means for almost all conservation activities and the Portuguese sample presented the lowest mean for almost all items, being the group that recycles least, saves fewest resources and cares least about packaging.

Nevertheless, there are some interesting gender differences in beliefs about personal agency, responsibility and trust in others to mitigate energy issues that would warrant further exploration. Additionally, lifestyles and habits, and sense of personal responsibility are also worth exploring. This would enhance the comparison of results across future studies. In future it also would seem desirable to analyse and compare other variables (e.g. environmental literacy, infrastructures to support environment practices, courses, etc.) and to extend the study to embrace a larger number of universities across Europe.

For public policy makers, educational programmes may be necessary to promote knowledge levels and alter consumer preferences and behaviours regarding energy. In formulating these programmes, it should be taken into consideration that increasing levels of consumers' confidence in their capacity to contribute to mitigating environmental problems is very important. Despite the obvious economic benefits that conserving energy brings there should also be a focus on the preservation of the environment and resources for subsequent generations.

There are obviously limits to the claims that can be made on the basis of this sample because research is limited by the number of institutions that participated. These institutions may be not representative of the reality in these two countries; however as an exploratory piece of research the results suggest that this is an area that needs further investigation.

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