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The Big Five personality traits as antecedents of eco-friendly tourist behavior

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ABSTRACT

This article reports the findings of a study, conducted among 227 foreign tourists who visited Cyprus, that aimed to identify the relationships between the Big Five personality dimensions and tourists' environmentalism. Structural equation modeling revealed that Agreeableness, Conscientiousness, Extraversion, and Neuroticism are positively associated with pro-environmental tourist behavior. In contrast, no significant relationship was observed between Openness and ecological action.

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1. Introduction

Eco-friendly tourist behavior (also referred to as pro-environmental or green behavior/action) occurs when an individual aims to minimize his/her detrimental impacts on the natural environment and otherwise contribute to environmental protection (Dolnicar, Crouch, & Long, 2008). For example, environmentally friendly tourists are ready to pay more for green hotels and engage in water/energy conservation, waste reduction, and recycling (Han, Hsu, Lee, & Sheu, 2011). In an attempt to understand how green behavior can be encouraged, over the last 40 years scholars have been exploring the drivers of pro-environmental action. In the tourism context, much of environmental research has focused on the role of values, attitudes, beliefs, and norms in shaping green behavior (e.g., Aipanjiguly, Jacobson, & Flamm, 2003; Wurzinger & Johansson, 2006). Meanwhile, just as the scholars have examined the relationships between the aforementioned concepts, simultaneous evolvement of the trait theory revealed that another important psychographic predictor of human's behavior is personality (Hirsh & Dolderman, 2007).

Although some studies have recently examined environmental engagement from the personality perspective (e.g., Fraj & Martinez, 2006; Hirsh, 2010; Wiseman & Bogner, 2003), there is a scarcity of research on the associations between personality traits and environmentally responsible behavior in a tourism context. Meanwhile, eco-friendly behavior is not consistent across different settings, and individuals tend to display greater environmental responsibility at home than on vacation (Miao & Wei, 2013). This difference implies that generalizations are not reliable and calls for an independent investigation of the personality determinants of environmental behavior in a tourism context. Besides, the absolute majority of the existing personality studies (with the exception of Markowitz, Goldberg, Ashton, & Lee, 2012) have examined non-behavioral environmentalism (beliefs, norms, attitudes, intentions), while there is evidence that despite declared positive attitudes towards eco-friendly tourism, only few tourists act upon them (Budeanu, 2007). This attitude-behavior gap implies that studies using non-behavioral constructs are limited in their ability to explain actual environmental behavior (Markowitz et al., 2012). Notably, one reason for the difference between stated environmental attitudes and behavior may be the social desirability bias (Leggett, Kleckner, Boyle, Dufield, & Mitchell, 2003), which often causes inaccurate reports on sensitive subjects such as eco-friendliness. Given this, ex post investigations of previous acts could yield more truthful answers and significantly increase the reliability of results (Kahneman, 2003), necessitating further research into behavioral environmentalism.

Finally, the findings of recent studies on the relationship between personality and environmentalism are inconsistent and contradictory (Markowitz et al., 2012; Milfont & Sibley, 2012). In light of these factors, the objective of the present research is to partially address the aforementioned gaps by identifying the relationships between personality and tourist environmentally conscious behavior. Specifically, personality traits will be operationalized using a well-validated 'Big Five' taxonomy, which enjoys the highest level of popularity in the relevant studies and comprises five broad dimensions of Extraversion, Agreeableness, Conscientiousness,

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Neuroticism, and Openness (also referred to as Openness to Experience or Intellect/Imagination) (McCrae & Costa, 1985).

2. Model and hypotheses

Figure 1 shows the conceptual model which posits that Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness positively influence tourist eco-friendly behavior. *Extraversion* refers to the extent to which a person is social, talkative, assertive, energetic, and outgoing (McCrae & Costa, 1985). While some environmental studies did not find any links between Extroversion and environmental concerns (e.g. Hirsh, 2010; Hirsh & Dolderman, 2007), others (e.g., Fraj & Martinez, 2006; Markowitz et al., 2012) reported that individuals who score highly on Extraversion tend to show more environmental behaviors (this link was especially strong between the activity facet of Extraversion and pro-environmental action). Another interesting finding was provided by Milfont and Sibley (2012) whose study demonstrated that Extraversion had a significant effect on environmental engagement at the country level. Most importantly, past research indicated that Extraversion is positively associated with such post-materialistic values as self-expression and subjective well-being (McCrae, Terracciano, & 79 Members of the Personality Profiles of Cultures Project, 2005), which have been previously related to higher levels of environmental concern (Inglehart, 1990). Based on the above, we can cautiously posit that:

Hypothesis 1: Tourists with a higher score on Extraversion are likely to exhibit more environmentally friendly behavior.

Agreeableness refers to the individual's level of empathy, compassion, warmth, and generosity (McCrae & John, 1992). Agreeable people are usually forgiving, softhearted, cooperative, trustful, sympathetic to others, and eager to help (McCrae & Costa, 1985). Thus, Agreeableness is associated with being a 'good citizen', and agreeable individuals may act in an environmentally friendly way because they believe that such behavior is socially acceptable and contributes to the well-being of society (Markowitz et al., 2012). Besides, past studies on the link between personality traits and values revealed that Agreeableness is associated with Schwartz's (1992) higher-order value of Self-transcendence (Luk & Bond, 1993; Olver & Mooradian, 2003), the universalism component of which has three pro-environmental items (protecting the environment, unity with nature, and a world of beauty) (Milfont & Sibley, 2012). In fact, the majority of recent environmental studies (with the exception of Markowitz et al., 2012) suggest that higher levels of Agreeableness are related to greater non-behavioral and behavioral environmentalism (Fraj & Martinez, 2006; Hirsh, 2010; Hirsh & Dolderman, 2007; Milfont & Sibley, 2012). Indeed, it is logical to expect that individuals who are altruistic, empathetic, and compassionate would make more environmentally friendly tourists, and we therefore may hypothesize that:

Hypothesis 2: Tourists with a higher score on Agreeableness are likely to exhibit more environmentally friendly behavior.

Conscientiousness is described as the tendency of an individual to be organized, responsible, thorough, show self-discipline, and adhere to rules and norms (McCrae & Costa, 1985). Conscientiousness has been also linked with higher future time perspective (Zimbardo & Boyd, 1999), which other research has shown is strongly associated with greater environmental engagement (Milfont, Wilson, & Diniz, 2012). Indeed, individuals with long-term orientation are usually concerned with the consequences of their actions and tend to plan for better future outcomes, including ecological ones (Milfont & Sibley, 2012). Besides, being orderly and responsible, conscientious individuals carefully follow social guidelines for any kind of action, and this urge 'to do the right thing' can be reflected in their environmental behavior as well (Hirsh, 2010). Interestingly, the relevant research produced contradictory findings: while some studies showed that Conscientiousness was not related or was inconsistently related to environmental engagement (e.g. Hirsh & Dolderman, 2007; Markowitz et al., 2012), others demonstrated that this personality trait is significantly associated with environmentalism (e.g. Fraj & Martinez, 2006; Milfont & Sibley, 2012). Thus, based on the above, we may posit that:

Hypothesis 3: Tourists with a higher score on Conscientiousness are likely to exhibit more environmentally friendly behavior.

Neuroticism is associated with the tendency to experience negative affects such as anxiety, anger, irritability, fear, sadness, and insecurity (McCrae & Costa, 1985). Individuals who score high on Neuroticism are less able to control impulses, hardly cope with stress, and respond emotionally to situations that would not influence most people (McCrae & John, 1992). Although Neuroticism was found to be positively associated with environmental preservation (Wiseman & Bogner, 2003) when measured with the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975), the studies on the link between this trait and environmentalism using the Big Five yielded mixed results. For instance, Hirsh and Dolderman (2007) and Fraj and Martinez (2006) did not find any relationship between Neuroticism and ecological concerns, while Milfont and Sibley (2012) reported some inconsistent associations (Neuroticism was both positively (Study 2) and negatively (Studies 1 and 3) related to environmental engagement). Still, in another study Hirsh (2010) found that more neurotic people demonstrate significantly higher levels of ecological concern. Despite these contradictory findings, it is still logical to expect that individuals who score higher on Neuroticism are more worried about any

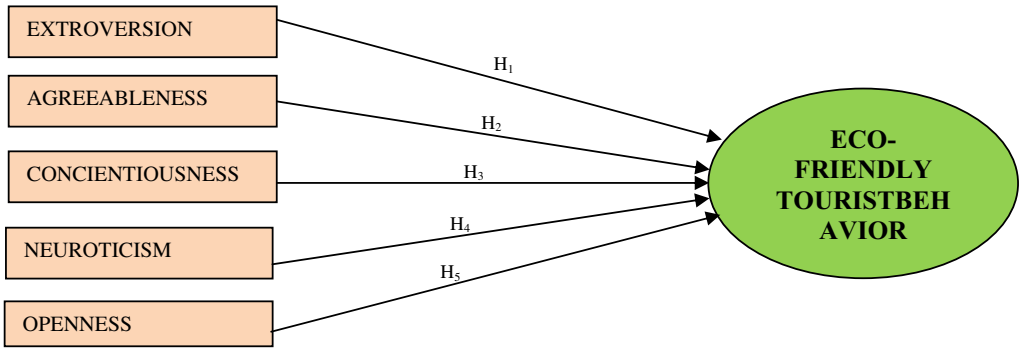

Fig. 1. The conceptual model.

phenomenon with negative consequences and therefore try not to contribute to environmental degradation (Hirsh, 2010). Given this, we may cautiously posit that:

Hypothesis 4: Tourists with a higher score on Neuroticism are likely to exhibit more environmentally friendly behavior.

Openness describes the breadth, depth, and variability of one's longing for new ideas and refers to the extent to which a person is imaginative, broad-minded, intelligent, and artistically sensitive (McCrae & Costa, 1985). Openness is also associated with aesthetic appreciation and intellectual curiosity, which might stimulate one's interest in nature and encourage environmental protection (Hirsh & Dolderman, 2007; Markowitz et al., 2012). Besides, as in the case of Agreeableness, Openness was related to Schwartz's (1992) value of Self-transcendence, which advocates, along with other values, protection of nature (Luk & Bond, 1993; Olver & Mooradian, 2003). Notably, the trait of Openness was strongly and consistently correlated with pro-environmental attitudes/behaviors in past research (Hirsh, 2010; Markowitz et al., 2012; Milfont & Sibley, 2012). For instance, the study of Markowitz et al. (2012) revealed that, at the facet level, the individuals who participate more frequently in pro-environmental activities are those who appreciate aesthetic beauty, are more innovative, and have a wider breadth of interests. Thus, based on the above, we may hypothesize that:

Hypothesis 5: Tourists with a higher score on Openness are likely to exhibit more environmentally friendly behavior.

3. Methodology

This study took place among tourists who visited the Republic of Cyprus during summer 2014. A total of 370 tourists were randomly approached, using specific quotas with regard to nationality, age, and gender. Of these, only 249 were willing to participate, resulting in the response rate of 67%. Further, some of the questionnaires were removed because of incomplete and/or inconsistent answers, and the final data set featured only 227 individuals (a valid response rate of 61%). Participants in the study represented 5 countries: Russia (26%), the UK (20%), Greece (19%), Sweden (18%), and Germany (17%). The sample consisted of 47% male and 53% female tourists; 43% were under the age of 35 and 57% were at least 35 or above; 71% held at least an undergraduate university degree, while 29% completed primary or vocational education.

The questionnaire included questions containing lists of precoded items for each of the constructs, which were measured on a seven-point Likert scale (1 = very inaccurate, 7 = very accurate). The questionnaire consisted of three main parts: (a) the Big Five traits; (b) environmental tourist behaviors; and (c) sociodemographics (nationality, gender, age, education). As for the scale development, the Big Five Traits were operationalized using the mini-IPIP, a 20-item short form of the 50-item International Personality Item Pool—Five-Factor Model measure (Goldberg, 1999), which was developed by Donnellan, Oswald, Baird, and Lucas (2006). This scale showed convergent, discriminant, and criterion-related validity with other Big Five measures (Cooper, Smillie, & Corr, 2010). The tourist behavior scale included eight items which were taken from Kaiser and Wilson's (2004) General Ecological Behavior (GEB) and adapted to the tourism context.

The questionnaire was developed in English and translated into three other languages, namely Russian, German, and Greek, to achieve reliable results in the interviews with non-English-speaking tourists. A back-translation procedure also ensured that no problem arose from the meaning of the issues raised in the questionnaire (Craig & Douglas, 2005). Before the full-scale study was launched, all questionnaire versions were pretested with tourists from different nationalities; the pretests revealed no problems with regard to duration, flow, and comprehension. Data were gathered through personal interviews with foreign tourists conducted at central locations (e.g., airports, hotels) over a 3-month period. The statements in the questionnaire were read out loud by interviewers to the participants, who expressed their opinion by choosing one of the seven alternative options (seven-point Likert scale) written on a special card shown to them. To avoid possible respondent bias, all participants were assured anonymity and confidentiality of the answers given and were told that there were no right or wrong answers for the questions asked (Chung & Monroe, 2003).

4. Analysis, findings and discussion

Based on Anderson and Gerbing's (1988) approach, the author of this article first evaluated the adequacy of measurements using a confirmatory factor analysis (CFA) and then tested the hypothesized links among the constructs by employing a structural equation modeling (SEM). The analysis was conducted using SPSS and AMOS 22.0. The means, standard deviations, and correlation matrix are shown in Table 1.

4.1. Measurement model results

To assess the validity and reliability of the scales, a measurement model was estimated (see Table 2). A confirmatory factor analysis was employed, whereby each item was restricted to load on its a priori specified factor, while the underlying factors were allowed to correlate (Anderson & Gerbing, 1988). The results of CFA provided a satisfactory fit to the data. Although the chi-square statistic was significant ($\chi^2(319) = 510.824$, $p = .00$) due to the high sensitivity of this index to sample size, all alternative fit indices were found within the commonly accepted critical levels ($\chi^2/df = 1.60$, CFI = .91, RMSEA = .05 (90% CI: .04, .06), SRMR = .06.) (Kline, 2005). Convergent validity was satisfactory, since the average variance extracted (AVE) approximated or exceeded the suggested cutoff value of 0.50 (Hair, Black, Babin, & Anderson, 2006). The estimated loadings for all the indicators were adequate and significant at $p < .001$, which further supports the convergent validity of the measures. Discriminant validity was also evident, since the square roots of all constructs' AVEs (see Table 2) were greater than inter-construct correlations (see Table 1) (Fornell & Larcker, 1981). All factors had composite reliability above .80, implying that multiple measures employed in this study were highly reliable (Bagozzi & Yi, 1988).

4.2. Structural model results

SEM was conducted to test the links between the Big Five personality traits and eco-friendly tourism using the maximum likelihood estimation method. The fit indices obtained indicated an acceptable model fit (i.e., χ^2 (317) = 530.199, $p = .00$; $\chi^2/df = 1.67$; CFI = .91; RMSEA = .06 (90% CI: .05, .06); SRMR = .06). The standardized path coefficients, together with the corresponding *t*-values, are presented in Table 3. Notably, four hypothesized relationships were statistically significant and in the expected directions (Hypotheses 1, 2, 3, and 4 are therefore accepted) and one was insignificant and in the opposite direction (Hypothesis 5 is rejected). In particular, Extraversion had a small positive effect on environmentally friendly tourism (H1: $\beta = .17$, $t = 2.36$, $p = .02$), and this is in line with some relevant studies (e.g., Markowitz et al., 2012) in general environmental literature.

Table 1
Correlation matrix and descriptive statistics.

Constructs	Tourist eco-friendly behavior	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Tourist eco-friendly behavior	1					
Extraversion	.32**	1				
Agreeableness	.47**	.48**	1			
Conscientiousness	.33	.22*	.25**	1		
Neuroticism	.22**	.09	.18*	.32**	1	
Openness	−.12	−.13	−.18*	−.18*	−.06	1
Mean score (SD)	4.17(1.14)	5.16(1.09)	5.59(.99)	5.28(1.09)	4.13(1.26)	3.97(1.20)

Notes: *Correlation is significant at the 0.05 level. **Correlation is significant at the 0.01 level.

Table 2
Results of the measurement model.

Factor	Standardized loadings***
Extraversion (EXS) (CR = .80; AVE = .50; the square root of AVE = .71)	
EXS1-Am the life of the party	.67
EXS2-Don't talk a lot	.69
EXS3-Talk to a lot of different people at parties	.71
EXS4-Keep in the background	.76
Agreeableness (AGR) (CR = .80; AVE = .51; the square root of AVE = .71)	
AGR1-Sympathize with others' feelings	.70
AGR2-Am not interested in other people's problems	.70
AGR3-Feel others' emotions	.70
AGR4-Am not really interested in others	.75
Conscientiousness (CON) (CR = .80; AVE = .51; the square root of AVE = .71)	
CON1-Get chores done right away	.80
CON2-Often forget to put things back in their proper place	.73
CON3-Like order	.68
CON4-Make a mess of things	.64
Neuroticism (NEU) (CR = .82; AVE = .54; the square root of AVE = .73)	
NEU1-Have frequent mood swings	.87
NEU2-Am relaxed most of the time	.61
NEU3-Get upset easily	.61
NEU4-Seldom feel blue	.80
Openness (OPE) (CR = .80; AVE = .51; the square root of AVE = .71)	
OPE1-Have a vivid imagination	.78
OPE2-Am not interested in abstract ideas	.62
OPE3-Have difficulty understanding abstract ideas	.70
OPE4-Do not have a good imagination	.75
Eco-friendly tourist behavior (EFB) (CR = .87; AVE = .45; the square root of AVE = .67)	
EFB1-During my visit to foreign countries as a tourist, I talk with friends about problems related to the environment	.68
EFB2-During my visit to foreign countries as a tourist, I buy/read magazines and listen/watch news which focus on environmental issues	.68
EFB3-When I visit foreign countries as a tourist, I avoid buying goods with unnecessary packaging material	.81
EFB4-During my visit to foreign countries as a tourist, I buy environmentally friendly products, whenever possible	.66
EFB5-I reduce and recycle waste, whenever possible, during my visits to foreign countries as a tourist	.64
EFB6-As a tourist, I always like to visit environmentally friendly countries	.71
EFB7-When I visit foreign countries as a tourist, I try to minimize my consumption of water and energy	.60
EFB8-When I visit foreign countries as a tourist, I choose means of transportation with the least ecological footprint	.55

Fit statistics: chi-square (χ^2) = 510.824; *df* = 319; ratio chi-square to *df* (χ^2/df) = 1.60; comparative fit index (CFI) = .91; root mean squared error of approximation (RMSEA) = .05 (90% CI: .04, .06); standardized root mean square residual (SRMR) = .06.
*** p = .000.

However, other studies on this subject (e.g. Hirsh, 2010; Hirsh & Dolderman, 2007) found no association between Extraversion and eco-friendliness. This discrepancy could be explained by the fact that Extraversion is related differently to non-behavioral and behavioral types of environmentalism. Besides, past research indicated a significant positive relation between the activity facet of Extraversion and environmental consciousness (Markowitz et al., 2012), and since individuals in the tourist sample are likely to have higher activity levels than the general population, the association between this personality trait and eco-friendliness appears to be stronger for them. Thus, the use of the tourist sample may also account for the difference between present and past findings.

Agreeableness proved to be the strongest driver behind the development of eco-friendly actions in the tourism context (H2: β = .31, t = 3.87, p = .00). It appears to fit with past inquiries that aimed to verify this association in more general contexts (e.g., Fraj & Martinez, 2006; Hirsh, 2010; Milfont & Sibley, 2012). Thus, warm and considerate individuals who feel concern for other people tend to extend their caring attitude and behavior to the natural environment. Conversely, egoistic and uncooperative individuals who are not willing to compromise their interests with others are unlikely to participate in pro-environmental activities (Hirsh & Dolderman, 2007). Notably, Milfont and Sibley (2012) argue that a pro-social component of environmentally friendly individuals is driven by their Agreeableness and self-transcendence values.

Conscientiousness also played an important role in explaining the formation of environmentally conscious behaviors among tourists (H3: β = .25, t = 3.06, p = .00). Although these results do not confirm the findings of few past studies (e.g. Markowitz et al., 2012), they are consistent with the majority of recent examinations in general environmental research (e.g. Fraj & Martinez, 2006; Hirsh, 2010; Milfont & Sibley, 2012). These findings imply that dutiful, self-disciplined, and purposeful tourists (i.e. high on the trait of Conscientiousness) are more likely to exhibit eco-friendly behavior. Their pro-environmental actions could be encouraged by such facets of Conscientiousness as adherence to social rules and norms (including environmental ones), concern for future outcomes (including ecological ones), and feelings of responsibility and obligation (Milfont et al., 2012).

Table 3
Results of the structural model.

H	Hypothesized association	Standardized estimate	t-Value	p-Value	Status
H_1	Extraversion → eco-friendly tourist behavior	.17	2.36	.02	Accepted
H_2	Agreeableness → eco-friendly tourist behavior	.31	3.87	.00	Accepted
H_3	Conscientiousness → eco-friendly tourist behavior	.25	3.06	.00	Accepted
H_4	Neuroticism → eco-friendly tourist behavior	.15	2.10	.04	Accepted
H_5	Openness → eco-friendly tourist behavior	−.01	−.11	.35	Rejected

Fit statistics: chi-square (χ^2) = 530.199; p = .000; *df* = 317; ratio chi-square to *df* (χ^2/df) = 1.67; comparative fit index (CFI) = .91; root mean squared error of approximation (RMSEA) = .06 (90% CI: .05, .06); standardized root mean square residual (SRMR) = .06.

In addition, Neuroticism positively influenced tourist pro-environmental behavior, albeit with a smaller effect size (H4: $\beta = .15$, $t = 2.10$, $p = .04$). This is an interesting finding, since it indicates that anxious, unstable, and prone to stress individuals are likely to make more environmentally friendly tourists. Although these results do not fit with the most previous research on this subject (e.g., Fraj & Martinez, 2006; Milfont & Sibley, 2012), several other studies (e.g., Hirsh, 2010; Wiseman & Bogner, 2003) also found small but significant positive association between Neuroticism and environmentalism. This association could be attributed to the fact that more neurotic individuals tend to respond more emotionally to all kinds of negative scenarios (including increasing environmental degradation), and therefore aim to minimize their occurrence (Hirsh, 2010).

Most surprisingly, contrary to all the past studies (e.g. Fraj & Martinez, 2006; Markowitz et al., 2012; Milfont & Sibley, 2012), Openness was negatively and insignificantly related to eco-friendly tourist behavior (H5: $\beta = -.01$, $t = -.11$, $p = .35$). Notably, imagination and intellect (two main components of Openness) had the opposite effects on eco-friendliness: while imagination was correlated negatively, intellect was correlated positively. One possible explanation for these negative relations could be the use of the tourist sample, since unconventional tourists who are open to new ideas and experiences might bring damage to environment in the course of such experiences (e.g. climbing the cliff, safari, using water scooters, etc.). Notably, high-Openness individuals might behave in an environmentally friendly way at home (in accordance with the previous studies) but exhibit ecological myopia on vacation. This could be attributed to the fact that environmental behavior in a household setting is mainly determined by normative motives (“to act appropriately”), while the strongest drivers of such behavior in a tourism setting are hedonic motives (“feel better right now”) (Miao & Wei, 2013). Overall, these contradictory relationships at the facet level could have offset one another, resulting in the absence of association at the domain level.

5. Conclusions, implications, future directions

This study examined the relationship between the Big Five and eco-friendly tourism in a sample of 227 tourists. The findings showed that personality plays an important role in shaping tourist eco-friendly behavior. This study contributes to the environmental psychology literature in three ways: (a) it is the first study in the tourism context that tests a link between the Big Five and eco-friendliness and reveals some differences in these associations between household and hospitality settings; (b) it is one of the few studies that examines how personality is related to actual environmental behavior (as opposed to environmental beliefs, norms, attitudes, and intentions); (c) this research provides some fresh insights into the relationships that have previously been found contradictory and inconsistent and could serve as a useful framework for further investigations into this subject.

Apart from advancing our knowledge on the profile of an eco-friendly tourist, the findings of this study may hold important implications for green hotels, airlines, tourism agencies, etc. One of the main target markets for such organizations are environmentally conscious consumers, and, given the established links between the Big Five and eco-friendly tourism, particular marketing stimuli could be used in relevant environmental campaigns. For instance, the association between eco-friendliness and Extraversion should encourage marketers to stress Extraversion-related facets (activity, excitement-seeking, gregariousness), while the association between environmental consciousness and Agreeableness calls for emphasizing Agreeableness-related facets (altruism, cooperation, good ‘citizenship’). Similarly, focus on competence, order, high achievement (e.g., the ranking of a hotel), and compliance with laws would appeal to conscientious consumers. Finally, emphasis on the dramatic consequences of environmental degradation could be very persuasive for neurotic individuals. Overall, green tourism-related companies need to thoroughly consider personality traits of their target audiences (as well as previously established determinants of eco-friendliness such as values, norms, attitudes) when creating promotional messages.

While this study clearly adds to the growing body of research on the link between personality and tourists’ environmentalism, it has some limitations that can serve as suggestions for future research. Firstly, a shortened 20-item mini-IPIP scale did not allow for assessment of lower-order personality traits, and future research could utilize more traditional and rigorous measurements of the Big Five to verify these results. Secondly, contradictory facet-level relations in certain domains of the Big Five call for further research on the association between eco-friendly tourism and lower-order personality traits (rather than higher-order, broad factors). Thirdly, this research employed self-reported measures which could have resulted in social desirability bias. Future studies would therefore benefit from using more objective measures (e.g., peer reports) of tourists’ personality and behavior. Finally, this study examined the link between personality traits and eco-friendly behavior at a single point in time. Meanwhile, eco-friendliness and its relation to personality might significantly evolve over time, and longitudinal investigation could provide additional insights into this subject.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.paid.2015.04.011.

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