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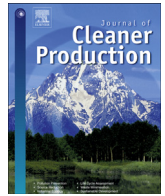
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# Business students' value priorities and attitudes towards sustainable development

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## ABSTRACT

Business students of today are future executives in companies and governments. Therefore, their education for sustainability needs to be carefully considered. However, very little is known about business students in terms of their value priorities and attitudes towards sustainable development. Value priorities guide attitudes, but they are more abstract and long-lasting. Teachers who understand their students' value priorities and attitudes could develop and customize their teaching accordingly. Our goal in this study is to measure business students' value priorities and their attitudes towards sustainability. We compare the results obtained from students in a university business school with a comparable nationwide sample. Our results show that there are differences in almost all values among business students and the comparable sample, in particular in universalism and power. Interestingly, attitudes to sustainable development are equally or even more favorable among business students. As a theoretical contribution in the field of education for sustainability we combined Sterling's three levels of sustainability education into our considerations and suggest that the evolution of students' values and sustainability attitudes measured regularly should be reflected against them or a corresponding categorization.

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## 1. Introduction

Education for sustainability in higher education has gained strongly increasing attention. The search in Web of Knowledge with "higher education" and "sustainable development" in December 2018 ended at 23 titles before 2016 and 1068 after that, just to give an example. Numerous views have been adopted in the education design. However, very scarce attention has been devoted to the students themselves whose capabilities and characteristics affect the reception of new views and are at the core in terms of achieving the sustainability goals.

A commonly adopted definition of sustainable development is that of the Brundtland Commission: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987; 43). In the literature this and the other slightly different definitions by the commission

seem to dominate the field. Pappas (2012; 2), for example, provides a less general definition but similar in spirit emphasizing the sustainable society's "ability to continue to survive and prosper indefinitely, not just with respect to environmental resources and economic development, but also with respect to quality of life" (the lengthy definition is only partly quoted). The majority of articles considered for writing this paper paid very scant attention to the definition of sustainable development; similarly, we adopt the most common definition by Brundtland Commission. The literature today concentrates largely on discussing and defining the different areas of sustainable development such as economic, social and ecological (e.g., Pappas et al., 2013; Korhonen, 2007). As for education for sustainability UNESCO (What is education, n.d.) states that it "empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity." More than 700 business schools and related institutions have agreed on the United Nations (UN) principles for responsible management education (PRME) (see, e.g. Godemann et al., 2014).

Knowing the students is a key factor in achieving objectives in the implementation of new contents in the curriculum. Supported by several researchers, (e.g. Pappas et al., 2013; Sipos et al., 2008;

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Shephard, 2008; Sibbel, 2009) Sidiropoulos (2014) states “each person or group interprets sustainability through their own value lens, so messages promoting sustainability need to be positioned according to the receptivity (value driver) of the audience”. That motivates our study.

To improve the positioning of the teaching we aim to widen and deepen the knowledge about business students, more precisely their value priorities and sustainability attitudes. Field and Tunna (2011) illustrate the challenge as follows: “education and awareness raising, as strategies on their own, are highly unlikely to induce behavioral change”. There is thus a need to increase knowledge about students, and accordingly carefully to redesign education curricula – Sidiropoulos (2014; 474) points out that “...education for sustainability activities for tertiary students could have an impact in the coming years if carefully positioned to account for differences in student values for the environment and sustainability”. In this sense, there is an analogy with modern marketing in which offerings are customized according to the characteristics and needs of the consumer. Our empirical focus in this study, therefore, is on the sustainability attitudes and value priorities of business students. The results could provide a basis on which to consider the repositioning of teaching.

Few studies thus far focus on measuring the values of business students. The ones that do used different scales (see a review by Payne, 1988; Neubaum et al., 2009; Kelley and Nahser, 2014; Oliver, 1999; Florea et al., 2013; Myyry and Helkama, 2001; Verkasalo et al., 1994), which makes comparison difficult. As for attitudes towards sustainability, Lambrechts et al. (2018) studied a sample of 458 business students with an aim to reveal different segments of attitudes. However, none of the studies mentioned simultaneously consider both values and attitudes to sustainable development among business students.

In our study value priorities refer to Schwartz’ scale of values (Schwartz, 1992, 1994) also pointed out by Sidiropoulos (2014). The Schwartz approach is a well-validated theory setting out a full range of basic values based on hundreds of studies carried out in more than 80 countries (Schwartz, 2012). Value priorities affect the achievement of goals, evaluations and choices in human life, which we discuss in more depth below.

According to the results of previous studies, business students differ in their value priorities as measured on the Schwartz scale from students in other fields (Myyry and Helkama, 2001; Verkasalo et al., 1994). Studies comparing values in different vocational contexts (Sagiv, 2002) and occupations have produced results that show similarities among business students and people in business environments, for example (Knafo and Sagiv, 2004). The field of study has proved to be an even stronger determinant of value-priority formation than nationality in comparisons of the value priorities of students in different countries (Verkasalo et al., 1994). Value priorities and attitudes towards sustainability have not thus far been measured simultaneously among business students, making it impossible to analyze how value priorities and attitudes are related. However, the relationship has been examined in some studies (see, e.g. Karp, 1996; Schultz et al., 2005; Thøgersen and Ölander, 2002 with undergraduate students, social science students and Danish consumers in their samples).

Value priorities are more abstract and long-lasting, and are guiding attitudes. Both values and attitudes have an effect on how students are exposed by and react to educational materials related to sustainable development and are thus of core importance. Our goal is to compare business students’ value priorities and attitudes towards sustainability with nationwide samples. Our data comprises two representative samples of Finnish citizens (Schwartz for value priorities and TNS Kantar data for attitudes) – one including value priorities and the other sustainability attitudes. The samples

were filtered to eliminate those without the necessary level of education and adjusted for the age-gender distribution. The two nationwide samples do not have the same respondents. The primary aim is not to analyze the heterogeneity of business students but to compare the levels of value priorities and attitudes for sustainability with a comparable sample. Our results could benefit to all educators in business schools in their planning of classroom teaching as well as in the design of various educational programs.

## 2. Values, attitudes and sustainable development

### 2.1. The Schwartz scale of values

Personal values are general principles that guide people’s perceptions, goals, attitudes and behavior (Bardi and Goodwin, 2011). They refer to desirable goals that motivate action (Schwartz, 2011). There have been many efforts in the social sciences (see e.g. Hitlin and Piliavin, 2004; Rohan, 2000) to come up with a “conception of basic values, with the content and structure of relations among these values as well as of reliable empirical methods to measure them” (Schwartz, 2012). Value priorities indicate what is important in life for a person. The Roceach (1973) value survey was the first to be introduced, and it was applied intensely for some decades. Roceach values were divided into two categories: instrumental (preferable modes of behavior) and terminal (desirable end-states of existence). The Schwartz (1992) scale of personal values continued Roceach’s work, removed this categorization. There are some alternative scales but almost every one of those that was encountered in a literature search was based on the Schwartz system (for a list of alternatives, see Roccas et al., 2017). Two exceptions deserve mentioning: Basic Values Survey (Gouveia et al., 2014) and the Inglehard scale (Dobewa and Rudnev, 2014).

The circular structure of the Schwartz system seems to be culturally universal and the validity of the theory has been widely accepted (Schwartz, 2012). Samples in at least 67 nations have been gathered (Fischer and Schwartz, 2011) and the scale is widely adopted. The European Social Survey (ESS; [www.europeansocialsurvey.org](http://www.europeansocialsurvey.org)) carried out in each EU country uses the Schwartz scale as one module, and adopting the version of questions of the Schwartz system we were able to compare our business student sample with a corresponding representative Finnish sample. Also the World Values Survey uses the Schwartz scale (World Values Survey, n.d.).

The survey defines ten broad values according to the *motivation* that underlies each of them, and includes the core values recognized in a multitude of cultures. Values guide attitudes, which are learned ways in which to think, feel and behave in a certain way in a certain situation. Different people evaluate values in different ways – the more important a value is the more the person is willing to make efforts to achieve the value.

Schwartz (2011) describes the personal road to the emergence of his new system of values. These values are “grounded in universal requirements of human existence”, which are the “needs of individuals as biological organisms, requisites of coordinated social interaction and survival and welfare needs of groups” (p. 4). Schwartz’s basic values, their motivational contents and their grounding in the universal requirements are summarized below (applied from Schwartz, 2011, which gives more details and discussion about the related value concepts).

- **Self-Direction.** Motivation: independent thought and action; choosing, creating, exploring. Self-direction derives from organismic needs for control and mastery and interactional requirements of autonomy and independence.

- **Stimulation.** Motivation: excitement, novelty, and challenge in life. Stimulation values derive from the organismic need for variety and stimulation to maintain an optimal, positive, rather than threatening, level of activation.
- **Hedonism.** Motivation: pleasure and sensuous gratification for oneself. These values derive from organismic needs and the pleasure associated with satisfying them.
- **Achievement.** Motivation: personal success through demonstrating competence according to social standards. Competent performance that generates resources is necessary for individuals to survive and for groups and institutions to reach their objectives. Achievement values emphasize demonstrating competence in terms of prevailing cultural standards and thereby obtaining social approval.
- **Power.** Motivation: social status and prestige, control or dominance over people and resources. A dominance/submission dimension emerges in most empirical analyses of interpersonal relations. To justify this fact of social life and to motivate social-group members to accept it groups must treat power as a value. Power values may also be transformations of individual needs for dominance and control (this is the facet of power reflected in the questions used in this study<sup>2</sup>).
- **Security.** Safety, harmony, and stability of society, of relationships, and of self. Some security values primarily serve individual interests, whereas others serve wider group interests. Even the latter expresses the goal of security for self or those with whom one identifies.
- **Conformity.** Motivation: restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms. The values derive from the requirement that individuals inhibit inclinations that might disrupt and undermine smooth interaction and group functioning.
- **Tradition.** Motivation: respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self. Groups everywhere develop practices, symbols, ideas and beliefs that represent their shared experience and fate. They often take the form of religious rites, beliefs and norms of behavior.
- **Benevolence.** Motivation: preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group'). These values derive from the basic requirement for smooth group functioning and the organismic need for affiliation. Among the most critical are relations with family and other primary groups. Benevolence values emphasize voluntary concerns for the welfare of others.
- **Universalism.** Motivation: understanding, appreciation, tolerance, and protection of the welfare of all people and of nature. This contrasts with the in-group focus of benevolence values. Universalism values derive from the survival needs of individuals and groups. People may not recognize these needs until they encounter others beyond the extended primary group and become aware of the scarcity of natural resources. They may then realize that failure to accept others who are different and treat them justly will lead to life-threatening strife. They may also realize that failure to protect the natural environment will lead to the destruction of the resources on which life depends.

Fig. 1 depicts the motivational contents of values as a circular structure on two dimensions. Thus the system of values is a continuum in two dimensions where their pairwise distances can be

read. Values with similar motivational contents (e.g., achievement and power) have a small pairwise distance between them, whereas their distance from values with dissimilar motivational content (universalism and benevolence) is big: such values are located on the opposite side of the circle. For example, security and tradition are adjacent values with similar motivational content whereas security and stimulation are far from each other, having dissimilar motivational content. Note that the interpretation of the values and their (dis)similarity can be simplified considerably by reducing the values into two main axes as depicted in Fig. 1: The two ends of the first axis are conservation and openness to change where the values conformity, tradition and security form one group opposing the values hedonism, stimulation and self-direction. The second axis opposite ends are self-enhancement and self-transcendence. The values achievement and power form one group opposing universalism and benevolence. Thus out of the self-enhancement values the closest to openness to change is achievement and closest to conservation is power. Out of the self-transcendence values the closest to openness to change is universalism (caring for mankind and nature) and closest to conservation is benevolence that cares for welfare of those with whom one is in frequent personal contact.

Value priorities have been studied in numerous contexts, typically in terms of which priorities explain types of behavior such as empathy (Myrsky and Helkama, 2001), moral sensitivity (Myrsky and Helkama, 2002) or some kind of environmental concern: this is discussed in more detail below. Among humans these values influence attitudes or behavior in new situations.

There is evidence that age affects value priorities: as one gets older self-transcendence increases and self-enhancement decreases, whereas openness to change decreases and conservation increases (Schwartz, 2006). As for gender, men score more highly on power, stimulation, hedonism, achievement, and self-direction, and females on benevolence and universalism (Schwartz and Rubel, 2005).

As mentioned above, Myrsky and Helkama (2001) and Verkasalo et al., 1994) compared students of business, technology and the social sciences in Finland – although the business-student samples were rather small (46 and 128). The results of both studies related to business students were fairly similar: these students achieved higher scores on power and achievement than the social-science students, and lower scores on universalism. There were only minor differences between the technology and the business students.

## 2.2. Attitudes towards sustainable development

Attitudes are less lasting than value priorities and they have an object, here sustainable development. Unlike in the case of value priorities, there is no widely accepted scale for measuring people's attitudes towards sustainability - numerous scales have been developed with various specific focuses. Stone et al. (1995), for example, developed a 26-item scale to measure environmentally responsible consumers. Haws et al. (2014) put forward a six-item Green scale to measure "...green consumption values as the tendency to express the value of environmental protection through one's purchases and consumption behaviors". Balderjahn et al. (2013a) define sustainable consumption as when "consumers act in an environmentally and socially responsible manner". They validated a scale measuring consciousness of sustainable consumption on three dimensions: environmental, social and economic. Their final scale (Balderjahn et al., 2013b) consists of 18 items.

Some scales measure environmental concern based – at least partially – on the New Environmental Paradigm (NEP) scale (Dunlap and Van Liere, 1978), as well as on its various revisions (e.g. Schultz et al., 2005; Casey and Scott, 2006): this often means that the phenomenon is represented by three factors rather than one. The

<sup>2</sup> The questions related to power were: 1) It is important to him to be rich. He wants to have a lot of money and expensive things. 2) Being very successful is important to him. He hopes people will recognize his achievements.

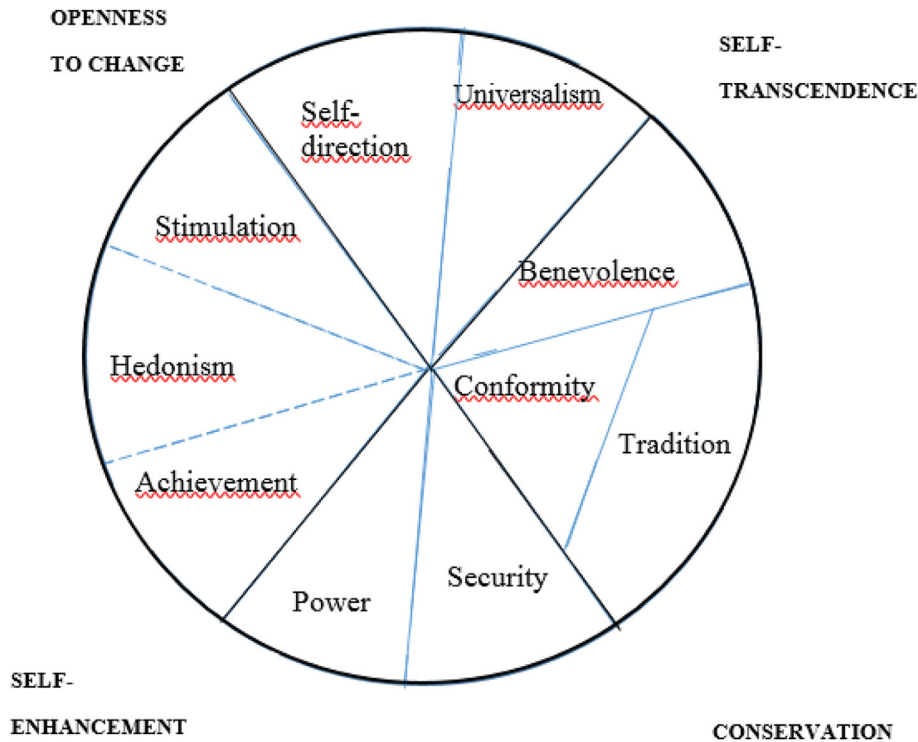


Fig. 1. The structure of value evaluations organized according to motivational similarities and dissimilarities (Schwartz, 1992).

environmental-attitudes inventory (Milfont and Duckit, 2010), in turn, has twelve different facets, each with ten questions on environmental attitudes. In addition, various scales have been developed for targeted purposes such as the scale with ten questions discussed by Whitmarsh (2011) that was used by Lambrechts et al. (2018) for business students.

The scale employed in this study is used by TNS Kantar Finland, which is the only one that allows the comparison with a nationwide sample. It comprises a set of five questions related to the respondent's attitudes as a consumer making choices.

### 2.3. Attitudes towards sustainable development and value priorities

Looking at a person's value priorities and attitudes simultaneously one sees which are the values that determine and motivate specific attitudes, in our case toward sustainable development. Values are especially important in new situations that require new attitude-formation. Thøgersen and Ölander (2002) studied the causality between value priorities and the emergence of the sustainable-consumption pattern. They write: "... the predominant causal influence between basic values and environmentally friendly behavior indeed goes from values to behavior at least in a short to medium term perspective." Thus to make a difference and influence behavior related to sustainability requires changes in value priorities – at least in the short to medium term.

Some studies (Karp, 1996; Schultz et al., 2005; Thøgersen and Ölander, 2002; Schultz and Zelezny, 1999) measure the relationship between value priorities and sustainable-development (or environmental) attitudes. Findings imply that it is primarily universalism that is positively related to attitudes towards sustainability and – in line with Schwartz's theory – that power and achievement are negatively related. These results are in line with Schwartz' theory, and it is quite obvious that universalism correlates positively in that it reflects concern for the welfare of people and for nature. Hence the self-enhancement – self-transcendence

axis plays a major role (Karp, 1996; Schultz, 2005; Thøgersen and Ölander, 2002). According to Schultz and Zelezny (1999), tradition is negatively, and conformity is positively related to attitudes towards sustainability. We study the relationship in a new group comprising business students.

## 3. Methods

### 3.1. Measurement scales

Two instruments have been developed to measure value priorities: Schwartz' Value Survey (SVS) and the Portrait Value Questionnaire (PVQ) (see e.g., Schwartz, 2012). The former comprises 57 questions, whereas the PVQ consists of short verbal portraits of 40 different people describing a person's goals, aspirations, or wishes that point implicitly to the importance of a value. For example, for one person: "Thinking up new ideas and being creative is important to him/her. He/she likes to do things in his/her own original way"; for another "It is important for him to get respect from others, he wants people to do what he says". The respondents are asked, with regard to each portrait: "How much like you is this person?" The responses are given on a six-point scale: very much like me, like me, somewhat like me, a little like me, not like me, and not like me at all. We used a shorter version of the PVQ with 21 questions, which was developed by Schwartz (2003) for the purposes of the European Social Survey (ESS; The European Social Survey). Each value is represented two or three times among the 21 questions. The responses to the relevant questions are averaged and the average across all 21 item responses is deduced for scaling purposes.

When we started the study the goal was to compare the sample of business students (BIZ) and a nationwide comparative sample. We were also mindful of the requirement to weight observations with respect to age and gender, filtered to include people with a similar educational level to those in the BIZ sample. The only

**Table 1**

A comparison of the mean scores for value priorities across the BIZ and the nationwide samples.

Value priority	BIZ sample		Nationwide sample		t (784)	p
	Mean	StdDev	Mean	StdDev		
Conformism	-0.74	1.01	-0.31	0.89	5.32	<0.0001
Tradition	-0.85	0.89	-0.54	0.9	4.14	<0.0001
Benevolence	0.7	0.53	0.81	0.58	2.24	0.026
Universalism	0.42	0.64	0.71	0.68	5.18	<0.0001
Self-direction	0.47	0.74	0.42	0.7	0.81	0.419
Stimulation	0.21	0.87	-0.18	1	5.18	<0.0001
Hedonism	0.41	0.81	0.15	0.81	3.81	<0.0004
Achievement	-0.01	0.82	-0.41	0.89	5.34	<0.0001
Power	-0.55	0.83	-1.07	0.85	7.3	<0.0001
Security	-0.26	0.86	0.06	0.77	4.83	<0.0001

available sample meeting the requirements was the one used by TNS Kantar Atlas: their database includes responses to five questions related to attitudes towards sustainable consumption. Most of the BIZ students were young adults with a fairly short history of economic independence, which is why the five relatively general questions with a sustainable-consumption orientation seemed highly suitable. The Atlas statements were measured on a scale ranging from one to five, one referring to "I totally agree" and five to "I totally disagree". TNS Kantar confirmed that, in their representative sample, age and gender affected attitudes towards sustainable development in Finland as follows: females were more concerned about it, and for both genders' concern intensified with age. Moreover, the more highly educated have more positive attitudes towards sustainable development. The TNS Kantar Atlas questions were:

- Atlas 1: I would accept a lower standard of living if it contributed to decreasing environmental pollution.
- Atlas 2: I would happily pay a somewhat higher price for an environmentally friendly product.
- Atlas 3: I am prepared to change my way of life in order to protect the environment.
- Atlas 4: I try and avoid the purchase and use of products that pollute the environment.
- Atlas 5: There is too much fuss about environmental topics.

In the sequel we refer to these questions as attitudes towards sustainability.

The use of these two scales, value priorities and attitudes towards sustainable development, enabled us to compare the BIZ results with two comparable samples on the country level. Note, however, that one country-level sample contained information on value priorities and the other on attitudes towards sustainable development.

### 3.2. Samples

Data gathering for the student sample started in 2012 when we sent a request to a representative sample of business students promising a restricted number of cinema tickets for the quickest respondents. The link was still kept open after the 70 tickets had been allocated. The final sample of 87 was skewed towards young students. The authors collected additional data from Finnish participants during a Master's program course, which produced a further 98 responses. The BIZ sample therefore comprised a total of 185 respondents. The age-gender distribution of the sample and the true distribution used for weighting are presented in Appendix A. The means of the value priorities as

well as the ratings on the sustainable-development question were compared across the original sample of 87 and the subsequent sample of 98 respondents. The only differences were in security and stimulation, values that are not expected to correlate with sustainability attitudes. We therefore continued with the combined sample.

The country-level data thus consisted of the following two samples, one from the ESS and the other from TNS Kantar: both were filtered with respect to education to include only respondents with a Finnish high-school diploma or a university degree.

- 601 respondents from the European Social Survey (ESS),<sup>3</sup> a large representative sample of EU citizens that includes value-priority measurements
- 7321 respondents from the Atlas survey of TNS Kantar, a leading market research agency. Atlas includes questions related to sustainable development.

## 4. Results

This section reports the results of the analyses. First we assessed the relationship between values and attitudes towards sustainability in the BIZ sample to see if there were any differences from findings published in earlier studies. Then we compared the value priorities and attitudes of the BIZ sample with those in the country-level samples. Appendix A gives information about the samples and population and Appendix B summarizes the calculations made.

### 4.1. Values and attitudes towards sustainability in the BIZ sample

Earlier research (Karp, 1996; Schultz et al., 2005; Thøgersen and Ölander, 2002; Schultz and Zelezny, 1999) indicates that among the value priorities it is primarily universalism that is positively associated with attitudes towards sustainability, and that power and achievement are negatively associated. Some studies have also reported some other correlations, as mentioned earlier (Schultz and Zelezny, 1999). Cronbach's alpha for the five Atlas questions was 0.775 in the BIZ sample.<sup>4</sup>

We calculated the correlations between the value priorities and the sustainable-development sum variable and found three significant correlations for all  $p < 0.0001$ : achievement (negative), power (negative) and universalism (positive). As discussed above, the results are in line with earlier research findings on the topic using various measures of attitudes towards sustainable development. Thus, again it was the self-enhancement-transcendence axis that was related to attitudes towards sustainability.

### 4.2. A comparison of value priorities

All the samples compared were weighted to correspond with the gender-age distribution of BIZ students in the same year. We compared the value-priority means of the weighted BIZ and the ESS samples (see Table 1 for the results). A negative figure means that the value priority is below average among the 21 question responses (Computing Scores for, n.d.). Note that the priorities are scaled such that a high value means high priority.

Those in the BIZ sample achieved higher scores on power and achievement (self-enhancement axis) and lower scores on universalism and benevolence (self-transcendence axis), as well as higher

<sup>3</sup> EU member countries produced a measurement on this scale using a representative sample of their citizens in the European Social Survey (ESS, <http://www.europeansocialsurvey.org/search?q=schwartz>).

<sup>4</sup> The Atlas sample did not allow that calculation.

scores on hedonism and stimulation (openness to change axis) and lower scores on conformism, tradition and security (conservation axis). These results correspond with previous measurements (Myrsky and Helkama, 2001; Verkasalo et al., 1994). Recall that in previous studies the self-transcendence axis was typically found to be positively correlated with attitudes towards sustainability and the self-enhancement axis negatively.

#### 4.3. A comparison of attitudes

We calculated the age-gender-weighted frequencies of the five Atlas questions, filtering the TNS Kantar respondents according to education (keeping those with a high-school diploma and/or a university degree). Only summaries of those frequencies were available, which is why no Cronbach's alphas can be calculated and the questions are dealt with separately.

The average responses to the five questions were compared across the BIZ and the TNS Kantar samples (Table 2). The figures are scaled such that a high score means a positive attitude towards sustainable development. On all the five questions the average attitude score in the BIZ sample was higher and the difference was statistically significant related to two questions: "I would happily pay a somewhat higher price for an environmentally friendly product" and "I am prepared to change my way of life in order to protect the environment".

We also assessed the similarity of the distributions of responses in the five questions across the two samples using the Mann-Whitney test, which produced the same results as the test of averages indicating that the distributions of the two questions mentioned above differed significantly (for both  $p < 0.0001$ ).

## 5. Discussion

We now return to our results and discuss first the value priorities. All ten value priorities except self-direction differed across the samples of business students and the country-level ESS sample. In sum, the business students achieved higher scores on self-enhancement and openness to change, and lower scores on self-transcendence and conservation: these results are in line with findings from earlier research (Myrsky and Helkama, 2001; Verkasalo et al., 1994). The values that correlated most strongly with attitudes towards sustainability, both in the BIZ sample and in previous research, were universalism (positively) and power (negatively), indicating that attitudes towards sustainability could be less favorable in the BIZ sample than in the comparative country-level sample. However, the BIZ sample produced equally high or even higher scores compared to the country-level sample, indicating equally or more favorable attitudes towards sustainable development. This could be attributable to the ongoing university education that raises sustainability

issues and may well have positively affected attitudes, thus raising the level throughout the sample. However, there is no hard evidence of this.

Using student panel data from Finland, Myrsky et al. (2013) studied changes in value priorities over a three-year period and discovered that education led to an increase in the perceived importance of universalism and security and a downward trend in achievement. These results are in line with findings reported by Pascarella and Terenzini (1991). Thus, fairly recent studies have shown that though values are thought in general to be long-lasting they may change even in a relatively short period of time, during education for instance. Myrsky et al. (2013) point out that the values of future professionals are influenced during that time via formal (training, supervision) or informal (transmitting values and norms) channels. Note that the decision to compare the business-student findings with the country-level data led to some compromises. The country-level data on value priorities and on attitudes came from different sources, which meant that it was not possible to study the relationship between them. Moreover, the BIZ sample size was small, although it was larger than in earlier studies. When we compared the means of the value-priority attitudes we weighted all the samples to improve the reliability of the comparison. As for validity concerns the scales used in this study have long histories. The Schwartz scale has been very widely used, and TNS Kantar has been using the attitude-towards-sustainability scale for a long time.

There is a wide spectrum of literature dealing with how to achieve desired learning outcomes for sustainable development taking both a theoretical perspective and also a more practical approach (e.g. reviews by Figueiro and Raufflet (2015) as well as Sahakian and Seyfang, 2018; Adomssent et al., 2014; Bradley, 2019; Brunstein and King, 2018). Many studies emphasize the need for something more than knowledge enhancement. Shrivastava (2017) calls this a "pedagogy for passion", meaning a holistic approach to integrate students' physical, emotional and cognitive learning. Collins and Kearins (2010) took their students to live in an eco-village. Sapos et al. (2008) wished to engage the "head, hands and heart" in learning and Sidiropoulos (2014) points out the role of value priorities in adopting sustainability views. Education thus can take many forms in terms of influencing attitudes and actions, and it can take place on several levels.

Based on Sterling (2011) change in sustainability education can be executed on three levels, ranging from a weak to a strong view of sustainability. His work is based on Bateson's (1972), cited in Sterling (2011) three orders of learning and change. First-order change refers to "more of the same", in other words change within a special area without questioning the assumptions or beliefs of the learner – the aim is to "do things better" and improve existing systems. According to Sterling (2011), most teaching in higher

**Table 2**  
A comparison of the average attitudes towards sustainability across the BIZ and the TNS Kantar samples (scale 1–5 from strongly disagree to strongly agree).

Value	BIZ sample		Nationwide sample		t (740)	P
	Average	StdDev	Average	StdDev		
Priority						
<b>Atlas 1:</b> I would accept a lower standard of living if it contributed to decreasing environmental pollution.	3.22	1.08	3.15	1.16	0.72	not sig.
<b>Atlas 2:</b> I would happily pay a somewhat higher price for an environmentally friendly product.	3.77	0.99	3.21	1.15	6.00	<0.0001
<b>Atlas 3:</b> I am prepared to change my way of life in order to protect the environment.	3.67	0.94	3.35	1.06	3.70	<0.0001
<b>Atlas 4:</b> I try and avoid the purchase and use of products that pollute the environment.	3.33	1.07	3.32	1.05	0.07	not sig.
<b>Atlas 5:</b> There is too much fuss about environmental topics. (scale reversed)	3.94	0.96	3.81	1.09	1.50	not sig.

education based on transmissive pedagogies represents this level, the aim being to transfer knowledge rather than to challenge paradigms or students' beliefs. The second-order change, or level 2 of learning also recognizes other than the dominant paradigm and aims at "doing better things". Learners are already required to review their values critically and possibly even to change them. This is a challenge for the student, who has to consider all information, including what has previously been learned, from a critical perspective. The goal on the first-order level is to increase efficiency, whereas on the second-order level it is to find out what purposes the increased efficiency serves. The learning on this latter level is transformative. The third level is even more challenging: Sterling (2011) describes it as "seeing things differently" and it involves a paradigm change.

Our results could indicate that at least some first-level learning has taken place, but it is obvious that much more progress is called for. Given that value priorities drive attitudes, there is a need for an increase in the Schwartz value of universalism and decrease in power. Sidiropoulos (2014) promotes "a learning approach based on reflection and critical thinking, consensus building and partnerships, and building the learner's ability for action and change." This seems to refer to second-level learning, and as an approach comes close to the socio-cognitive-conflict method commonly applied in the social sciences. It is one way of affecting values, and has achieved some favorable results in terms of learning. When a conflict emerges, community members present different views on a matter in which they share a mutual interest. The conflict requires solutions to serve a learning purpose. When individuals discuss their views their information structures adapt to the context. They are expected to evaluate and justify their views. (Mogonea and Popescu, 2015; Buchs et al., 2010). Teaching in business schools that relates to negotiation processes (Raiffa et al., 2002), for example, shares features of this method.

Business and management educational institutions globally have widely accepted United Nations principles for responsible management education (PRME) that among other things means regular reporting of the efforts made. Business schools should rigorously and regularly assess their teaching goals which could reflect Sterling (2011) three-level framework of sustainability education – short-term and long-term aims as well as the state of the art. Some authors like (Gatti et al., 2019; Sidiropoulos, 2018) have measured the effect the courses have had on the students. We would encourage educational units to measure systematically how value priorities and attitudes towards sustainability evolve during the course of students' studies considering also the possible trends in the freshmen's initial levels. This would give a more realistic picture of the potential effects and challenges of education. There is also a need for a deeper understanding of how learning occurs over time on both the program and the course level to facilitate comparison of the effectiveness of different teaching approaches.

Sustainability requirements and smart choices are present in the lives of most consumers nowadays. Companies are also under pressure to profile themselves as committed to sustainability and to ethical principles in general. It has been shown in recent studies that the main value priorities correlating with favorable attitudes towards sustainability are universalism (positively) and power (negatively). Universalism implies concern for other people and for nature and power is the value on the opposite side of the circle of values. Sustainability objectives are becoming more and more mainstream: individuals and businesses are both conscious of them and it is only a question of the pace at which they are adopted. Results such as reported by the International Panel on Climate Change in fall 2018 indicating how scarce the time remaining to make a change is was one further alarm. It

would therefore be interesting in future studies to see how the relationship of value priorities and attitudes towards sustainability will evolve.

## 6. Conclusions

This study extended the previous literature on value priorities and sustainable development by studying them simultaneously among business students, future managers. Apparently for the first time the results were compared with nationwide data.

The knowledge generated in this analysis could be seen as a serious response to the growing need to include sustainability in university curricula - the importance of knowing about students' values and attitudes needs to be emphasized so that instructors can smartly direct and customize their teaching. The goals of education should be reviewed continuously in accordance with the results of regular assessments of student values and attitudes.

The merits of this study reside on the empirical side – we were able to bring new results related to our research questions related to the value priorities and attitudes towards sustainability comparing a sample of business students and comparable nationwide samples. The theoretical contributions are related to introducing the Sterling's three levels of sustainability education based on the work of Bateson (1972) and suggesting that the involvement of students' values and sustainability attitudes should be reflected against those levels (or a corresponding categorization), i.e. to be reviewed in the same realm.

Recent studies have shown that values can change even in the normally short period of time students are in education. This provides opportunities for and imposes responsibilities on universities and their teaching.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## CRedit authorship contribution statement

**A. Bask:** Conceptualization, Investigation, Writing - review & editing, Funding acquisition. **M. Halme:** Conceptualization, Investigation, Methodology, Formal analysis, Writing - original draft, Project administration, Funding acquisition. **M. Kallio:** Conceptualization, Writing - review & editing, Funding acquisition. **M. Kuula:** Conceptualization, Writing - review & editing, Funding acquisition.

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## Appendix A



BIZ student frequencies in fall 2012			
age	male	female	total
15–23	229	196	425
24–26	544	470	1014
27–29	571	458	1029
30–49	760	544	1304
50-	71	55	126
total	2175	1723	3898

BIZ sample 2012			
Age	male	female	total
15–23	29	43	72
24–26	48	24	72
27–29	9	10	19
30–49	7	13	20
50-	1	1	2
Total	94	91	185

TNS Kantar respondents in 2012			
Age	Male	female	total
15–23	158	421	579
24–26	80	245	325
27–29	107	307	414
30–49	871	1843	2714
50-	1557	1732	3289
total	2773	4548	7321

## Appendix B. How the results were calculated

### Value priorities

The procedure is described in detail in Computing Scores for the 10 human values (n.d.). The responses are given on a six-point scale. Computing one respondent's value priorities first the average across all given response scores is calculated, we denote that by A. The final score for each value is calculated as an average of the responses to questions related to each value. Then A is deduced from all the value scores.

### Attitudes towards sustainable development

The responses are given on a scale from one to five.

### Weighing

The gender-age structure of the samples is naturally not the same as that of the population (the BIZ students in 2012). The weighing for each gender-age category is carried out using post-stratification (Statistics for Sociology, 2017). If the proportion of a certain gender-age category in the sample is, say 20% and in the population it is 30% then the weight for that category is 1.5.

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