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## **Environmental Education and Pro-environmental Consumer Behaviour – results of a university survey**

### **Introduction**

Moving towards environmentally conscious behaviour and sustainable consumption is one of the main challenges for mankind in the following decades. Environmental education and its role in changing the lifestyle and attitudes of students is therefore crucial in altering future consumer behaviour. To explore consumption patterns of students, a questionnaire-based survey was carried out at Corvinus University of Budapest in Autumn 2008 and February 2009, with the participation of 436 respondents.

In accordance with our assumption that environmental education and specializing in environmental issues is closely related to more environmentally conscious behaviour, our sample consisted of various student groups: graduate and undergraduate students, students specializing in environmental issues and students of other specializations. We also formed two control groups from graduate management students specializing in finance, and first year „novice” students who were at the very beginning of their university studies and thus had not completed any environmental course.

The first part of the questionnaire used in the survey was related to environmental education, the second to environmental consciousness, while the third part enquired about consumption and its relation to the environment. The questionnaire concluded with a few questions on demographic and socio-economic characteristics.

The results were interpreted via descriptive statistics as well as factor and cluster analysis.

As pro-environmental behaviour is shaped by several factors, the paper starts with a literature review, presenting a summary on theories and research findings regarding individual environmental awareness.

## **Approaches to individual environmental awareness**

Each and every model to be described below wishes to explain the awareness-shaping stages that the individual goes through and the influencing factors that lead or do not lead to environmentally conscious behaviour. The models generally do not define the concept of pro-environmental behaviour but Courtenay-Hall and Rogers (2002) as well as Gough (2002) underline that this concept is far from being unambiguous and can only be defined in relative terms, which also reflect value judgements.

According to the earliest models of environmental awareness dating back to the early 1970s (e.g. Disposito 1977, Loundsbury és Tournatsky 1977), ecological knowledge (the totality of ecological knowledge and information) leads directly to environmentally related attitudes (concerns, the process of becoming aware of problems, recognising the need to protect the environment, etc.) and finally to pro-environmental behaviour (see in detail Chan 1998).

However, findings of empirical research soon showed that individual behaviour cannot be directly predicted and explained by the individual's environmental attitudes formulated in the light of ecological knowledge. Therefore, researchers started attempting to explore the reasons for gaps between attitudes and actual behaviour. Ajzen and Fishbein (1980) established the "theory of reasoned action", which does not explicitly refer to environmental awareness but deals with reasoned action in general. According to the authors, attitudes do not directly determine behaviour but they influence the intention to act which shapes actual behaviour. Attitudes depend on "evaluative beliefs" (how the individual evaluates the consequences of certain behaviour based on his/her own values and beliefs) and "normative beliefs" (how the individual perceives the ideas of other members of the community related to given behaviour and to what extent he/she is motivated to meet these expectations). Normative beliefs and the motivation to comply with those view influence not only attitudes but also "subjective norms" of the individual. All in all, attitudes, subjective norms as well as the relative importance attached to them, together influence the intention to act. The model is limited in the sense that it always presumes action taken by the indi-

vidual to be rational. In spite of this shortcoming, it has proved useful in further research due to its transparency and simplicity.

Later Ajzen (1991) developed the TORA and elaborated the “theory of planned behaviour” (TPB). In the TPB he introduces new components: the “control beliefs” and the so-called “perceived behavioural control”. Perceived behavioural control is shaped by the control beliefs and characterises how the individual considers the impact of his/her behaviour on the given issue. Persons with strong internal control are convinced that their behaviour can ensure changes, whereas persons with strong external control are convinced of the opposite.

Based on Ajzen’s established theory, Hines, Hungerford and Tomera elaborated the “model of responsible environmental behaviour” (Hines et al. 1986), which summarises their findings of 128 studies focusing on factors which influence environmentally conscious behaviour. The model is more refined than the theory of Ajzen inasmuch as it incorporates factors which influence personality considerations, attaches importance to the knowledge of ecological problems, considers the knowledge of possible action strategies and the person’s action skills as preconditions for the intention to act, and takes into account *situational factors* (economic constraints, social pressure, opportunity to select between various actions, established traditions, the sacrifice required by the behaviour, availability of infrastructure) which definitely influence behaviour in specific situations.

Kollmuss and Agyeman (2002) have developed their own theory by systematically analysing the most important models of environmentally aware behaviour. This model integrates the findings of previous models, identifying demographic, external and internal factors as behaviour-shaping. External factors include institutional constraints, economic (financial) means, social and cultural norms, as well as political support. Internal factors are various and seem to exert a significant impact on individual behaviour (Dietz et al. 1998). The intensity and direction of internal motivation has a significant impact on individual behaviour. Primary motives determine the ambition to lead an environmentally friendly life, whereas selective motives influence a certain action (driving or biking when it is raining). Environmentally conscious behaviour is often hampered by non-environmental motivations of higher intensity (e.g. convenience). Selective motives often “override” primary motives.

Most empirical research came to the conclusion that although the knowledge of environmental problems raises concern in people, this per se is not sufficient to lead to an environmentally conscious form of behaviour. Fliegenschnee and Schelakowsky (1998) claim that 80% of motives influencing environmental awareness or the opposite can be traced back to situational or internal, but not knowledge-related factors. This statement is supported by the striking experience of Kempton et al (1995), according to which the lack of ecological knowledge was of the same degree amongst committed environmentalists as among neutral respondents or amongst those opposing environmental protection. It can also be observed that certain incentives (e.g. economic advantages), cultural values and social norms may encourage individuals to act in an environmentally friendly manner even if they are not driven by concerns about the environment. In the latter case, we cannot ignore the fact that such non-aware or unaware environmentally friendly behaviour is not durable and in the absence of incentives easily reverses, because it is not based on the individual's internal conviction and set of values.

The value system of the individual is most strongly shaped by the stimuli coming from the immediate environment (family, friends, neighbours, teachers, etc.). This is followed by media and politics as influencing factors in the broader environment; and next is the cultural context in which the person lives. Value orientation also has a key role in behaviour. Nordlund and Garvin (2002) come to the conclusion that people with a cooperative value orientation were more aware of threats to the environment and felt a stronger moral obligation to act than persons who gave priority to self-enhancement values.

Regarding attitudes, Diekman and Franzen (1996) claim that the sacrifice required by environmental awareness (e.g. costs, time, efforts) can diminish the positive impact of attitudes on willingness to act. In their research, positive environmental attitude showed significant relation only with behaviour demanding moderate sacrifice (such as selective waste disposal). However, individuals with positive environmental attitudes dispose of a stronger willingness to support political measures which aim to encourage environmentally aware behaviour. This also means that these individuals accept indirect motivation vis-à-vis their own behaviour, they support the application of adequate environmental policy measures to reverse the situation and reduce the relative costs of environmentally aware behaviour.

Chawla (1998) highlights the importance of emotional involvement in shaping individual beliefs, values and attitudes. If external information contradicts

our prevailing beliefs, the ambition to achieve internal consistency leads to a selective perception of information, i.e. we make efforts to avoid cognitive dissonance (see Festinger 1957). If the feelings of fear, sorrow, pain, anger or guilt are accompanied by the conviction that our behaviour does not have any effective influence on the solution, these emotions lead us to non-action. In addition, negative emotions give rise to secondary psychological responses by means of which the human being makes efforts to get rid of these emotions. These defensive mechanisms might take the form of denying the problem (refusal of reality), rational distancing, apathy and resignation (the inability to change), or delegating the problem to other people (passing the buck), in order to dispose of the feeling of guilt.

Our sense of responsibility is significantly shaped by our values and the locus of control (internal or external, depending on personality). In addition, the individual sets priorities amongst which his/her and his/her family's well-being is usually the first (Kollmuss and Agyeman, 2002). If environmentally conscious behaviour is in line with personal priorities, the motivation to act increases (for example, purchasing organic food). If these two factors are contradictory, the likelihood of action is smaller (for example, purchasing a smaller flat, even if the individual could afford to have a bigger one). Furthermore, established habits generally prevent the individual from pursuing environmentally aware behaviour (Arbuthnott, 2009).

According to empirical research (see Jaeger et al., 1993 and Dietz et al., 1998), *socio-cultural factors* like group identity (Bonaiuto et al., 1996), group norms related to pro-environmental behaviour (Widegren, 1998), or the character of interpersonal relations (Jaeger et al. 1993) have a stronger influence on individual environmental awareness than the general concern about ecological problems or socio-demographic variables (e.g. age, gender).

Regarding the pro-environmental behaviour of students, Kagawa (2007) found in her survey of 5729 respondents that most students think of "light green" actions when talking about lifestyle change, such as changing purchasing habits by choosing products which are organic, fair trade, healthy, or stem from socially responsible companies, recycling, saving energy and/or water, as well as using public transportation. Reducing consumption was only mentioned by 1% of respondents as an option that students would be ready to do for a more sustainable personal life. Kagawa detected some dissonance between students' perceptions of sustainability and their reported behaviour patterns. Respondents tend to agree with radical statements but they refuse radical changes in their

personal life as well as at community or societal levels. The maintenance of economic growth is a goal which is not questioned by the respondents. A combination of optimism and pessimism, and mixed feelings towards the future of society were detected by Kagawa, who states that the development of empowering pedagogies should be able to educate students as “change agents”. She believes that in our “rapidly changing and uncertain world faced by sustainability-oriented challenges higher education needs to play an increasingly significant role in helping students become active responsible citizens” (Kagawa, 2007, p. 335).

There have been previous surveys in Hungary addressing the topic of environmental consciousness (see e.g. Kerekes and Kindler, 1993; Székely et al., 2011, Csutora, 2012), but these examined the population as a whole and did not focus on the behaviour of young people/students. Hunyadi and Székely (2003), as well as Székely (2011), provide an overview on the psychology of consumption, with explanation of the motivational background and operation of today’s consumer society as the key obstructive phenomena to sustainable development. Kraiciné Szokoly and Czippán (eds., 2011) summarise studies on the education and communication for sustainable consumption. In the framework of this book, Nagy (2011) analysed specifically the attitudes of students to sustainability and their knowledge on environmental issues, by carrying out a focus group- and a questionnaire-based survey. Due to her results, students specialized in androgogy are significantly split according to the depth of their knowledge on sustainability issues. Half of them are deeply, the other half however just superficially aware of those issues which are preconditions for the evolution of conscious consumer behaviour and lifestyle.

The following sections present the research at Corvinus University of Budapest, beginning with an overview of the sample characteristics followed by the description of our main findings.

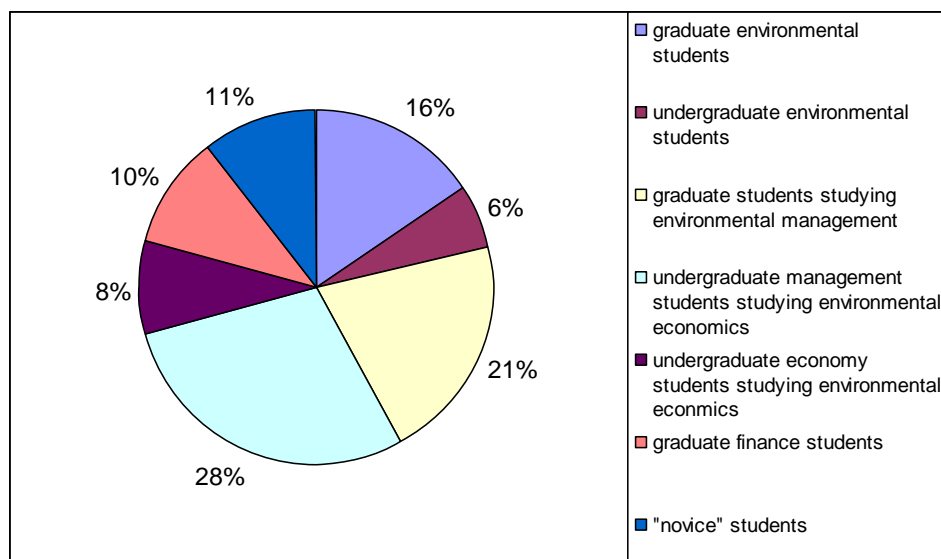
## Sample characteristics

Our sample of 436 students consisted of the following student groups (see Figure 1):

- Graduate level management students specialising in the environmental field (n=68)

- Undergraduate level management students specialising in the environmental field (n=25)
- Graduate level management students taking a course on environmental management (n=90)
- Undergraduate level management students taking a basic course on environmental economics (n=125)
- Undergraduate level economics students taking a basic course on environmental economics (n=37)
- Graduate level management students specialising in finance (n=45)
- First year “novice” students right at the start of their university education (n=46).

**Figure 1.** Breakdown of the sample according to student groups



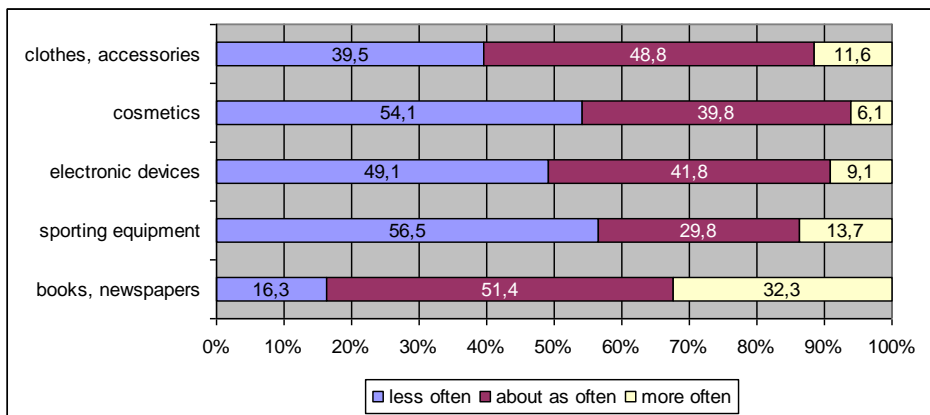
The gender ratio (female:male) in the overall sample is 2:1, age ranges between 18 and 23 years. The majority of respondents come from families with two children and have parents with university or college degrees. 44% of students in the sample are from Budapest or its surroundings, only 8% from villages. Nearly half of respondents still live with their parents, 18% in their own, and 15% in rented apartments. 17% are staying in student dormitories. 42% do not work parallel to their studies, 30% work occasionally and 28% on a regular basis. Concerning their financial resources, the role of the parents is also dominant, mostly in the form of a regular allowance, while 35% ask the parents for

money as needed. More than 40% also rely on scholarship payments, only 6% took student loans. 30% also cited work as an important source of their income. 46% of respondents spend less than 30 thousand Ft per month over and above housing and groceries, while almost a quarter spend more than 60 thousand Ft and almost 10% more than 100 thousand Ft which is a high amount in the context of Hungarian university students.

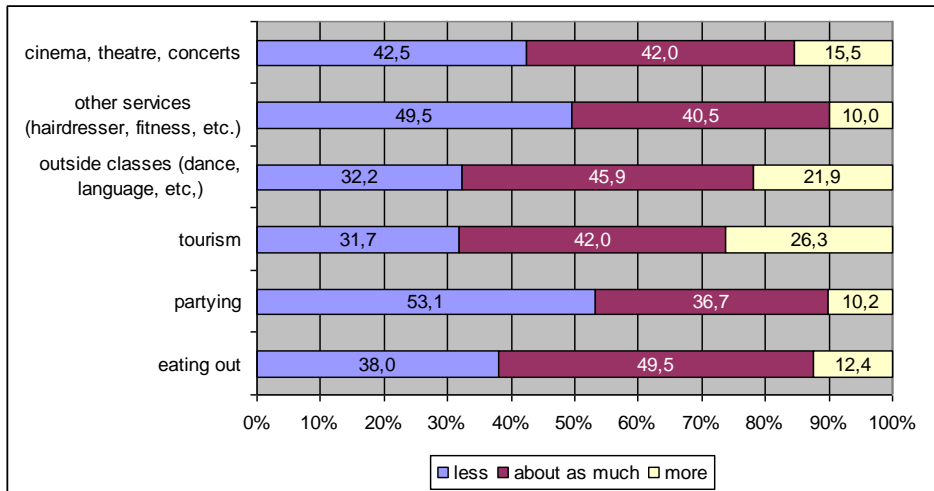
## Description of students' consumption patterns and pro-environmental behaviour

Regarding their own consumption, students in general tend to believe that they shop and spend less on certain goods than their peers. It is only books and newspapers that a third of the sample consider themselves to be buying more often than the average, and also 26% are spending more on tourism. For most categories however, such as clothes, sporting equipment, cosmetics, electronic devices, partying and other services, most respondents reported a lower level of consumption. The distribution of responses can be seen in Figure 2 and Figure 3. Self reporting bias is a clear possibility; respondents tend to underestimate their spendings compared to the average.

**Figure 2.** Compared to other university students, how often do you buy...





**Figure 3.** Compared to other university students, how much do you spend on...

Statements related to their shopping habits were rated by the respondents on a 6-level scale (Figure 4). The highest average was reached by the statement „I only buy things if I really need them”, indicating that students believe their consumption patterns to be free from excesses. They also evaluate themselves positively in that they do not shop only because they have money or for the sake of pleasure. However, the average of answers was also higher than the neutral level for finding it difficult to resist discounts and for trying to keep up with fashion/technological trends.

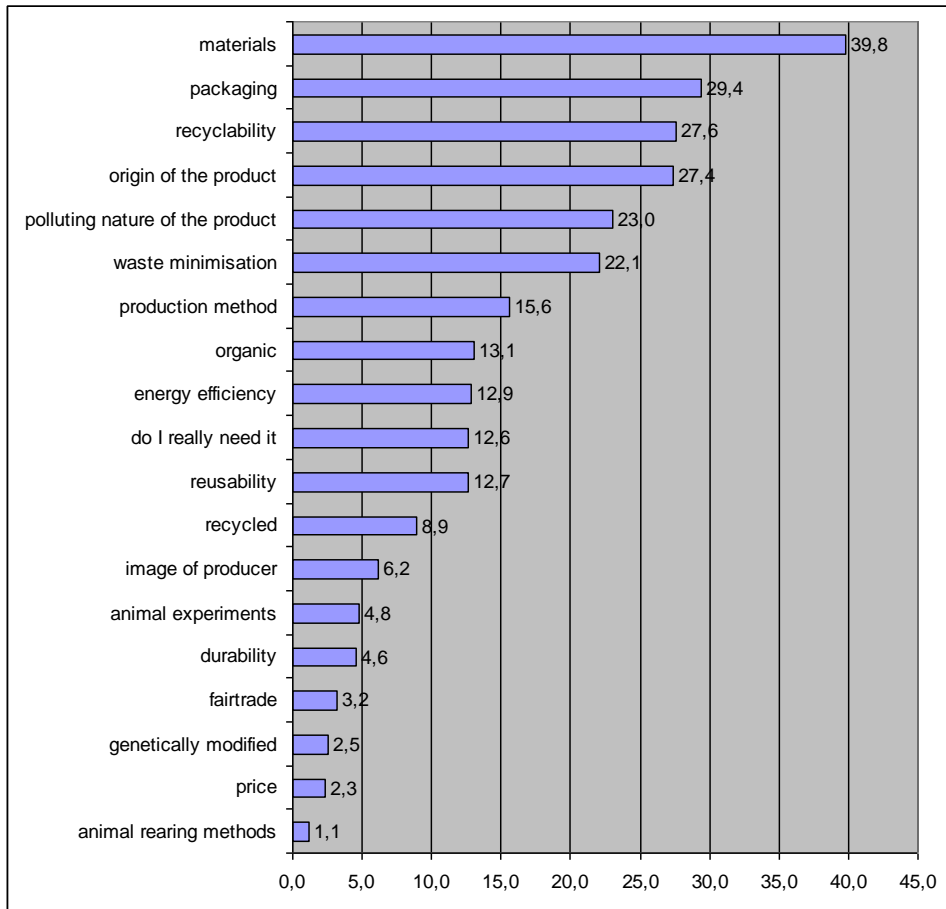
**Figure 4.** How well do the following statements describe your shopping habits? (averages, 1 to 6 scale)



This results in contradictions even on the level of stated behaviour, as it is difficult to imagine for example that one should need and therefore buy all goods offered at a discount price. Regarding shopping, multiple decision factors are at play which can have opposite effects. Furthermore, considerations on which goods are truly necessary may vary considerably between individuals.

Looking at the student groups in the sample, we found significant differences in their stated consumer behaviour. Among economics students, it is relatively common to shop for the sake of pleasure or because they have money, and they also tend to follow fashion and technological trends more than the average. The last is also true for first year students. On the other end of the spectrum, it is somewhat surprising that it is the finance students who don't shop for fun or spend any money they happen to have. This is probably not due to this group being more environmentally conscious than the others, but may perhaps rather be explained by their highly rational behaviour regarding the value of money, for example preferring to save and invest for a long term benefit.

The survey included an open-ended question on students' opinion as to what factors need to be considered during shopping for the sake of the environment, and to what extent they take these into account in their shopping decisions. The factors named were coded into 19 categories, the frequency of mentions for each of these is shown in Figure 5.

**Figure 5.** Incidence of factors to be considered during shopping

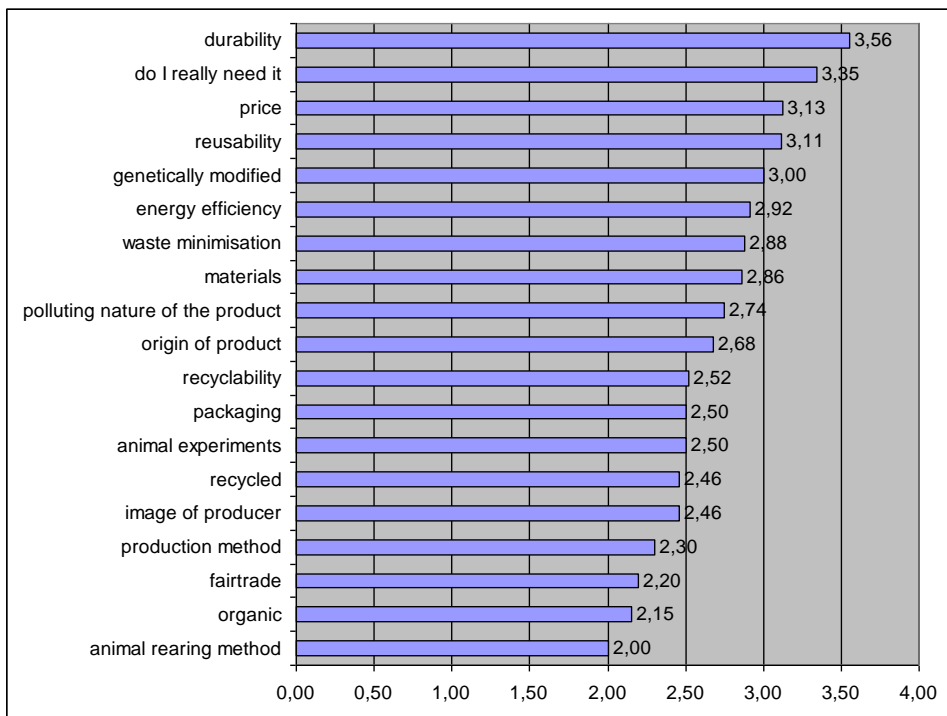
The factors mentioned most often were: the materials the product is composed of, the packaging, the product's recyclability, its origin, its polluting nature, and also minimizing waste by choosing economy size packages. Looking at the level of environmental consciousness reflected in the closed-ended questions, we would have expected most factors to be mentioned much more frequently (for example the actual need for the product in question) – thus the gaps in environmentally conscious behaviour became fairly evident with this question.

The factors mentioned are also at least sometimes taken into account in practice (the end points of the scale were 1: I never take it into account and 4: I

always take it into account); of the factors named frequently, those taken into account the most often are the materials, origin and polluting nature of the product, and waste minimization by buying larger units (see Figure 6). Here, it is interesting to observe that the majority of students, while naming environmental considerations, does not actually take these into account often enough. Thus, consciousness on the level of knowledge does not translate sufficiently into action. However, responses seem far more honest in case of this question than when respondents are only required to make general statements about their environmental consciousness or consumer behaviour.

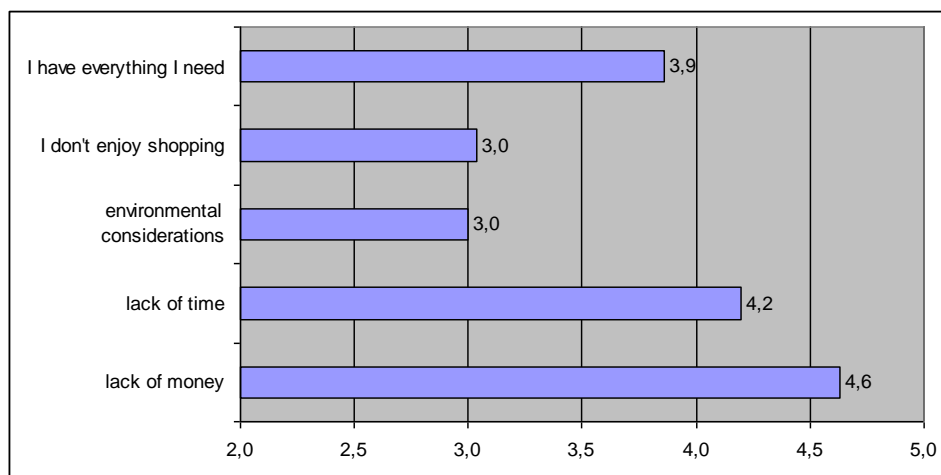
In some cases we could also observe consistent behaviour, as with those students who named aspects of durability, necessity, recyclability and genetic modifications and almost always consider these in their shopping decisions (see Figure 6).

**Figure 6.** Actual consideration of factors when shopping  
(amongst those who mentioned them)



It might be interesting to look at what factors prevent students from shopping more than they currently do (the scale is on 6 levels from 1), as this provides some indication of how their consumer behaviour might change if these barriers are removed – this time in the direction of higher consumption. The factor reaching the highest average (4.6) is the lack of money, which is not very favourable from the point of view of sustainability, since it means that students would gladly be consuming much more if they possessed the means. In second place is the lack of time (4.2), which can also strengthen the above mentioned tendency, although it is not necessarily likely that one would have more time for shopping next to work and family than as a university student. Giving ground for some optimism is the fact that possessing everything they need is also a hindering factor for many respondents (3.9). On the other hand, environmental considerations and dislike for shopping are of marginal importance (Figure 7).

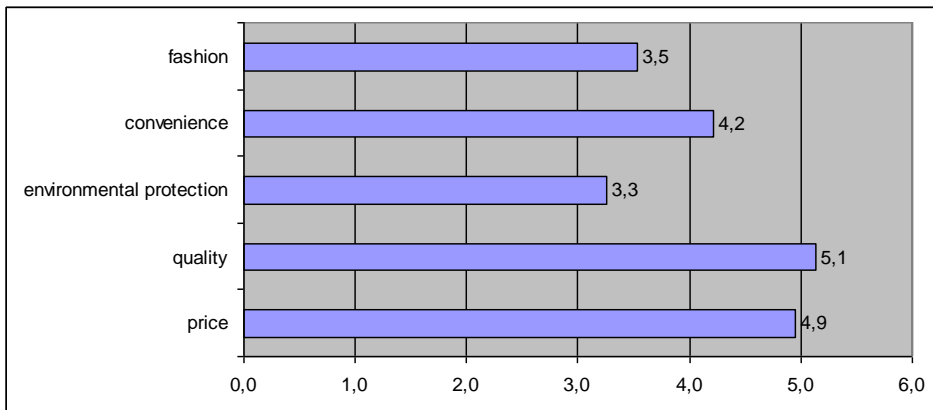
**Figure 7.** Barriers to higher consumption



We examined what factors influence students when choosing between products or services. We enquired about the role of price, quality, environmental protection, convenience/accessibility and fashion (the distribution of responses is shown in Figure 8, ranging from 1: not at all important to 6: extremely important). Interestingly, quality (average: 5.14) proved more important than price (4.95) – these are followed in order of importance by convenience and accessibility (4.20), fashion (3.53) and, lastly environmental protection (3.26).

Regarding fashion and environmental protection, we found significant differences in the results between various student groups. Fashion is most important for students of the economic faculty (3.81), and least for graduate level environmental students (3.01). Environmental protection is, as expected, most prominent for graduate level environmental students (3.73) and least for graduate level finance students (2.70).

**Figure 8.** The role of various factors in shopping decisions



One product that most young people today own, and which we assume they like to replace frequently is the mobile phone. Therefore, questions were included about the frequency of replacing their device and the reason for the last replacement. Surprisingly, most students reported to buy a new mobile phone less than once every two years, which can be considered acceptable since mobile service operators also draw contracts for this period (this also corresponds to the physical and psychological obsolescence of the product). Furthermore, 64% reported to have bought a new device only because the last one was no longer functioning properly and 18% because it was lost/stolen. 20% indicated favourable terms or definitely wanting to buy a new model as the reason for the purchase. This latter group are those who can be fairly easily convinced via marketing methods about the „necessity” of changing their mobile phone.

## Characterization of behaviour patterns by factor and cluster analysis

For in-depth analysis of the activities connected to an environmentally conscious lifestyle, first, a factor analysis was conducted, using the closed-ended questions on the subject. Several attempts were made at the inclusion of variables in order to arrive at a solution where the factors explain at least 60% of the original variance and have a meaningful content, and the KMO and Bartlett's test values are satisfactory. Finally, the variables involved could be grouped into seven factors<sup>1</sup> – the weights given to the variables in each factor can be seen in the rotated component matrix (Table 1). Based on their content, the factors were named as follows:

1. hedonistic consumer behaviour
2. environmental activist behaviour
3. increasing environmental knowledge
4. buying sporting equipment and electronic devices
5. supporting environmental NGOs
6. good housekeeping practices
7. not keeping electronic devices on stand-by.

The factor *hedonistic consumer behaviour* includes habits related to the consumer society such as shopping for the sake of pleasure, frequent buying of clothes and accessories, keeping up with fashion/technological trends, excessive spending, difficulty to resist discounts and not only buying necessary things (as indicated by the negative sign). The factor *environmental activist behaviour* signifies specific community activities (e.g. collecting litter), participation in environmental demonstrations and performing volunteer work for environmental NGOs. *Increasing environmental knowledge* comprises activities such as reading books, journals or internet sites related to environmental protection or attending conferences on the topic. The factor *buying sporting equipment and electronic devices* contains precisely these activities. *Supporting environmental NGOs* means membership in and financial support of such organizations. *Good housekeeping practices* is composed of turning off the lights and the computer, but despite all efforts, not keeping electronic devices on stand-by constitutes a separate factor.

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<sup>1</sup> The analysis was conducted by SPSS using principle component analysis with Varimax rotation. The result was obtained in 6 iterations. The KMO value is 0.75, the result of the Bartlett test is 1639.492, the variance explained is 62.56%. The eigenvalue of the 7<sup>th</sup> factor is just below 1, but its inclusion increases variance explained by almost 5%.

Table 1. Rotated component matrix

|   | 1:<br>hedonistic<br>consumer<br>behaviour | 2:<br>environmental<br>activist<br>behaviour | 3:<br>increasing<br>knowledge | 4:<br>buying<br>sporting<br>equipments<br>and electronic<br>devices | 5:<br>supporting<br>environ-<br>mental<br>NGOs | 6:<br>good<br>house-<br>keeping<br>practices | 7:<br>not keeping<br>devices on<br>stand-by |
|---|---|--|-------------------------------|---|--|--|---|
| <b>Factors<br/>Variables</b>  |   |  |                               |   |  |  |   |
| Shopping for the sake of pleasure   | <b>0.740</b>                              | -0.040                                       | 0.038                         | -0.136  | 0.135  | -0.243                                       | 0.009                                       |
| Frequency of buying clothes and accessories compared to other university students | <b>0.717</b>                              | 0.061  | -0.109                        | 0.232   | 0.011  | 0.048  | 0.231                                       |
| Keeping up with fashion/technological trends                                      | <b>0.698</b>                              | -0.013                                       | -0.016                        | 0.360   | -0.094   | 0.006  | 0.102                                       |
| Buying something when having money  | <b>0.666</b>                              | -0.114                                       | 0.065                         | -0.083  | 0.044  | -0.186                                       | -0.223                                      |
| Difficulty to resist discounts  | <b>0.660</b>                              | -0.012                                       | -0.068                        | -0.196  | -0.012   | 0.111  | -0.088                                      |
| Frequency of buying cosmetics compared to other university students               | <b>0.651</b>                              | 0.005  | -0.043                        | 0.151   | -0.052   | 0.254  | 0.057                                       |
| Buying things only if needed  | <b>-0.648</b>                             | 0.127  | -0.018                        | 0.106   | -0.060   | 0.228  | 0.083                                       |
| Environmental activities (eg. collecting litter)                                  | -0.067                                    | <b>0.798</b>                                 | -0.082                        | -0.031  | 0.065  | -0.027                                       | 0.055                                       |
| Participation in environmental demonstrations                                     | -0.059                                    | <b>0.798</b>                                 | 0.145                         | 0.042   | 0.146  | -0.013                                       | 0.013                                       |
| Volunteer work for environmental NGOs   | -0.029                                    | <b>0.681</b>                                 | 0.249                         | -0.037  | 0.104  | 0.019  | -0.109                                      |
| Browsing the internet on environmental issues                                     | -0.118                                    | 0.057  | <b>0.801</b>                  | 0.073   | -0.016   | 0.007  | 0.042                                       |



|  | 1:<br>hedonistic<br>consumer<br>behaviour | 2:<br>environmental<br>activist<br>behaviour | 3:<br>increasing<br>knowledge | 4:<br>buying<br>sporting<br>equipments<br>and electronic<br>devices | 5:<br>supporting<br>environ-<br>mental<br>NGOs | 6:<br>good<br>house-<br>keeping<br>practices | 7:<br>not keeping<br>devices on<br>stand-by |
|--|---|--|-------------------------------|---|--|--|---|
| <b>Factors<br/>Variables</b>   |   |  |                               |   |  |  |   |
| Reading books/articles on environmental issues                               | 0.083                                     | 0.140  | <b>0.767</b>                  | 0.023   | -0.026   | 0.072  | 0.010                                       |
| Participation in conferences on environmental issues                         | -0.043                                    | 0.062  | <b>0.639</b>                  | -0.122  | 0.295  | 0.077  | 0.076                                       |
| Frequency of buying sporting equipment compared to other university students | -0.065                                    | -0.005                                       | -0.024                        | <b>0.802</b>  | 0.049  | -0.005                                       | 0.004                                       |
| Frequency of buying electronic devices compared to other university students | 0.070                                     | -0.020                                       | 0.030                         | <b>0.776</b>  | -0.013   | -0.145                                       | -0.094                                      |
| Being a member of environmental NGO  | 0.032                                     | 0.171  | -0.016                        | -0.061  | <b>0.816</b>                                   | -0.052                                       | 0.032                                       |
| Supporting environmental NGO financially                                     | 0.043                                     | 0.123  | 0.173                         | 0.113   | <b>0.773</b>                                   | 0.128  | -0.035                                      |
| Turning off the computer when not in use                                     | 0.001                                     | 0.028  | 0.137                         | -0.185  | -0.028   | <b>0.765</b>                                 | -0.005                                      |
| Turning off the lights when leaving the room                                 | -0.104                                    | -0.055                                       | 0.013                         | 0.009   | 0.098  | <b>0.757</b>                                 | 0.019                                       |
| Not keeping electronic devices on stand-by                                   | -0.019                                    | -0.036                                       | 0.118                         | -0.092  | 0.007  | 0.011  | 0.933                                       |

The factors identified – with the exception of perhaps the last two factors – contain easily distinguishable patterns of behaviour, providing a good basis for dividing respondents into distinct groups via cluster analysis. This compression of data naturally results in loss of information, however, performing the cluster analysis using too many variables would have rendered the analysis far too complicated. In the experimental phase mainly hierarchical clustering methods were used (eg. between groups linkage and Ward method). We considered various solutions (with 3, 4 and 5 clusters) in order to find one where all factors used as grouping variables are significant, and the clusters obtained are distinct and allow suitable interpretation. A solution with 6 clusters was finally chosen, containing 398 respondents in total.

The result of the cluster analysis performed by the Ward method can be best seen in the Means table (Table 2), showing the number of respondents assigned to each cluster, the averages of the factors used in the analysis for each cluster as well as the standard deviations within the clusters. It is central to the „reliability” of the analysis that each cluster should contain a suitable number of respondents. The solution described fulfills this requirement, as the clusters contain 114, 125, 43, 13, 18 and 85 respondents respectively. Another important requirement is that the standard deviations should be relatively small. This is the least true in case of cluster 4, but is still tolerable.

The averages of the factors as variables and their sign indicate the strength and direction with which each factor is present in each cluster. The ANOVA table shows that all factors included in the analysis are significant.



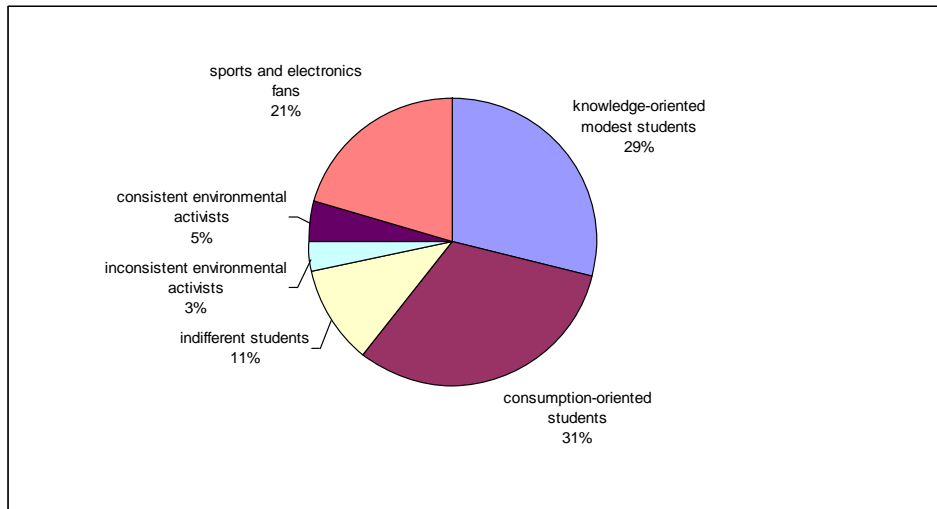
| Best 6 clusters<br>(excluding 8 outliers) |           |           | Hedonistic<br>consumer<br>behaviour | Environ-<br>mental activist<br>behaviour | Increasing<br>environ-<br>mental<br>knowledge | Buying<br>sporting<br>equipment &<br>electronic<br>devices | Supporting<br>environmental<br>NGOs | Good<br>housekeeping<br>practices | Not keeping<br>devices on<br>stand-by |
|---|-----------|-----------|-------------------------------------|--|---|--|-------------------------------------|-----------------------------------|---------------------------------------|
|   | Mean      | Std. Dev. |                                     |  |   |  |                                     |                                   |                                       |
| Sports and electronic device<br>fans      | Mean      |           | -0.0134949                          | -0.1456462                               | -0.1291012                                    | 1.1972761  | -0.3297009                          | -0.1318013                        | 0.1615021                             |
|   | N         | 85        |                                     | 85                                       | 85  | 85   | 85                                  | 85                                | 85                                    |
| Total                                     | Mean      |           | 0.96801956                          | 0.61829801                               | 0.73943846                                    | 0.69628409   | 0.93373030                          | 0.47223379                        | 0.45936606                            |
|   | N         | 398       |                                     | 398                                      | 398   | 398  | 398                                 | 398                               | 398                                   |
|   | Std. Dev. |           | -0.0020241                          | -0.0261804                               | 0.0055522                                     | 0.0065319  | 0.0080944                           | -0.1157807                        | -0.0089516                            |
|   | Std. Dev. |           | 0.99850536                          | 0.95787454                               | 0.98216126                                    | 1.00089808   | 0.98206378                          | 0.55907791                        | 0.99809585                            |

Using the Means table (Table 2) we grouped respondents in the following clusters:

- Cluster 1: Knowledge oriented modest students (114)
- Cluster 2: Consumption oriented students (125)
- Cluster 3: Indifferent students (43)
- Cluster 4: Inconsistent environmental activists (13)
- Cluster 5: Consistent environmental activists (18)
- Cluster 6: Sports and electronic device fans (85).

The proportion of students belonging to each cluster is shown in Figure 8.

**Figure 8.** Proportion of students in each cluster



In the next step, the characteristics of each cluster were examined, as well as the clusters' relationship to the various student groups in the sample. Regarding the characterization of the clusters, the focus is on the difference of the cluster averages from the sample average according to each factor. These relative proportions are more important than the distributions in themselves, as those result from the sample characteristics.

### *1. Knowledge-oriented modest students*

The most important characteristic of this group is that its members (114 students) read substantially more books and internet content related to environmental issues than the average, and they also like to attend conferences on this topic. They are often members or financial supporters of environmental NGOs. Good housekeeping practices are also present to a certain degree (however, they fall below the average when it comes to not leaving electronic devices on stand-by). On the other hand, all factors related to consumption have a negative sign, meaning that this group is not hedonistic and doesn't spend much on sports equipment and electronic devices. It is interesting that these students also avoid „showing off” their environmental orientation attending demonstrations or doing volunteer work for green NGOs.

Graduate level students environmental feature in this cluster twice as heavily as in the overall sample, 52% of them fall into this group. Undergraduate students with environmental specialization are also somewhat overrepresented. The two student groups who are underrepresented in this cluster are undergraduate management and economics students taking a basic course on environmental economics.

### *2. Consumption-oriented students*

Although consumerist attitudes – presumably due to the self-reporting nature of the survey – are not highly characteristic for the overall sample, these 125 students seem more consumption-oriented compared to the other clusters. This is primarily reflected in the frequent purchase of clothes, cosmetics and accessories, the pleasure in shopping and spending money, the attraction towards discounts and the following of fashion trends – however, not at all in the frequent purchase of sporting equipment and electronic devices. This group is apparently not engaged in environmental protection, whether it comes to the level of collecting information, activist behaviour or good housekeeping practices. However, some are members of environmental organizations or provide these with financial support. The latter could be explained (just like their hedonist consumer behaviour) by the relatively good financial situation that is characteristic for students in this cluster.

In the consumption-oriented cluster, all seven student groups are represented according to their presence in the overall sample, with slightly more

undergraduate management students studying environmental economics. Contrary to the expectations, the graduate finance students used as a control group are slightly underrepresented. In this cluster, the proportion of female students is much higher than in the sample (89% instead of 65%).

### *3. Indifferent students*

43 respondents were assigned to the cluster of indifferent students. They do not exceed the sample average any of the factors (except, minimally, not leaving electronic devices on stand-by). They do not support environmental organizations at all, but it is also characteristic that they do not buy sporting equipment or electronic devices. Thus, they can be considered indifferent regarding both the environment and consumerism.

The proportion of economics students in this group is more than double compared to their rate in the overall sample, and first year „novice” students are underrepresented.

### *4. Inconsistent environmental activists*

This is a relatively small group consisting of 13 respondents. They can be characterized by active participation in environmental demonstrations, conferences, they are often members and financial supporters of environmental NGOs. They are interested in environmental protection, browsing the internet and reading books and journals on the topic. Regarding their consumer behaviour, they are also more active than the average, they like to shop for sporting equipment, electronic devices, clothes and cosmetics and follow fashion trends. They do not tend to practice good housekeeping measures, e.g. they leave electronic equipment and lights turned on when not in use. This result indicates that various aspects of environmental consciousness do not always go hand in hand within individuals. Those who consume less are not necessarily active in demonstrations and vice versa. Also, activist behaviour – especially financial support to environmental groups – often serves as a compensation for an environmentally unfriendly lifestyle.

It is contrary to expectations that graduate students specialized in environmental issues are not overrepresented in this cluster. Surprisingly overrepresented are the two control groups, the graduate finance students and

the „novice” students. None of the economics students got assigned to this cluster. (These results have to be interpreted carefully as the cluster only includes 13 respondents.)

### *5. Consistent environmental activists*

This is a group of 18 students who are mainly characterized by their above average participation in environmental demonstrations, membership and support of environmental NGOs and volunteer work. However, increasing their knowledge base does not seem to motivate them, which supports the findings of Chawla (1998) that knowledge and information is not among the strongest drivers for members of environmental organizations<sup>2</sup>. These students are not interested in consumption, they have the second lowest score on hedonistic behaviour, and also do not buy sporting equipment and electronic devices. In their everyday lives they are only active in not using the stand-by function of electronic devices but do not pay attention to turning off the lights and the computer.

Among the consistent environmental activists, graduate students specialized in environmental issues are overrepresented, as are, somewhat surprisingly, the graduate students studying environmental management. Although the latter group did not choose an environmental specialization, they are nevertheless interested in these issues. The proportions of the two control groups are, as expected, only half of those in the overall sample.

### *6. Sports and electronic device fans*

The members of this group (85 students), as is indicated by the name, buy sporting equipment and electronic devices far more often than their peers, while their consumer behaviour regarding other aspects, such as shopping for the sake of pleasure, following fashion trends and buying clothes and cosmetics can be considered average or even slightly more modest. They are not at all interested

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<sup>2</sup> According to Chawla (1998), the environmental orientation of professional environmental activists is mainly based on childhood experiences in nature, environmental values of the family, the influence of environmental organizations, role models (friends, teachers) and education-formation (in decreasing order of importance). This means that the knowledge increasing role played by formal education, although relevant, is not as important as the shaping of attitudes.



in environmental issues or activism, they neither read on the subject, nor attend demonstrations or support environmental groups.

Regarding the student groups, we can find far more undergraduate management students studying environmental economics here, and less of those specializing in the environmental field. Other groups are generally present in average proportions. Looking at the gender distribution, the high share of male respondents in this cluster is apparent (while in the overall sample, the female:male ratio is 2:1, in this group it is 1:2).

## **Limitations**

As in questionnaire-based surveys, self-reporting bias is observable in case of attitude questions and closed-ended questions inquiring about environmentally aware consumer behaviour. However, this means that detected gaps in reported and experienced behaviour of students are in reality even larger, making these inconsistencies even more urgent to address when designing policy and programs for sustainable consumption and effective environmental education.

The research does not cover a longer time horizon, therefore lifestyle changes and longer-term impacts of environmental education on consumption patterns of students can be measured only based on repeated surveys or with the help of a different research methodology.

## **Conclusions and further research needs**

The main goal of our research was to examine the consumer behavior of students of the Corvinus University of Budapest: the sustainable features of their consumption patterns, the degree to which they take environmental considerations into account in their consumption decisions and the consistency of their stated attitudes and actual behaviour. Results show a highly mixed picture.

Sensitivity toward environmental issues does not always go hand in hand with modest, carefully considered, waste-minimizing – thus sustainable – consumption. Environmental consciousness appears quite selectively, in some cases through moderate consumption, in other cases through activist behaviour,

but it rarely covers all aspects of life. Compensating behaviour is widespread, when individuals balance certain unsustainable habits by other pro-environmental activities. At the same time, it can be observed that an attraction to certain products does not always mean overall hedonistic behaviour with high consumption in all categories. There are a lot of young people who do not differ from the average in any dimension: their consumption is not excessive but their concern for environmental issues is also limited.

Identifying and characterizing distinct groups is important in order to be able to find the most effective education tools suitable for promoting students' environmental knowledge, values and attitudes, and also for pushing their lifestyle and consumption patterns into a more environmentally friendly, consistent, sustainable direction. We assume that providing the knowledge-oriented group with the relevant practical guidance could help transfer their knowledge into day-to-day action. For the groups living according to the norms of the consumer society, supplying attractive environmentally friendly alternatives (products and services) that require minimum sacrifice could provide a solution – this also applies to those who are only interested in certain categories of goods. In case of the inconsistent environmental activists, the emphasis needs to be placed on the factors causing the inconsistency. For the consistent environmental activist group, providing positive feedback is the most important to encourage them to persevere in a lifestyle which often requires sacrifices. The indifferent group is likely to be the most difficult to motivate, as the lack of interest is likely to prevent any change of the status quo. In their case it would probably be more helpful to find other (non-environmental) incentives which currently influence their behaviour and could also be in line with sustainability (e.g. low consumption to save money).

Thorough consideration and adaptation of possible tools to the various groups is the subject of research currently in the starting phase, with results to be discussed later.

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