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Using the Theory of Planned Behavior to Investigate the Determinants of Environmental Behavior among Youth

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Previous studies have pointed out the importance to investigate the determinants of environmental knowledge, attitudes, and behavior among youth. In the present article, the Theory of Planned Behavior is used to examine the gap between the environmental attitudes and the actual behavior of young people. A survey was conducted online among the respondents aged 17-36 (in total 459). The results of this study showed the relationship between the respondents' behavior and intentions which was twice as strong as the relationship between their behavior and attitudes ($r=0.4$ and 0.21, $p<0.05$). The analysis of data also revealed that social pressure had less impact on youth's behavioral intentions in comparison to perceived behavioral control ($r=0.22$ and 0.36, $p<0.001$).

Keywords: *the Theory of Planned Behavior, conservation behavior, pro-environmental attitudes, environmental intentions.*

1. Introduction

A detailed research was conducted by Wray-Lake et al (2008), who examined trends in youth's environmental attitudes, beliefs, and behaviors across three decades. The authors argue that the environmental views of young people have high social relevance and thus deserve special attention. Moreover, during the youth period individuals are most open to socialization influences and their values and worldviews undergo significant formation (as cited in Alwin & McCammon 2003). Therefore, identities formed during this time are likely to inform values, attitudes, and behaviors throughout life (Alwin & McCammon 2003; Flanagan 2004; Jennings 1989; Smith 1999).

1.1. Environmental behavior

According to Juraitė (2002), environmental behavior refers to a socially-conscious behavior which is based on social responsibility and involves individual and social aims that a person wants to achieve by behaving in a particular way. Environmentally friendly behavior can be rather complex due to several actions / stages / levels that it comprises (Barr 2007).

In order to explain a specific human behavior, one should consider a Theory of Planned Behavior, which was first presented back in 1985 (Ajzen 1991). This theory extended a Theory of Reasoned Action (TRA) with the variable of Perceived Behavioral Control (PBC). The characteristic feature of both theories is behavioral intentions which are identified as the main element to predict the actual behavior. Behavioral intention can be described as an indication of individual's readiness to perform a given behavior. In their research Ajzen et al. (2009) found strong correlations between behavioral intentions and the actual behavior ($r=0.96$, $p<0.001$) admitting that, on average, 27 % of the variance in behavior was explained by behavioral intentions.

The Theory of Reasoned Action, which is the base of Theory of Planned Behavior, distinguishes two determinants that predict behavioral intentions: personal attitudes towards behavior and subjective norm. The first determinant refers to positive or negative evaluation of a particular behavior which is formed by our behavioral beliefs. For example, if a person believes that by buying certified organic goods he or she contributes to the reduction of

environmental pollution and conservation of natural resources, then it can be stated that personal attitudes towards the performed behavior are positive. Respectively, if a person is convinced that eco-labels are nothing more but a marketing trick, his or her attitudes towards buying these goods will be negative. Moreover, Ajzen and Fishbein (2005) note that attitudes make the greatest impact on human behavior only when there are favorable conditions. That is, being influenced by attitudes, certain behavior may sometimes not be performed due to individual characteristics of a person. Still, attitudes give stimulus for behavior to emerge: influenced by personal, social or informational factors, they help evaluate behavior in a positive or negative way, surrender to or resist social pressure, behave in one way or another. Moreover, as indicated by Ajzen and Fishbein (2005), the same factors also make an impact on person's perceptions whether he or she is able to perform behavior or keep it suppressed. Thus, personal, social of informational factors have a direct influence on behavioral intentions that help to predict behavior.

The second determinant of the Theory of Reasoned Action is subjective norm, which reflects person's perception of social pressure regarding the performance of behavior. From the point of environment protection, subjective norm can be viewed as beliefs whether planned conservation behavior has to be implemented or not. To illustrate, green lifestyle, which is becoming even more fashionable and socially desirable these days, forms beliefs about sustainable consumption (Trad 2008 as cited in Riethmuller and Buttriss 2008) that can influence not only behavioral intentions (Kaizer, Gutscher 2003; Kaizer, Scheuthle 2003), but also behavior itself (Valle et al. 2005).

Apart from attitudes towards behavior and subjective norm, the Theory of Planned Behavior is extended by adding another determinant – Perceived Behavioral Control (PBC), which refers to person's perception of ease or difficulty to perform behavior (Ajzen 1991). Perceived Behavioral Control affects both behavioral intentions and behavior itself. In terms of environmental behavior, PBC explains how person perceives his ability to perform such behavior, which depends not only on his attitudes and societal constraints, but also on personal beliefs about contributing to environmental problem solving. For instance, it is more likely that people will behave more environmentally friendly if they understand their personal impact on the environment (Birgelen et al. 2009). Respectively, if someone perceives conservation behavior as too complicated (i.e. recycling), it is less likely that such behavior will be performed.

1.2. Pro-environmental attitudes

The New Ecological Paradigm, which was first constructed in 1978 and then revised in 2000 by sociologists Dunlap and Van Liere, marks a change from the anthropocentric view of the world towards the ecological worldview. The anthropocentric view, which regards human beings as unique and most significant species who created culture and have dominance over nature, is replaced by nature-centered system of values, where human beings are viewed as rational animals whose activity should be based on nature conservation and environmental sustainability.

At first, Dunlap and Van Liere distinguished three facets of an ecological worldview: the reality of limits of growth, the fragility of nature's balance and anti-anthropocentrism. Later, another two were added: rejection of exemptionalism and the possibility of an eco-crisis. In total, the New Ecological Paradigm Scale includes 15 items, three for each facet. Eight items are presented in such a way that agreement with them will indicate a pro-ecological view, and the other seven items are worded so that disagreement will indicate a pro-ecological worldview (Henning et al, 2004). The practical significance of such system implies an opportunity to use it for modelling different scenarios of environmental views as well as interpreting reflective ecological experiences of today's society. For example, the facet of the reality of limits of growth is used to determine public beliefs whether the number of population that the planet Earth can hold is reaching its limits. It is very plausible that supporters of such view are very sensitive when it comes to alarmists' warnings about the growth of population and diminishing natural resources.

The fragility of nature's balance implies that humans are severely abusing the environment. Since they are responsible for upsetting the balance of nature, which is very delicate, a fear is also present that they will have to pay for it. This situation is often called the boomerang effect or the law of Barry Commoner which indicates that "There Is No Such Thing as Free Lunch". As a result, an opinion has been formed stating that environmental problems should be characterized not only by the increasing human impact on the environment, but also by the impact of human-altered environment on social development.

The content of anti-anthropocentrism can sometimes be compared to the ecological view, as both of them regard the right of existence of plants and animals and oppose the idea that nature exists primarily for human use who have the right to modify it to suit their needs (Erdogan 2009). Such worldview is especially common among the most radical back-to-nature movements. Still, it should be noted that eco-centrism is typical of all five facets of the ecological worldview, although anti-anthropocentrism is considered to be the most radical one.

In comparison to anti-anthropocentrism, a less radical facet of ecological worldview is rejection of exemptionalism. Here the emphasis is put on the fact that despite their special abilities, humans are still subject to the laws of nature (Erdogan 2009). Even though humans are capable of changing the

environment and altering the eco-systems, in order to survive, they use natural resources and depend on them. That is, human ingenuity does not allow becoming independent of nature.

The system of ecological worldviews made it possible to examine human-nature relations more closely. Moreover, the New Ecological Paradigm Scale, which was designed to measure pro-environmental orientation, enabled specialists to quantifiably assess human concerns about the environmental problems, as well as to relate their environmental values and attitudes to conservation behavior. The facets of ecological worldviews have also become an indicator to display different aspects of environmentally friendly behavior. For this reason, The New Ecological Paradigm has become a widely used tool among the scientists in their research studies (Stern et al. 1999; Meinhold and Malkus 2005; Valle et al. 2005; Aldrich et al. 2005; Schultz et al. 2005; Ignatow 2006; Vikan et al. 2007; Brauchle et al. 2007; Lopez and Cuervo-Arango 2008; Groot and Steg 2008; Erdogan 2009; Edgerton et al. 2009; Nisbet et al. 2009).

1.3. Environmental knowledge

Statements which indicate that unfriendly behavior towards the environment can be changed by providing people with environmental knowledge have been confirmed partially. The results of previous researches have pointed out that variance in behavior was explained by environmental knowledge only from 6% (Kaiser et al. 2004) to 8% (Hwang 2000). On the other hand, Malkus and Meinhold (2005) research carried out among the teenagers has shown that environmental knowledge can be a significant determinant to explain the relational differences between the conservation behavior and the environmental attitudes. The results have indicated that the relationship between the eco-friendly attitudes and behavior is far stronger among those teenagers that possessed more environmental knowledge in comparison to those who had less knowledge about it, respectively, $r=0.58$ and $r=0.31$ ($p<0.001$). Such relationship was more common among male teenagers, $r=0.61$ and $r=0.40$ ($p<0.001$). However, controversial data do not allow answering unquestionably what impact (direct or indirect) environmental knowledge has on conservation behavior. Moreover, discussions still occur whether environmental attitudes and eco-awareness are higher among those who have more knowledge about the ecological problems and their solutions.

Kaiser et al. (2004) note that to-date most of research studies on environmental knowledge have examined only one or, at most, two forms of environmental knowledge and, thus, do not present a comprehensive analysis of the relative effects of different knowledge on behavior. Having found that most of the time only general knowledge had been considered, Keizer et al. identified three forms of knowledge to understand the ways in which they work together in promoting conservation behavior. These are the following:

1. System knowledge;
2. Behavior-related knowledge;
3. Effectiveness knowledge.

The differences among these forms of knowledge are essential. System knowledge is usually associated with knowledge about the ecosystems as well as the processes within them, and can be attributed to the basic level of environmental knowledge. Action-related knowledge is defined as knowing what to do about the environmental problems and, thus, is related to a higher level of knowledge. The highest level of environmental knowledge, which is knowledge about the benefit (effectiveness) of environmentally responsible actions, is when people have to choose from a series of possible actions to get the greatest environmental benefit. To illustrate, before starting to recycle at home, a person should have some understanding about the material streams, to “know that” nature is a zero waste cyclical system, while people dispose of waste which end up in landfills. Moreover, a person should “know what” can be done in order to overcome the problem (i.e. to recycle properly, avoid waste formation, change consumption habits, etc.). Finally, one has to “know how” to behave in the most effective way towards the environment, which, to put it simply, is the avoidance of waste formation.

Kaiser et al. studies (2002, 2004) revealed that action-related knowledge had more impact on conservation behavior than effectiveness knowledge, respectively, $r=0.18$ and $r=0.12$ ($p<0.001$). Although the correlation coefficients are significant, they are quite weak; the correlations of different types of knowledge and conservation behavior are very little, whereas correlation of system knowledge and environmentally friendly behavior was not found at all $r=0.00$ ($p>0.05$).

2. Formation of questionnaire and methodology

The first part of the questionnaire consisted of questions aimed at gathering sociodemographic and socioeconomic data about the respondents (age, gender, education, field of education, income, religious beliefs, etc.). The second part was comprised of questions to determine participant’s environmental attitudes by the use of the New Ecological Paradigm Scale (Dunlap et al. 2000). In this part of the questionnaire respondents were asked to specify their level of agreement or disagreement with a series of statements using a Likert scale. In the third and the fourth parts, questions were provided to examine respondents’ environmentally friendly behavioral intentions and their actual performance of behavior. Intentions were evaluated by indicating the agreement or disagreement with given statements (e.g. “I intend to recycle at home or continue recycling”), whereas the actual conservation behavior was assessed by

responding to questions about the frequency of behavior in a 4-point rating scale from "never" to "always". The fifth part of the questionnaire consisted of questions to ascertain respondents' environmentally friendly behavioral intentions and the determinants of actual behavior: social pressure and perceived behavioral control. Social pressure was assessed using a 5-point Likert Scale ("I am expected to contribute to reducing climate change"), whereas perceived behavioral control was examined by respondents' agreement or disagreement with the given questionnaire items ("I (do not) find it difficult to change my consumption habits"). The last part of the questionnaire was provided in a form of 14 multiple choice questions to gather information about the respondents' environmental knowledge in general. The questions were adapted from the research conducted by Keizer et al. (2004) which aimed at investigating the environmental knowledge.

In total, 459 people aged 17-36 took part in an online survey. 66.9% of the respondents were women and 33.1% men. More than a half (58.4%) of the respondents held a degree, among whom 23.7% were graduates from Natural Sciences, 19.6% - Human Sciences, 13.7% - Technological Sciences, 31.6 % Social Science, and 7 % Arts studies.

The rest of the respondents (41.6%) had secondary or lower education. 30.3% of them indicated to be religious (85.6% of them referred to themselves as Roman Catholics or members of other Christian communities), 50.1% stated their belief in god without being religious practitioners, whereas 19.6% of the respondents consisted of atheists/nonbelievers.

Having estimated the internal consistency reliability of all scales using a Cronbach alpha coefficient (Table 1), it has been found that all the scales, except for one, that was used to assess the respondents' environmental knowledge, reflect the tested values and can be used in statistical analysis. Since the dispersion sum of individual questions, which were provided to evaluate respondents' environmental knowledge, was approximate to the dispersion of the whole scale, i.e. questions did not intercorrelate, the scale was eliminated from the subsequent analysis.

Table 1.

Scale	*Cronbach alfa*
Pro-environmental attitudes	0.73
Environmentally responsible behavior	0.73
Behavioral Intentions	0.75
Perceived Behavioral Control	0.50
Social pressure to behave in an environmentally responsible manner	0.92
Environmental knowledge	0.32

Interval data were converted into ordinal, and chi-square criterion was used, whereas correlations of variables were measured using Spearman rho correlation coefficient. Calculated r value of positive and negative correlation coefficients was interpreted in the following categories: strong, high correlation $r \geq 0.70$, moderate correlation $0.40 \leq r \leq 0.69$, weak, low correlation $r \leq 0.39$ (Kardelis 2007).

3. Results

The correlation coefficients (Table 2) between environmental attitudes and behavioral intentions as well as between environmental attitudes and conservation behavior were very similar. It was estimated that environmentally friendly attitudes affect both behavioral intentions and the actual behavior, though, in both cases, the statistically significant relationship is weak.

*Table 2. Spearman's Correlation matrix, p<0.001; *p<0.05*

	1	2	3	4	5	6	7
Attitudes	1	0.21	0.25*		0.14	0.18	0.1*
Behavior		1	0.4	0,2	0.29	0.15*	0.09*
BI			1	0.22	0.36	0.16*	0.15*
SP				1	0.11*		0.14*
PCB					1		
Gender						1	0.16
Religion							1

Correlations of behavioral intentions and actual behavior (r=0.4, p<0.001) as well as correlations between PBC and the behavioral intentions (r=0.36, p<0.001) were found the highest. Respondents' gender, income, education and religious beliefs did not make a considerable impact on their environmental attitudes, behavioral intentions, actual behavior, etc. In all cases, the correlation coefficients were either lower than 0.2, or non-statistically reliable relationship was found (p>0.05).

Respondents with more expressed environmental attitudes indicated to behave environmentally friendly in the future (or continue in the same manner, if such behavior was already present) twice as often as the respondents with less expressed environmental attitudes, respectively, 58.9% and 32.2% (Figure 1).

Similarly, the respondents who had stronger environmental attitudes tended to behave more environmentally friendly (61.2% in contrast to 40.5%) (Figure 1). It was also found that conservation behavior was more related to behavioral intentions than environmental attitudes, (r=0.40; p<0.001). Declared intentions to behave more environmentally friendly corresponded to the actual behavior of the four fifths (79%) of the respondents, whereas the rest of the respondents (21%) with intentions to behave more sustainably did not possess the environmentally responsible behavior (Figure 1). This means that respondents having relatively less environmentally friendly intentions were less liable to behave sustainably.

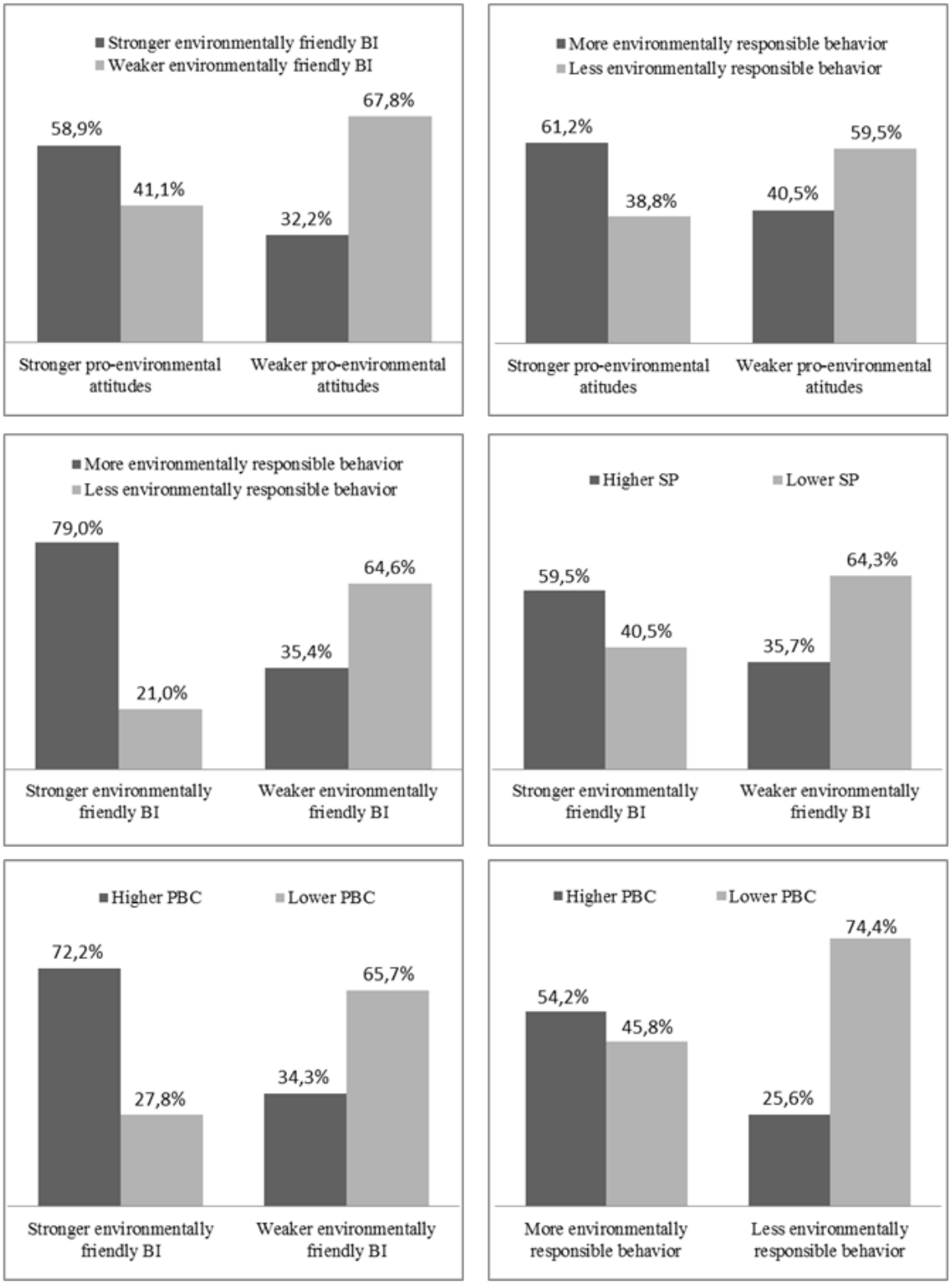

Fig. 1. *Respondents' distribution (%) according to their environmental attitudes, behavioral intentions, actual behavior, social pressure and PBC (Spearman's rank correlation coefficient, $p<0.001$)*

**Environmentally friendly behavioral intention* – an indication of individual's readiness to perform environmentally responsible behavior. ***Environmentally responsible behavior* – an individual's observable response with respect to the environment. It encompasses both individual and social aims that a person wants to achieve by performing particular behavior. ****Pro-environmental attitude* - an individual's positive or negative evaluation of self-performance of behavior towards the environment. *****Social pressure* – external factors that affect individual's beliefs whether particular behavior has to be performed or supressed. ******Perceived Behavioral Control* – the perception of the ease or difficulty of the particular behavior. It is linked to control beliefs about the presence of factors that may facilitate or impede performance of the behavior.

Those respondents who indicated to experience high social pressure to behave more environmentally friendly were inclined to form corresponding behavioral intentions more often (Figure 1). Although the correlation coefficient was weak, the relationship was statistically significant ($r=0.22$, $p<0.001$). Moreover, the relationship got stronger when behavioral intentions were concretized, i.e. correlation between social pressure to recycle at home and the corresponding behavioral intentions was 0.31 ($p<0.001$).

The highest social pressure to behave in a particular way was received from family and friends. Family 53.8 % and friends 41.4 % were identified as the most influential actors to determine participants' behavior. Laws, educational institutions and media were specified respectively by 27.7 %, 27 % and 18.5 % of the respondents. The determinants of social pressure that influenced respondents' behavior and behavioral intentions least frequently were non-governmental organizations 10 %, the example of famous people 7.2% and colleagues 5.2 %.

Stronger pro-environmental attitudes were more common among women (57 %) than men (37.5 %). The correlation coefficient was significant ($p<0.001$), but too weak ($r=0.18$) to draw conclusions about the existing relationship between gender and behavior.

The results showed that conservation behavior was formed by behavioral intentions, whereas environmental attitudes were only one of the factors to influence the intentions (Figure 2.).

Apart from the environmental attitudes, social pressure and perceived behavioral control had a significant impact on the respondents (respectively, $r=0.22$, $p<0.001$ and $r=0.36$, $p<0.001$). 64.3% of the respondents had no intentions to behave environmentally friendly because of relatively low social pressure they received. Respondents who perceived conservation behavior as simple and uncomplicated expressed their intentions of environmentally friendly behavior twice as often as those who perceived such behavior as complicated

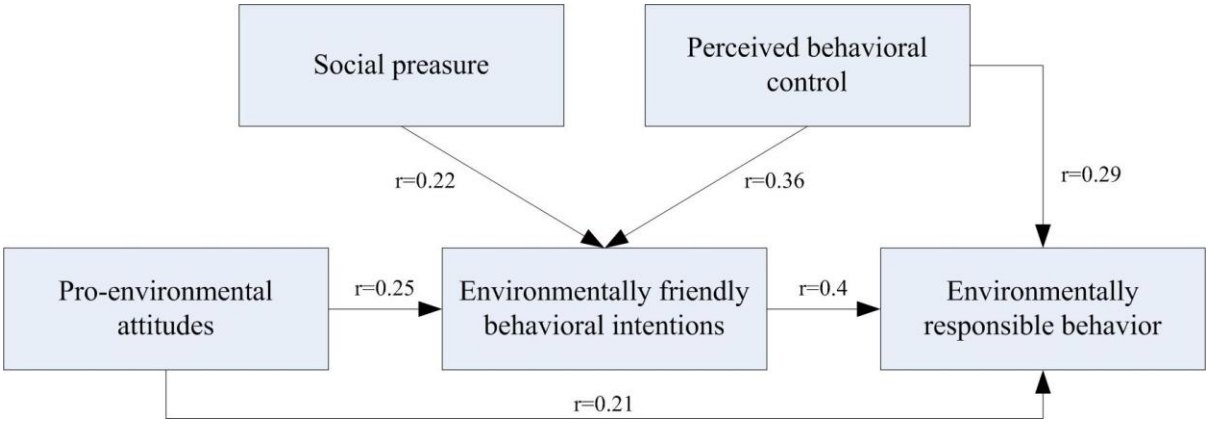

Fig. 2. *The relationship of environmentally friendly behavioral intentions and their determinants to the environmental attitudes and the actual behavior (Spearman's rank correlation coefficient, *p<0.05; **p<0.001)*

Due to the fact that the dispersion sum of individual questions presented to evaluate respondents' environmental knowledge was approximate to the dispersion of the whole scale, i.e. questions did not intercorrelate, the scale was excluded from the subsequent analysis. It was found that the respondents from all fields of education independently of their gender, age, income or other factors were equally wrong while answering the test questions. It could have resulted from the complexity of questions or the respondents' unfavorable attitudes towards the survey on the whole. For this reason, it was impossible to assess the general environmental knowledge. Still, data revealed that the majority of respondents (78%) were certain that the condition of Lithuanian river water was continually getting worse since 1991. Also, 32% of the respondents considered air transport to be more environmentally friendly than rail transport.

4. Conclusions

Having used the Theory of Planned Behavior to investigate the environmental behavior and its determinants among youth, it was found that conservation behavior was first and foremost influenced by behavioral intentions. The results showed that correlations of respondents' behavior and intentions were twice as high as correlations of behavior and attitudes ($r=0.4$ and 0.21, $p<0.05$). Behavioral intentions declared by youth reflected their behavioral differences more often than declared attitudes. Those respondents who expressed their relatively stronger environmental intentions and behaved respectively were twice as many as those whose intentions were less environmentally friendly. Similarly, there were 33.8% more respondents who held relatively stronger environmental attitudes which were reflected in their actual behavior.

The analysis of data revealed that social pressure received from family, friends, etc. had less impact on

youth's behavioral intentions in comparison to perceived behavioral control (r=0.22 and 0.36, p<0.001).

Also, there were 40% more respondents who experienced higher social pressure to behave sustainably and whose behavioral intentions were relatively stronger than that of those who felt lower pressure from their social environment. A similar pattern was detected when environmentally friendly attitudes were analyzed. It was found that there were 45.3% more respondents who held stronger environmentally friendly attitudes that were reflected in their behavioral intentions than those who had weaker environmental attitudes (correlation between attitudes and behavioral intentions (r=0.26). It should be noted that perceived behavioral control affected not only behavioral intentions, but also the actual behavior of youth (r=0.29, p<0.001). There were twice as many respondents (52.5%) who perceived conservation behavior as simple or uncomplicated and had stronger environmental intentions than those who did not intend to behave more environmentally friendly despite a relatively higher perceived behavioral control. Similarly, there were 52.8% more respondents with higher perceived behavioral control and stronger environmentally responsible behavior than that of those who did not exhibit conservation behavior but perceived environmentally friendly behavior as simple and not requiring great efforts.

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(gauta 2012 m. lapkričio mėn., priimta spaudai 2013 m. kovo mėn.)

Straipsnyje, taikant Suplanuoto elgesio teoriją, tiriami veiksniai, darantys įtaką jaunimo nuo 17 iki 36 metų palankiam elgesiui. Tyrimo tikslas – nustatyti ryšį tarp aplinkai palankių nuostatų, ketinimų ir realaus elgesio. Atliktus internetinės apklausos tyrimą, kuriame dalyvavo 459 respondentai, nustatyta, jog ryšys tarp ketinimų elgtis aplinkai palankiu būdu ir realaus respondentų elgesio yra dvigubai didesnis nei tarp aplinkai palankių nuostatų ir atitinkamo jų elgesio ($r=0.4$ ir 0.21, $p<0.05$).Atliekant duomenų analizę, taip pat paaiškėjo, jog respondentų patiriamas socialinis spaudimas būti draugiškesniems aplinkai daro mažesnę įtaką realiam jų elgesiui nei suvokimas apie tokio elgesio sudėtingumą ($r=0.22$ ir 0.36, $p<0.001$).