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1. *NEP has positive influence on reported pro-environmental behavior both in a direct and indirect way.*
2. *NEP influences perceived significance of pro-environmental contributions positively.*
3. *Reported pro-environmental behavior of Americans was negatively affected by false justifications.*
4. *Hungarians' justification of non-behavior does not assist environmentally unfriendly deeds.*

JUSTIFYING ENVIRONMENTALLY SIGNIFICANT BEHAVIOR CHOICES: AN  
AMERICAN-HUNGARIAN CROSS-CULTURAL COMPARISON

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# JUSTIFYING ENVIRONMENTALLY SIGNIFICANT BEHAVIOR CHOICES: AN AMERICAN-HUNGARIAN CROSS-CULTURAL COMPARISON

## *Abstract*

This study examined the function held by justification of environmentally harmful behavior in the relationship between environmental attitudes and environmental behavior. We tested this function in a cross-cultural context hypothesizing culture-dependent relationship between justification and reported behavior. One-hundred American and 100 Hungarian middle class participants responded to the New Environmental Paradigm scale (NEP), the General Ecological Behavior scale (GEB), and self-developed scales for measuring perceived criticality of environmentally significant behaviors and justification for non-behavior. Environmental attitudes and reported pro-environmental behavior were positively correlated irrespective of culture. However, in case of Americans justification appeared to be an organic element of an array beginning with attitudes and ending at behavior, while Hungarians justified non-behavior independently of pro-environmental activities, influenced only by pro-environmental attitudes. Furthermore we observed higher scores on justification, NEP, and GEB scales among Hungarians. Gender differences appeared only among Americans where women showed more environmental concern than men.

## **1 Introduction**

This study examines the role of justification of non-behavior as an inhibiting factor and that of positive environmental attitudes as an encouraging factor towards pro-environmental behavior for an American and Hungarian sample. Furthermore, the effect of positive attitudes is examined by the increase of the perceived criticality of an individual's deeds in solving environmental problems and, as a consequence, by the decrease of the acceptance of false reasons that justify non-behavior.

The novelty of the examination is the introduction of justification into the framework of understanding the relationship between attitude and behavior (Guagnano, Stern, & Dietz, 1995; Hines, Hungerford, & Tomera, 1987; Kaiser, 2006; Thøgersen, 1999), with special attention paid to the gap between positive environmental attitudes and pro-environmental behavior. Justifying statements are false statements suggesting that improper deeds (from the aspect of environmentalism) actually have positive consequences or proper behaviors have negative ones.

According to our expectations, positive environmental attitudes encourage pro-environmental behavior on the one hand and they enhance the feeling of perceived criticality in doing something positive for the environment on the other. Furthermore, feeling of perceived criticality makes the agreement with false, behavior-antagonist justification views less probable. We also predict that this model is dependent on national culture. Our doubts were raised regarding the role of justification as cultural differences can be found regarding the intensity of cognitive dissonance reduction mechanisms (Heine & Lehman, 1997; Hoshino-Browne, 2012); Hungarians expectedly perform in a less intensive way (Kokkoris & Kühnen, 2013; Van der Toorn, Berkics, & Jost, 2010).

### **1.1. The relationship between environmental attitudes and environmental behavior**

Positive environmental attitudes and behavior are positively correlated according to many empirical studies (Guagnano et al., 1995; Hines et al., 1987; Kaiser, 2006; Thøgersen, 1999). Theory of Planned Behavior (TPB; Ajzen, 1991), Norm Activation Model (NAM; Schwartz, 1977) and Value-Belief-Norm Model (VBN; Stern & Dietz, 1994; Stern, Dietz, & Guagnano, 1995) are the most cited models to explain the relationship. All of them state that pro-environmental behavior arises from people's notions that the environment is under a threat and that they are able to make effective actions in order to protect it. Models differ in deriving this

intention from values (NAM; VBN), attitudes (TPB, VBN) and/or norms (TPB; NAM) and resemble to each other in the concept of control.

These three models conclude the significant influence of attitudes and behavioral control on behavior, and also the influential role of normative aspects of values. In our study we acquired data about environmental attitudes, pro-environmental behavior and behavioral control from the previously mentioned determinants of pro-environmental behavior. Regarding values, we only used implicative explanations from other studies dealing with cultural differences in connection with values. Furthermore, we introduced a new aspect, namely the justification of non-behavior. Although positive attitudes are admittedly shown to be interrelated with behavior, it is true that lack of actions can also be present even if one bears positive attitudes towards the environment (Kollmus & Agyeman, 2002). Recently, a growing interest is being devoted to understand the simultaneous presence of pro-environmental attitudes and non-behaving. This line of research focus has the potential to enhance the efficiency of promoting pro-environmental behavior. In our view, justification of non-action can be a good candidate for a factor, explaining the gap between attitudes and behavior.

## **1.2. Perceived criticality**

Control over the success of one's own behavior, in general, is an integral part of all of the models, which is described in the attitude-behavior relationship (Ajzen, 1991; Schwartz, 1977). The attitude-behavior relationship research provides observations suggesting that, in general, it is the concept of self-efficacy which most efficiently captures what we mean by "control" in this context (Ajzen, 2001). While environmentally friendly behavior is a cooperative choice in a vast social dilemma situation (Van Vugt, 2001), and while the concept of perceived criticality was conceived specifically for describing Bandura's self-efficacy (1977) in social dilemma situations

(Kerr, 1989), we suggest the concept of perceived criticality instead of the general concept of control in the proposed model.

By definition, perceived criticality refers to “one’s perception about one’s criticality in the provision of public good” (Chen, Au, & Komorita, 1996, p. 39). Experimental evidence has confirmed that as the level of perceived criticality increases, people are more inclined to contribute to social dilemma situations (Chen et al., 1996; De Cremer & van Dijk, 2002).

De Cremer and van Dijk (2002) generally supported the idea that feelings of social responsibility are the mediating factor between perceived criticality and behavior; however, they proposed that low perceived criticality in a social dilemma may induce justification of non-cooperative behavior thereby preventing the actor from feelings of cognitive dissonance. This process can have an inhibiting effect on cooperative behavior. Embracing this proposal, we have suggested inserting justification of non-behavior between perceived criticality and non-behavior into the proposed model.

### **1.3. Justification of non-behavior as a way of reducing cognitive dissonance**

Justification of non-behavior can prevent an individual from feeling conflicting cognitions when choosing non-behavior. According to the original theory of cognitive dissonance, a state of discomfort arises when two simultaneously relevant but inconsistent elements of knowledge are held by individuals. People are then motivated to reduce the inconsistency of these cognitions which requires specific psychological efforts (Festinger, 1957). Behavioral commitment is an integral part of the theory and cognitive dissonance follows behavior.

Because justification in our proposed model, in line with the suggestion of De Cremer and van Dijk (2002), is seen as a prerequisite of behavior, we refer to the action-based model of cognitive dissonance (Harmon-Jones, Amodio, & Harmon-Jones, 2009), which integrates

previous revisions of Festinger's theory. The model departs from the original theory regarding the role of behavioral commitment in dissonance reduction assuming that not all the perceptions and cognitions are activated consciously and deliberately, including cognitions with action-implications. The discrepancy of cognitions with action implications evokes negative effects, namely dissonance, as these cognitions interfere with effective actions.

Empirical studies of this line of research typically take a causality-oriented perspective (see, e.g., Harmon-Jones et al., 2009; Harmon-Jones, Harmon-Jones, Fearn, Sigelman, & Johnson, 2008). Consequently, our questionnaire study, which tests path models, cannot be seen to follow that trend; however, the model proposed in this study was considerably influenced by the action-based model of cognitive dissonance. In the environmental-behavioral context, agreeing with views that justify non-behavior can prevent an individual from feeling conflicting cognitions if he or she tends to choose the environmentally unfriendly alternative. These justifying views can disregard the harmful effects of non-behavior or reframe the advantageous effect of a pro-environmental act as disadvantageous.

Included are examples of various studies that have seen justification playing significant role in explaining environmentally non-friendly behavior. Bratt (1999) provided empirical evidence showing that participants with positive general environmental attitudes refused that intensive recycling behavior justifies car use. He also found accepting this justification to be in negative correlation with environmentally friendly behavior; however, this latter relationship was weaker than the former one suggesting that justification works against pro-environmental behavior mainly among persons with relatively unfavorable attitudes towards the environment. Bratt's study (1999) also underpins the notion that easy-to-make pro-environmental behavioral steps are perceived to justify other more environmentally damaging behaviors which implies that cognitive dissonance felt after a negative deed can also be reduced by performing a simple



positive one. Thøgersen and Crompton (2009) have shown the characteristics of simple and painless ways of dissonance reduction that offer specious relieves for individuals. Hansmann, Bernasconi, Smieszek, Loukopoulos, and Scholz (2006) also emphasized self-justification tendencies in the attitude-behavior relationship. By analyzing the data of their Swiss survey sample, they showed that disagreement with justification views (e.g., since batteries are small, the small amount of harmful components can be neglected) has a considerably positive impact on waste disposal behavior (i.e., recycling used batteries). They argue that dissonance reducing justifications emerge mostly as a result of interfering social norms and non-behavior.

#### **1.4. Cultural differences in cognitive dissonance reduction**

The main focus of our paper is the role justification plays in determining pro-environmental behavior. Research on cognitive dissonance reduction has revealed the phenomenon to be culture-dependent.

Heine and Lehman (1997) stated that Americans show considerably more cognitive dissonance reduction when they do not behave in line with their attitudes compared to other cultures. Differences of attitudinal responses between North Americans and East Asians were revealed for difficult decisions which contain similar or very close alternatives. In the case of North Americans, typical spreading of alternatives following a difficult decision occurred more often (i.e., overvaluing the chosen and undervaluing the not chosen alternatives). They explain their results basing on the notion of self-concept: Americans are individualistic (Markus & Kitayama, 1991; Triandis, 1989) and have independent self-concepts (Campbell et al., 1996); consequently, they strongly feel the need of self-coherence which is supported by self-justifications. The importance of self-coherence in the reduction process was approved later on by Hoshino-Browne and colleagues (2005), however, they showed the source of coherence-

feelings be culture-dependent. The action-based model of cognitive dissonance (Harmon-Jones & Harmon-Jones, 2002; Harmon-Jones et al., 2009) also proposed that dissonance reduction is culture-dependent, as cultures can differ in tendencies toward action-orientation that are correlated with the need for self-consistency.

The present study deals with an American-Hungarian comparison. It should be noted that we have not found empirical studies in which cognitive dissonance reduction was compared between Hungarians and Americans. Nevertheless, we do see empirical confirmation revealing that moderately individualistic and self-independent Eastern Europeans show and reduce cognitive dissonance less intensely than individualistic and self-independent Western Europeans (Kokkoris & Kühnen, 2013). In addition to that, there are studies that reveal less intense system-justification functioning in the case of Hungarians, compared to Americans (Van der Toorn et al., 2010). System justification refers to legitimizing existing social arrangements which can be considered to be a form of cognitive dissonance reduction manifesting in a societal context (see, e.g., Jost, Banaji, & Nosek, 2004).

### **1.5. Gender differences in ecological behavior**

Although gender differences were not in the main focus of our study, we did not want to exclude such a basic demographic variable from the scope of attention, as many studies have shown that women tend to be more concerned with environmental issues (Hunter, Hatch, & Johnson, 2004; McStay & Dunlap, 1983; Mohai, 1992; Stern, 1992; Zelezny, Chua, & Aldrich, 2000).

These results can be derived from the differences in gender socialization processes. Because of their traditional caretaker role, women are more likely to embrace altruistic values (e.g., Dietz, Kalof, & Stern, 2002), which is associated with perceiving community as the whole

world, including the environment as well (Blocker & Eckberg, 1989; Davidson & Freudenburg, 1996). Thus females are more inclined to hold positive attitudes toward nature and toward the importance of maintaining life (McStay & Dunlap, 1983).

## 2 Objectives

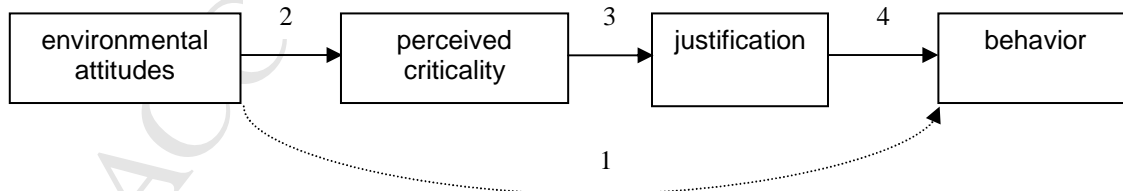
Our study concerns the relationships between environmental attitudes, sense of control over the success of behavior, justification of non-behavior, and self-reported environmental behavior. Beyond these relationships, our research also provides information about the descriptive characteristics of the involved variables in the two samples.

Regarding the relationships of the involved variables, we have outlined a model (*Figure 1*). We built the model in accordance with the signed effects in *Figure 1*.

1. Positive environmental attitudes have positive, direct impact on pro-environmental behavior (*Hypothesis 1*). Positive attitudes and behavior are positively correlated according to many empirical studies (Guagnano et al., 1995; Hines et al., 1987; Kaiser, 2006; Thøgersen, 1999). However, environmental attitudes and behavior do not correlate strongly (Dunlap & Van Liere, 1978; Leung & Rice, 2002). Some authors suggest that there may be further variables mediating the relationship between worldviews and behavior (e.g., Bamberg, 2003; Corral-Verdugo, Bechtel, & Fraijo-Sing, 2003). The TPB (Ajzen, 1991), VBN (Stern & Dietz, 1994) and NAM (Schwartz, 1977) theories of ecological behavior also involve mediating variables. In our model, we investigated the role of the belief about behavioral control over desired outcomes (perceived criticality) and the role of justification of non-behavior.

2. Positive attitudes have a positive impact on feeling responsible for taking effective actions in order to protect the environment from harmful effects. This is one of the core statements of the VBN and NAM theories (Schwartz, 1977; Stern & Dietz, 1994). The VBN model postulates a link between ecological worldview (positive environmental attitudes, i.e. NEP) and perceived ability to reduce effects threatening the environment. We find that capability, in this context, corresponds to the notion of self-efficacy. Feelings of self-efficacy prove to be a very successful substitute for perceived behavioral control when testing the TPB model in diverse applied fields (Ajzen, 2001). In the context of pro-environmentalism, which can be taken as a global social dilemma (Van Vugt, 2001), perceived criticality is an appropriate construct for capturing the notion of self-efficacy (Chen et al., 1996; De Cremer & van Dijk, 2002). Although the TPB model treats attitudes and behavioral control independently, we propose that individuals with positive attitudes feel more than negligible criticality in cooperative contributions, i.e. ecological behavior (*Hypothesis 2*). When someone's criticality in solving a problem is as low as it is in solving global environmental problems, it is plausible to assume that positive attitudes increase the level of perceived criticality.
3. Judging one's own potential contribution to managing global environmental problems as more than negligible decreases the acceptance of justification views that legitimize non-behavior (*Hypothesis 3*). We share the opinion of De Cremer and van Dijk (2002), who suggested that low perceived criticality can make cooperative behavior less likely through justification. Similarly, high perceived criticality may induce refusing the justification of non-behavior, since, supposedly, justification is an element of a process in which thoughts with action implications are organized in a consistent way.

4. Justification of non-behavior has an inhibiting impact on behaving pro-environmentally (*Hypothesis 4*) by preventing an individual from feeling conflicting cognitions when choosing non-behavior. In classic literature on cognitive dissonance, this reduction process takes places after behavioral commitment (Aronson, 1969; Cooper & Fazio, 1984; Festinger, 1957; Steele, 1988); in more recent interpretations of cognitive dissonance (i.e. action-based model of cognitive dissonance, Harmon-Jones et al., 2009), justification may function to support efficient implementation of actions by preventing the actor from experiencing conflicting views concerning a certain action. In this frame, justification can precede behavior. Specifically in the case of ecological behavior, these justifications reduce the harmful effects of non-behavior or reframe the advantageous effect of a pro-environmental act as disadvantageous. In the environmental context some authors have reported negative correlations between accepting justification views and behavior. According to Bratt (1999), accepting that intensive recycling behavior justifies car use is positively correlated with car use. Hansmann and colleagues (2006) showed that disagreement with justifications has a considerable positive impact on recycling used batteries.



*Figure 1.* The suggested model for relationships between attitudes, perceived criticality, justification and self-reported environmental behavior

Furthermore we hypothesize cultural differences to emerge in respect of this latter relationship, which is expected to be weaker in case of Hungarians compared to Americans (*Hypothesis 5*). According to the cross-cultural studies on cognitive dissonance reduction, American culture represents a milieu where cognitive dissonance reduction is an intense function (Heine & Lehman, 1997). Typically the individualistic, self-independent orientation of individuals, implying strong need for self-coherence, is mentioned when interpreting this dissonance-averse characteristic of American culture (Campbell et al., 1996; Markus & Kitayama, 1991; Triandis, 1989). Hungarians have not been examined in this specific aspect yet. Despite the fact that they are far from the typical East Asian end-point of standard dissonance-comparison in their collectivism (Danis, 2003) they expectedly do not rely on cognitive consistency as much.

We articulate this expectation relying on differences between the two cultures emerging from cognitive dissonance-relevant contexts. First, the characteristic of action-orientation can differentiate between Americans and Hungarians. In action-orientation, the value of an efficient action is reflected and cultures differ in this respect (Harmon-Jones et al., 2009). For example, cultures with less definite action-orientation may be more likely to tolerate conflicting views regarding a certain action. Among Americans, where competence, success and capability are highly appreciated values (referred to as “mastery culture” by Schwartz, 2007), action-orientation supposedly is more present than among Hungarians, who have values that are somewhat different from a mastery culture. Hungary, according to Schwartz (2007), is more representative of a country with a “harmony culture” with important values such as fitting into the world as it is, unity with nature, etc. Second, there are some other empirical findings supporting the expectation that Hungarians do not need cognitive consistency as much. Kokkoris and Kühnen (2013) argue that Eastern Europeans reduce cognitive dissonance less intensely than the individualistic and

self-independent Western Europeans. Hungary, as an Eastern European country, probably fits the pattern. Furthermore, the study of Van der Toorn and colleagues (2010) revealed that system-justification (as a form of cognitive dissonance reduction in a societal context) functions less intensely in the case of Hungarians, compared to Americans. Thus, to have chance of observing differences in interrelations between variables described in our model across subject-pools, we conducted a questionnaire study in Hungary and in the USA. As reasoned above, potential differences in action-orientation (Harmon-Jones et al., 2009) and cognitive dissonance reduction (Kokkoris & Kühnen, 2013; Van der Toorn et al., 2010) and also documented difference in cultural value orientation (Schwartz, 2007) offer a good opportunity examine such differences.

Roughly, Hungary falls into the same group of “High Income” countries as the USA when countries are categorized based on the Gross National Income per Capita index<sup>1</sup>. This fact may be relevant because affluence may have an impact on environmental attitudes and their consequences; however, results on affluence are inconclusive. Many studies have argued a relation between higher levels of environmental concern and more affluent economies (Diekmann & Franzen, 1999; Franzen, 2003; Franzen & Meyer, 2010; Gelissen, 2007; Inglehart, 1990; 1995; Oreg & Katz-Gerro, 2006), while others have questioned this relationship (Dunlap, Gallup, & Gallup, 1993; Dunlap & York, 2008; Fairbrother, 2012; Givens & Jorgenson, 2011; Mostafa, 2011). We share the view that affluence does have an impact on environmentalism not only by influencing value priorities, but by offering higher freedom in choice for behavioral alternatives on both the pro-environmental and on the environmentally harmful side (see, e.g., Vlek & Steg, 2007). Assuming that affluence may factor into the results, we attempted to minimize the

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<sup>1</sup> At the time of data collection Hungary was categorized as a “high income” country. Since that time parameters of income groups, the names of categories and the method of categorization have changed, and even the status of Hungary has been altered.

differences in subject pools in this respect by limiting the selection of participants to working adults of the middle and upper middle economic class. They may simply have more options when making environmental choices as compared to students or financially burdened individuals, who might be more restricted because of financial or parental issues.

### 3 Method

#### 3.1. Sample and procedure

We collected survey data from 100 Hungarian and 100 American citizens. Of course, the Hungarians received a Hungarian version of the questionnaire and the Americans received an English one. The Hungarians were from the city of Nyíregyháza, which is in Eastern Hungary, and the American sample consisted of people from the city of Baton Rouge, the capital of Louisiana, located in the south of the USA (the size of the two cities are comparable). The data was collected between August and November of 2011. The participants responded voluntarily and anonymously and were not compensated for their participation. Most of them were contacted at their house, and a few were asked to participate while at their workplace. Our sample should not be regarded as completely representative, as we had a certain selection process. Matching various characteristics of the samples both samples contain data from working adults from the high or middle class economically, living in suburban areas, and of similar age ranges. We allowed one survey per household for participants. The means and standard deviations of age for the American and Hungarian samples were 39.53 years ( $SD = 8.34$ ) and 38.82 years ( $SD = 7.27$ ), respectively. In the American sample, 43% of the participants were male and, similarly, in the Hungarian sample 44% were male. Most of the participants in this study claimed to have a high



educational level: 86% (67%) of the American (Hungarian) participants claimed to have a college or university degree and the rest claimed to have finished high school.

### 3.2. Measures

For our study, we used self-report questionnaires. Accuracy with self-report surveys is generally an issue, but many studies have used self-report techniques to measure ecological behavior and they have found, in these cases, that the effect of social desirability is only marginal (Kaiser & Wilson, 2004).

We developed the questionnaire to measure environmental attitudes, environmental behavior, behavioral control over desired outcomes (perceived criticality) and justification. The questionnaire consisted of 105 items. It took approximately twenty minutes for the participants to fill in a survey. We used five items for self-report of the respondents' demographic characteristics (age, sex, education, marital status and place of living). Aside from the demographic items, our questionnaire consisted of the revised NEP scale, the GEB scale as well as scales designed to measure perceived criticality and the justification of non behavior.

#### *Environmental attitudes (NEP)*

The NEP scale was originally developed by Dunlap and Van Liere (1978) in order to measure a society's views on nature and a society's own relationship to nature. In general, the statements of this scale express that nature is threatened and should be treated with special attentiveness. We used the revised NEP scale (Dunlap, Van Liere, Mertig, & Jones, 2000), which consists of 15 items (7 reversed) such as '*We are approaching the limit of the number of people the earth can support.*' or '*Plants and animals have as much right as humans to exist*'. Responses were provided on a 5-point Likert-scale with the end-points '*1 = strongly disagree*' and '*5 =*

*strongly agree*'. The 7 reversed items were coded in reverse. Using this coding technique, the higher the NEP score of an individual, the higher his/her ecocentric orientation (Dunlap et al., 2000).

Even though the NEP scale has 5 subscales (reality of limits to growth, anti-anthropocentrism, the fragility of nature's balance, rejection of exemptionism, possibility of an ecocrisis), most of the studies used one summary score for all of the items and didn't use a score for each subscale (Hawcroft & Milfont, 2010). This revised NEP scale has been used in several studies and within diverse cultural contexts (Boeve-de Pauw, Donche, & Van Petegem, 2011; Lee & Paik, 2011; Liu, Ouyang, & Miao, 2010; Schultz & Zelezny, 1999).

Some authors note that the NEP and environmental behaviors do not correlate strongly (Dunlap & Van Liere, 1978; Leung & Rice, 2002). We chose to use it regardless of these concerns because we share the view that there may be further variables mediating the relationship between worldviews and behavior (e.g., Bamberg, 2003; Corral-Verdugo et al., 2003), and, specifically, we investigated the role of the belief about behavioral control over desired outcomes (perceived criticality) and the role of justification of non-behavior.

### *Perceived criticality*

Perceived criticality was measured by the simple question '*How critical do you think your contribution will be for...*' (inspired by the idea of perceived criticalness in the literature of social dilemmas, see De Cremer & van Dijk, 2002). We generated 6 items based on the above question (one item for each category of the GEB scale). For example, the item regarding energy conservation was as follows: '*In your opinion, how critical do you think your own contribution will be for energy conservation?*' Again, scoring was done using a 5-point Likert-scale, where the number 1 indicated '*completely insignificant*' and the number 5 indicated '*makes a difference*'.

### *Justification*

We generated 33 items altogether for the categories of environmental behavior concerned by the GEB scale to measure the agreement with cheap justification for non-behavior (see the *Appendix*). On all of the items, participants responded on a 5-point Likert-scale, where '1 = *strongly disagree*' and '5 = *strongly agree*'. The generated items are irrational beliefs and opinions as a collection of individuals' personal opinions and biases. Many may sound somewhat reasonable, but have no actual truth supporting them. For example, a person who does not recycle might justify as such: *'It takes more energy and creates more pollution to recycle things than it does to place it in a landfill.'* Or people may attempt to reassure themselves when their behavior is harmful to the environment by justifying that the whole thing is just a marketing trick: *"Going green" is an expression which only sounds good and was coined as a marketing ploy in order to sell more products.'*

In order to develop these scales we collected information from several American and Hungarian online forums discussing environmental problems and checked how everyday people reason when they do not behave pro-environmentally. We also used the results of a study (JWT, 2009) that explores what makes Americans worried and discusses some ideas about what the average person thinks "to be green" means.

### *Environmental behavior*

The GEB scale (General Ecological Behavior; Kaiser, 1998) is a tool which is able to measure ecological behavior across cultures. The version we used is a composite of 50 performances, and is a reliable and valid set of behaviors (Kaiser & Wilson, 2004). These behaviors can be grouped into 6 domains, including: energy conservation, mobility and

transportation, waste avoidance, consumerism, recycling, and vicarious social behaviors toward conservation. Following Kaiser and Wilson (2004), we used a 'yes/no' format for certain items and a 5-point Likert-scale with the end-points 'never' and 'always' for behaviors which cannot easily be split dichotomously. Twenty-one items were easily answered with the yes/no format, for example: '*I am a member of an environmental organization.*' and the other 29 items were answered with a 5-point Likert-scale, for example: '*I keep the engine running while waiting in front of a railroad crossing or in a traffic jam.*' The responses given on the 5-point Likert-scale were recoded dichotomously, so 'often' and 'always' were coded as positive responses and 'occasionally', 'seldom' and 'never' were coded as negative responses. This recoding was necessary for the data analysis (Kaiser & Wilson, 2004). Nineteen items were negatively formulated and the responses to these items were coded in reverse. We added two items (5-point Likert-scale) concerning air condition use in the car and in the house, because, today, this seems to be a more common activity and has a significant effect on an individual's total energy use.

Under certain circumstances, it may not always be possible for the participant to answer all of the items. An example of this can be when a participant does not have a driving license or a family does not have a car. In these cases, some of the items regarding car habits will not have an answer and are coded as missing values (Kaiser & Wilson, 2004). During the data analysis, we used the conventional principal (Kaiser, 1998; Kaiser & Biel, 2000) to deal with missing values. If an activity does not relate to a person, that person does not do that activity. Not doing a beneficial activity is a negative, while not doing a damaging activity is a positive response. In the GEB scale, each behavior has a certain difficulty level based on how many people can perform the given behavior in the sample. To analyze the results of the scale, the Rasch-model was used (Kaiser, 1998; Kaiser & Biel, 2000; Kaiser & Wilson, 2004).

## 4 Results

### *Descriptive characteristics of the two samples*

*Table 1* and *Table 2* report on the descriptive characteristics of the American and Hungarian sample, respectively. The reliability of our measurement tools proved to be high in both cases.

	<i>M</i>	<i>SD</i>	1	2	3	4
1. NEP	3.21	0.66	(.83)			
2. criticalness	3.21	1.04	.40**	(.94)		
3. justification	2.27	0.51	-.30**	-.42**	(.88)	
4. behavior			.29**	.29**	-.39**	(1.2x10 <sup>18</sup> )*

*Table 1.* Scale characteristics (reliability) and descriptive characteristics (means and standard deviations), together with correlation values (*r*) between the answers at the scales: American sample. Note: *N* = 100. Cronbach's alpha reliabilities are in parentheses on the diagonal; in case of behavior (GEB) Tobs value is presented from the Rasch-model. \**p* < .05, \*\**p* < .01

	<i>M</i>	<i>SD</i>	1	2	3	4
1. NEP	3.86	0.54	(.79)			
2. criticalness	3.22	0.80	.19	(.84)		
3. justification	2.57	0.39	-.40**	-.19	(.87)	
4. behavior			.25*	.33**	-.20*	(4.5x10 <sup>16</sup> )*

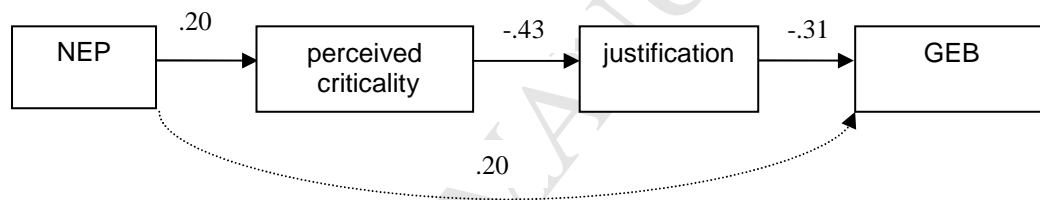
*Table 2.* Scale characteristics (reliability) and descriptive characteristics (means and standard deviations), together with correlation values ( $r$ ) between the answers at the scales: Hungarian sample. Note:  $N = 100$ . Cronbach's alpha reliabilities are in parentheses on the diagonal; in case of behavior (GEB) Tobs value is presented from the Rasch-model.  $*p < .05$ ,  $**p < .01$

To test for cultural and gender differences in NEP values, in self-reported environmental behaviors, in perceived criticality and in justification scores, a two-way MANOVA was performed. The independent variables were culture and gender, each with two levels. The dependent variables were NEP values, GEB scores (Rasch-p values), the averages of perceived criticality items scores and justification items scores. The results indicated that there was a significant multivariate effect of culture ( $F_{4, 193} = 50.28, p < .001$ ). Univariate analysis indicated that there was a significant cultural difference for NEP values, GEB values and justification scores (for all cases  $p < .001$ ). Hungarians endorsed NEP values and reported more pro-environmental activities; however, at the same time Hungarians accepted justification items to a larger extent. Concerning perceived criticality, Americans and Hungarians felt equal and moderate power regarding contribution to the solution of environmental problems. Neither the multivariate gender main effect, nor the multivariate culture by gender interactive effect was significant. When Hungarians and Americans were analyzed separately, MANOVA results still indicated no significant multivariate effect of gender, moreover at the univariate level of analysis the only observable gender difference was that American females appeared to endorse NEP values somewhat more than American males ( $F_{1, 98} = 3.48, p = .06$ ).

*Testing the model (Hypotheses 1, 2, 3, 4, & 5: Relationships between the variables on the two samples)*

First, we hypothesized in our model (*Figure 1*) that positive environmental attitudes (measured on the NEP scale) encourage pro-environmental behavior (as it is reported on the GEB scale). Second, positive attitudes enhance the feeling of perceived criticality, which consequently makes the agreement with behavior-antagonistic justification views less probable. We also hypothesized the model-fit to be dependent on culture.

The model was fitted using the *\*sem\** package of the R statistical software to each of the two samples to test the above hypotheses. It fitted nicely to the American sample (RMSEA = .08, SRMR = .05) (*Figure 2*), but did not fit to the Hungarian one (RMSEA = .35, SRMR = .15).



*Figure 2.* The path model for the American sample

Relying on what we hypothesized regarding the relationship between the involved variables (a culture-independent pattern concerning connections between attitudes, perceived criticality and reported behavior, and a culture-dependent relationship between justification and reported behavior), and also relying on what we observed in *Table 1*, we introduced a corrected version of our baseline model, shown in *Figure 3* (which presents the coefficients for the Hungarian sample). The major difference between the two models is the role of justification. While justification significantly influences behavior in the baseline model, the modified model predicts justification having no significant influence on behavior. The modified model for the Hungarian sample has shown a satisfying fit (RMSEA = .00, SRMR = .03). Importantly, this new

model did not seem to be appropriate for the American sample (RMSEA = .31, SRMR = .13). These results confirmed the hypothesis that justification plays a significant role in the case of the American sample, but it does not influence the behavior significantly in the case of the Hungarian sample.

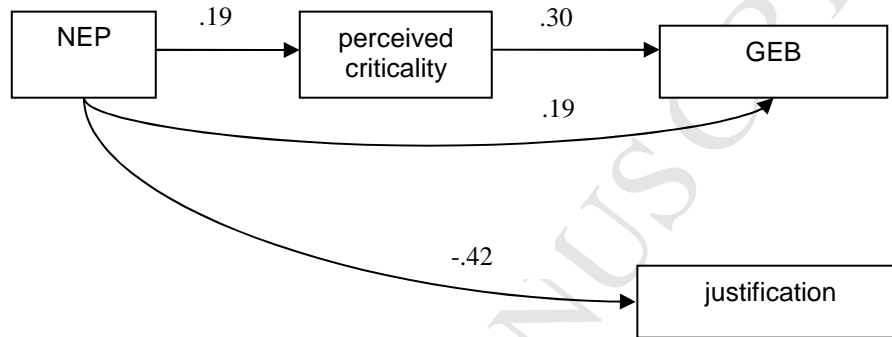


Figure 3. The path model for the Hungarian sample

## 5 Discussion

To summarize, our data supported the idea that positive environmental attitudes encourage pro-environmental behavior (*Hypothesis 1* confirmed) and that they also enhance perceived criticality (*Hypothesis 2* confirmed). Furthermore, feelings of perceived criticality decreased the acceptance of behavior-antagonistic justification views (*Hypothesis 3 and 4* confirmed for the American sample). Thus, the summarized relationships depended on national culture to some extent (*Hypothesis 5* confirmed). Concerning the main focus of our research, we concluded that there is room for justification in the attitude-behavior framework of pro-environmental behavior; however, it is not stable but culture-dependent. In the American sample, justification clearly had a direct and negative influence on self-reported environmental behavior;



there was not a direct connection with behavior in the Hungarian sample where justification of non-behavior and reported behavior were not as strongly connected.

Theoretically, we relied on the action-based model of cognitive dissonance (Harmon-Jones et al., 2009) when we hypothesized that justification can precede behavior and can prevent an actor from pro-environmental behavior. The actor can justify non-behavior even in the presence of pro-environmental attitudes if he or she has a tendency to choose the harmful option. Perceived criticality and accepting justifying views of non-behavior were negatively correlated in our study, which is in line with the main point of the action-based model of cognitive dissonance in which justification can precede behavior. If justification takes place after the behavior in the overwhelming majority of cases, non-behavior and high perceived criticality would result in accepting justification-views. One may question appropriateness of conceptualizing rationalization and behavior in a holistic manner as we did. Studies that refer to cognitive dissonance theory when explaining environmental behavior mention, measure and interpret dissonance reduction and behavior mostly on a specific level (see, e.g., Bratt, 1999; Hansmann et al., 2006; Thøgersen, 2004; Thøgersen & Crompton, 2009). In our view, the summative level is also maintainable. Although environmental behavior is consistent when perceiving similarities between different behaviors by the actor (see Thøgersen, 2004), the use of the GEB-scale and the high consistency of our self-developed scales measuring perceived criticality and agreement with justification views give additional support to the method we applied.

According to the action-based model of cognitive dissonance, action-orientation provides a background for efficient behavior implementation since action-orientation implies a need for non-conflicting cognitions. While American culture served as a representative of a milieu where cognitive dissonance reduction is an intense function (Heine & Lehman, 1997), based on available data, Hungarian culture was expected to be not as cognitive dissonance averse

(Kokkoris & Kühnen, 2013; Van der Toorn et al., 2010). Concerning the notion of action-orientation, we also judged the well-documented differences between Americans and Hungarians regarding mastery and harmony value orientation (Schwartz, 2007) as relevant. Mastery relevant values of success, capability and influence are appreciated more by Americans than by Hungarians. This is in harmony with the supposition that supporting the implementation of a behavior by reducing cognitive dissonance can be more typical of Americans than Hungarians. Our observations on the Hungarian sample are comparable to Bratt's (1999), who used a Norwegian sample to show that the link between attitudes and justification is much stronger than the link between justification and behavior. Concerning the NEP values and environmentally friendly behavior, we found not only the indirect but a direct link between them in both samples. This finding is consistent with studies that have reported connections between the two concepts (Poortinga, Steg, & Vlek, 2004; Schultz & Zelezny, 1998; Vining & Ebreo, 1992) and it is consistent with studies that argue for a mediated relationship (Bamberg, 2003; Corral-Verdugo et al., 2003; Nordlund & Garvill, 2003), as well.

Our study let us both examine functions and also observe cultural and gender differences regarding the implemented measurements. Hungarians appeared to be more environmentally friendly both in their views and behavior. Cultural differences resulting from an emphasis on mastery or harmony values can serve as an explanation for positive differences in attitudes and reported behavior favoring Hungary (Schwartz, 2007).

In respect to perceived criticality of environmentally significant behavior, there was no difference found. Notably, while 8% of the Americans reported the maximum perceived criticality, only 1% of the Hungarians did the same. Additionally, while perceived criticality was strongly correlated with NEP values in the American sample, the two phenomena have a weaker relationship in the Hungarian one. The proportion of highly devoted people, who are definitely

motivated by environmental concern, together with the presence of less conscious others, show that Americans are rather heterogeneous in respect to environmental issues.

The data brought an unexpected result regarding agreements with justification statements of non-behavior. Hungarians displayed more agreements, although neither Americans, nor Hungarians seemed to truly embrace these false views. Environmental issues have been present in general dialogue for a longer time in the USA than in Hungary (Schultz, 2002), and, perhaps, these kind of justifications are socially less desirable. It should be noted that justification was measured by the level of acceptance of statements that expressed false justification views. Perhaps, individuals may invent subtle justifications that support their own choices and refuse obviously false justifications at the same time.

Finally, we could not report on the robust gender effect that is observed by many studies (Hunter et al., 2004; McStay & Dunlap, 1983; Mohai, 1992; Stern, 1992; Zelezny et al., 2000). Only American women were more concerned about the environment than American men, and their difference was restricted to the agreement with the statements of the NEP scale. We may attribute this observation to the larger portion of working women in Hungarian society and, especially, larger portion of women in managerial roles in the middle class. Namely, we refer here to the bio-social gender role theory (Eagly, 1987; Wood & Eagly, 2002), that states that gender differences in attitudes and behavior have not only biological causes, but are also the consequences of the division of work in the society.

Besides the lack of data about subtle justifications, the samples certainly serve as limitations to our study. As regards to the samples, neither the American nor the Hungarian sample can be considered as fully representative of the American and Hungarian populations and the two samples were not perfectly matched up. Thus, our results should be treated with caution until further studies can be done to confirm our results. Nevertheless, our data suggests that

justification plays an important role in understanding a culture's positive environmental views and their non-behaviors. We suggest that more studies be done in order for a more complete understanding of the role of justification in this specific context.

## 6 Conclusion

Following the stream of research dealing with the relationship between environmental attitudes and behavior, we have suggested that accepting justifying views of non-behavior may also be a relevant step in the process. We made this proposal by referring to the action-based model of cognitive dissonance. By introducing justification, we have enlarged the set of candidates responsible for the attitude-behavior gap. According to our findings, justification and the perceived criticality of action are organic elements of an array beginning with attitudes and ending at behavior. However, this pattern proved to be culture-dependent. In our comparison study, the pattern was more typical of the American sample than in the Hungarian one. Further empirical data are needed to judge whether this difference can be attributed to different cultural value-orientations (mastery vs. harmony cultures) and/or to different action-orientations interrelated to cultural value-orientations. Based on our results, interventions encouraging pro-environmental behavior appear to support positive environmental attitudes, perceived criticality of positive deeds and also the behavior of uncovering the falsity of justifying views.

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## Appendix – Justification Scale

Energy conservation:

1. Energy saving light bulbs are damaging to the eyes.
2. The light that energy saving light bulbs give off is worse than the light of traditional bulbs.
3. Energy saving light bulbs contain mercury which is a health hazard and can escape into the atmosphere during garbage processing.
4. Insulated windows can cause fungus to grow on the walls of a house.
5. A car burns less gas when using the air conditioner than when driving with the windows rolled down because of air drag.
6. It will not help if I try to save electricity because somebody else will not try to save it.

Mobility and transportation:

7. Trains harm the environment even if they are electric powered instead of gas powered, because it still consumes a large amount of natural resources.

8. Trains cause a large amount of noise pollution.
9. Building railroad tracks causes a large amount of deforestation which destroys trees and robs animals of their natural habitat.
10. Public transportation that utilizes older buses creates more air pollution than modern cars.
11. It will not help if I use public transportation because somebody else will still use a car.

Waste avoidance:

12. Reusable grocery bags collect large amounts of bacteria which can cause infections. Single-use grocery bags, on the other hand, are a lot cleaner.
13. Reusable grocery bags contain unsafe levels of lead.
14. Cleaning reusable grocery bags wastes a large amount of water.
15. Reusable grocery bags are not much stronger than disposables and most of these reusable bags break before they have cancelled out their own carbon foot print.
16. Reusable grocery bags contain a lot more petroleum than single-use bags.
17. It will not help if I do not take a single-use grocery bag in the store because somebody else will take it.

Consumerism:

18. It will not help if I try to buy local produce instead of food transported from further distances because somebody else will not consider this.
19. Buying food in bulk will not help us economize because when we have a large amount of something we use it more freely and wastefully than when we have small amounts of it.
20. Products packaged in multiple protective layers are safer because it is less likely that bacterial agents will be on the product.

21. Cleaning reusable bottles wastes a large amount of water and energy.

#### Recycling:

22. It takes more energy and creates more pollution to recycle things than it does to place it in a landfill.
23. Modern technology has evolved to the point where landfills are actually helpful, as they serve as a source of natural gas power which is far cleaner than fossil fuels.
24. Recycling paper kills more trees than making new paper from tree farms does.
25. Recycling is simply a fraud that was created by big businesses in order to remove their responsibility for creating reusable and environmentally safer products.
26. It will not help if I recycle because somebody else will not recycle.

#### Vicarious social behaviors

27. The environment has already been damaged so much by urbanization, such as cities and roads, that it is useless to try to keep it clean
28. “Going green” is an expression which only sounds good and was coined as a marketing ploy in order to sell more products
29. Global warming does not really exist
30. Global warming has advantages also, for example we need less heating in the winter
31. Environmentalists naively believe that they can save the world; the ideas of the environmentalists are not achievable
32. While environmentalists are using cars too, they should not preach about protecting the environment
33. It will not help if I do not litter because somebody else will litter

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ACCEPTED MANUSCRIPT