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# **Personality traits and associations with pro-environmental and economically-relevant behaviors: A brief overview of research evidence**

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## **Abstract**

The current review aims to briefly (1) examine the relationship between personality traits and pro-environmental behaviors, considering the role of attitudinal and other psychological factors like concern, and (2) explore how personality variables are associated with economic choices in the context of environmental preference, especially willingness to pay (WTP) for environmental goods and services. Overall, the results highlight the importance of personality dimensions in understanding and predicting pro-environmental actions and intentions, including WTP. Personality traits play a significant role in explaining variations in environmental concern and sustainable behaviors. Agreeableness and openness have emerged as reliable indicators of individual environmental considerations. Agreeableness reflects empathy and concern for others, while openness is associated with increased environmentally conscious behavior. Neuroticism and conscientiousness have also been linked to environmental concern, but their impact may be influenced by contextual factors. Personality research enhances researchers' understanding of individual variations in economic behavior, providing more comprehensive explanations for individuals' choices and values. Understanding the impact of personality on stated preferences can enhance our comprehension of the variations in acceptance of environmental improvement policies among individuals, shed light on the distribution of benefits and costs across different personality types, and identify potential challenges in implementing these environmental improvements due to behavioral factors. Research on personality and environmentalism needs to expand to advance our understanding environmental behaviors and economic choices.

**Keywords:** Personality; Pro-environmental Behavior; Economically Relevant Behavior; Environmental Concern.

## 1. Introduction

### *1.1. Pro-environmental behavior, monetary preferences for conservation, and personality dimensions*

Pro-environmental behavior has been the focus of numerous studies in the environmental domain and the vast majority of existing research relies on the predictive power of multiple psychological constructs like attitudinal considerations, values, beliefs, and norms (i.e. Gkargkavouzi et al., 2019; Li et al., 2019) however, personality dimensions have not been systematically addressed in the environmental literature. The study of personality traits can help gain further insight into people's pro-environmental attitudes and actions and thus, underpin global sustainability efforts.

Much of the research to date on environmental behavior has focused on narrower dimensions of personality, such as those found in the Five-Factor Model (FFM) (John & Srivastava, 1999; Paunonen & Jackson, 2000; Ashton & Lee, 2001), which may neglect the full range of human personality traits. Predicting pro-environmental tendencies via personality requires analyzing the connections among pro-environmental attitudes, values and behaviors, and other existing frameworks (Simpson et al., 2021), including the Supernumerary Personality Inventory (SPI; Paunonen & Jackson, 2000), hope - which is a stable individual difference characteristic-, and the HEXACO model (Lee & Ashton, 2009).

Additionally, works on the interplay between personality traits and willingness to pay for environmental goods and services are scarce. Economists have advocated for the incorporation of personality study into economic research, both in terms of theory and empirical analysis (Rustichini et al., 2016). Boyce et al. (2016) argue that personality traits play a significant role in determining people's loss aversion and their subjective well-being in response to income gains and losses. Personality has important implications for the behavioral sciences; however, most economists are not acquainted with personality studies and lack knowledge on how to quantify personality. The absence of validated personality measures in commonly used large household panel surveys has hindered the integration of personality measures into a broader economic framework. Personality is an effective method for examining variations in preferences when assessing the value of environmental goods (Boyce, et al., 2019).

## ***1.2. Study objective and Structure***

The primary objectives of this study are as follows:

1. Examine the correlation between different types of pro-environmental behavior and personality traits measured by traditional (Big-Five Model) and alternative or extended models (i.e. Supernumerary Personality Inventory, hope construct, HEXACO model, Revised NEO Personality Inventory),
2. Explore the role of attitudinal and other psychological factors like concern on the personality-behavior relationship,
3. Find evidence on how personality variables are associated with economic choices in the environmental literature, especially in the context of the stated preferences.

The paper is structured as follows: First, we review research evidence on the Personality and Pro-environmental Behavior relationship, and then, we analyze literature on how personality characteristics are correlated to economically relevant behaviors; the final section presents some concluding remarks, policy considerations, and suggestions for future research.

## **2. Research Evidence**

### ***2.1. Personality and Pro-environmental Behavior***

#### ***2.1.1. Brief Overview of Personality Traits***

People vary in enduring psychological traits (Eysenck & Eysenck, 1985). These distinctions have been formulated and categorized at multiple levels, ranging from overarching tendencies of approach and avoidance motivation to diverse classifications of personality traits (Elliot & Thrash, 2002; Brick & Lewis, 2016). Extensive research in the field of personality structure and assessment provides substantial evidence for a descriptive theory that identifies five distinct and consistently observed personality qualities. According to the "Big Five" model of personality, Neuroticism (or Emotional Stability in its positive pole), Agreeableness, Conscientiousness, Openness to Experience, and Extraversion are the five domains of personality traits (or OCEAN acronym).

Depression, anxiety, rage, and insecurity are all symptoms of neuroticism. This aspect of character typically reveals a keener eye for indications of acceptance or rejection from those with whom one has strong ties (Soutter et al., 2020). People who

are high on the Agreeableness quotient are those who are easy to get along with, who work well with others, and who worry deeply about the happiness of their loved ones. This trait is indicative of a willingness to put more effort into mutually beneficial social relationships, but it also makes one more vulnerable to being taken advantage of. Those who are conscientious tend to be meticulous, accountable, and well-organized. When a larger investment in long-term planning leads to better outcomes, this factor can help maximize those advantages.

However, it might waste time and resources if it's applied in situations where benefits could be maximized without extensive preparation in the first place. Intelligent, creative, and actively involved in ideas-related activities, are the hallmarks of an open mind (Hirsch, 2014). Those who perform well on this indicator tend to have open minds and accept others as they are. This metric is indicative of time and effort spent on the pursuit of fresh solutions and gains, but it also carries the risk of trying out novel behaviors with potentially costly side effects, especially in risky situations. Finally, those who rank higher on the Extraversion scale are more likely to be friendly and outgoing. Those people also tend to maximize gains from social relations, though doing so may require a greater investment of time and energy to effectively interact with others (for a general review of the proposed cost-benefit trades-offs in balanced selection pressures that have resulted in these core dimensions of personality, see Ashton & Lee, 2007; Nettle, 2006).

Another model, the HEXACO, developed by Ashton and Lee in 2007, renames Neuroticism as "Emotionality", however, Emotionality and Neuroticism are not synonymous (Lee & Ashton, 2004). Additionally, the HEXACO model introduces a sixth fundamental trait called Honesty-Humility, which encompasses honesty, fairness, avoidance of greed, and modesty. Honesty-Humility exhibits covariance with Agreeableness and Conscientiousness, as defined in the Big Five models. Its distinct inclusion as an independent component provides valuable and distinctive personality variance in the prediction of attitudes and behavior. The trait of Honesty-Humility is a strong predictor of active collaboration, whereas Agreeableness does not have the same predictive power. Conversely, Agreeableness is a strong predictor of non-retaliation, while Honesty-Humility does not have the same predictive power (Hilbig et al., 2013).

Paunonen and Jackson (2000) discovered that the Big Five personality traits fail to adequately capture up to 10 dimensions. Paunonen (2002) developed the SPI, a

measurement tool for 10 specific traits. These traits include religiosity (devotion to a higher power), manipulativeness (ability to influence others for personal gain), integrity (adherence to and expectation of high standards of behavior), seductiveness (behavior to attract romantic partners), thriftiness (using resources only when necessary), conventionality (desire to maintain traditions), femininity (submissiveness, sympathy, tenderness), egotism (self-importance), humorousness (ability to create and respond to amusement), and risk-taking (willingness to expose oneself to potential harm). For detailed definitions of the traits, refer to Veselka et al. (2011) and the extended SPI scale.

Moreover, the Big Five and HEXACO domains represent a single tier within the classification of personality traits. Each of these domains can be subdivided into features. While there is ongoing debate about the precise configuration of facets, various authors have put forth different proposals (Condon, 2018; Soto & John, 2017). However, the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) has gained significant popularity for its implementation of a 30-facet solution, with six facets corresponding to each of the Big Five domains. Facets encompass a significant quantity of distinctive information regarding the various ways in which individuals differ in personality, surpassing the categories in which they are classified (Soutter & Möttus, 2020).

### 2.1.2. Literature on Personality, Pro-environmental Behaviors, and other psychological factors mediating their interrelationship.

A significant body of research has examined how personality traits predict engagement in pro-environmental behaviors. The most robust findings concern the positive influence of pro-environmental attitudes, openness to experience, extraversion, conscientiousness, and agreeableness (Markowitz et al., 2012). Openness to experience – reflecting imagination, curiosity, and willingness to try new things – also consistently predicts pro-environmental actions, likely because these individuals are more receptive to learning about and adopting environmental behaviors (Markowitz et al., 2012). However, some studies find non-significant or even negative relationships between these traits and pro-environmentalism, warranting further investigation (Markowitz et al., 2012).

Hirsch and Dolderman (2007) tested 106 University of Toronto to see whether they could find a correlation between the Big Five personality characteristics,

environmentalism, and consumerism. The Big Five personality traits are strong predictors of both Consumerism and Environmentalism. More precisely, Agreeableness had a negative correlation with Consumerism, whereas both Agreeableness and Openness had a positive correlation with Environmentalism. These findings can be understood as specific examples of the correlations between higher-order traits and values that have been identified in previous research. Specifically, Agreeableness and Openness had a positive correlation with the overarching value of self-transcendence, while displaying a negative correlation with the overarching goal of self-enhancement. Both Agreeableness and Openness independently contribute to the overall variability in Environmentalism, thus, the impact of Openness might be separate from the empathy-related effects of Agreeableness. Personality traits had the greatest predictive power when it came to determining specific pro-environmental objectives and the degree to which individuals incorporate nature into their self-concept.

Nisbet et al. (2009) looked at how the Big Five dimensions were connected to a measure of natural relatedness (NR scale) in 2 independent samples of adults and students. Both samples showed favorable associations between agreeableness and openness and a desire to spend time in nature, corroborating earlier research.

Hirsh (2010) collected and analyzed longitudinal data from a sizable German community sample (N = 2690). There was a positive correlation between increased environmental concern and elevated levels of the Big Five personality qualities of Agreeableness and Openness. Both Agreeableness and Openness have been associated with the elevated personal value of self-transcendence, which indicates a broadened perception of oneself and a heightened consideration for others. Agreeableness was positively associated with heightened levels of empathy, which is believed to bolster pro-environmental motivations. Individuals with lower levels of Agreeableness typically exhibit more self-centered behavior and display less care for the well-being of others. Openness, on the other hand, was linked to enhanced cognitive capacity and adaptability in thinking, which may provide a wider understanding of humanity's role in the broader ecosystem and a heightened aesthetic admiration for natural beauty. Less open individuals tend to have a more limited and traditional viewpoint of the significance of nature, while persons with higher degrees of neuroticism have much greater levels of concern for the environment. The trait of

conscientiousness exhibited a modest yet noteworthy correlation with environmental concern, indicating a favorable relationship.

Milfont & Sibley (2012) conducted three sequential studies in the New Zealand population to compare the individual and national-level personality factors associated with environmental participation. The Big Five personality traits were identified as strong predictors of environmental engagement in two separate national probability samples, as well as in a study that analyzed country-level scores. The primary personality traits anticipated to be linked with environmental participation were Agreeableness, Conscientiousness, and Openness to Experience. The results corroborated these hypotheses in all three investigations. The three Big Five personality traits exhibited a consistent positive correlation with various measures of environmental engagement. These measures included the environmental value of 'protecting the environment', self-reported data on past electricity conservation behavior, country-level scores of sustainability index, environmental attitudes and concern, and harmony values. Notable correlations with Extraversion were also found when analyzing data at the country level, while the correlations with Neuroticism were less consistent.

Lee et al. (2015), within a group of 324 undergraduate students, found that the concepts of Connectedness to Humanity (CH) and Connectedness to Nature (CN) pertain to individuals' attitudes toward two seemingly distinct entities: the human race and the natural world. However, these constructs exhibited a positive correlation and had the Openness to Experience and Honesty-Humility components as their main personality correlates. Furthermore, there were notable correlations between pro-environmental and pro-animal attitudes and behaviors and the aforementioned personality traits measured via the HEXACO Personality Inventory. These associations were predominantly influenced by CN, with a minor influence from CH.

Brick & Lewis (2016) employed a particular form of environmental behavior, namely the reduction of greenhouse gas emissions, to determine the personality traits that are most strongly linked to behavior. They examined whether attitudes mediate the effects of these traits. Using a sample of 345 adults from the United States, representative in terms of age and gender, examined the relationship between emissions-reducing behaviors, personality traits measured by the 100-item HEXACO personality inventory, and environmental and political attitudes. The results showed that Openness, Conscientiousness, and Extraversion were the personality traits that



most strongly predicted emissions-reducing behaviors. Furthermore, these effects of personality were influenced by individuals' attitudes towards the natural environment.

Poškus & Žukauskienė (2017) focused on the recycling behavior of adolescents, focusing on their self-reported actions. The findings revealed that adolescents with different personality types have distinct approaches to recycling. Individuals with higher levels of adaptive and positive personality traits exhibit more favorable views towards recycling and are more actively involved in recycling compared to individuals with lower levels of adaptive qualities. By examining models that are built on the theory of planned behavior, the authors were able to identify subtle variations in the linear connections between the variables of the model across different clusters. The positive cluster exhibited good features in both personality and sustainability, since it is characterized by adaptable personality traits and strongly positive norms and attitudes towards recycling. The negative cluster demonstrated elevated levels of neuroticism and diminished levels of extraversion, suggesting that individuals within this cluster may be susceptible to interventions that promote recycling behavior and offer recycling opportunities, thereby enhancing both actual and perceived behavioral control. Individuals in the agreeable and closed cluster did not derive their intentions from their attitudes. Their recycling intention was minimally influenced by their personal norms and perceived behavioral control.

Marcus & Roy (2019) conducted two studies to evaluate the influence of core values and personality factors on a wide range of sustainability actions, including both positive and negative behaviors, inside the workplace. Findings from a study with a group of 411 students and another study including a group of 639 Canadian individuals verified that values and personality are separate concepts that gradually and uniquely influence economic, social, and environmental results. When accounting for values, the personality trait of Honesty-Humility is the most powerful negative indicator of harmful behaviors. Their findings differed from previous studies as they indicated that Agreeableness has a minimal effect on work-related sustainability actions, while Extraversion exhibited the highest positive correlation with all forms of beneficial actions.

Shen et al. (2019) investigated the impact of personality traits and demographic factors on energy conservation behavior. Conscientiousness exhibited the highest level of consistency in its positive link with energy conservation behavior. The results indicated an association between agreeableness and behaviors related to

energy conservation efforts in the family, such as the usage patterns of home appliances including air conditioners, water heaters, and lighting. The frequency of attempts to convince others to engage in pro-environmental behavior was positively correlated with openness. These two individual characteristics influenced distinct parts of energy conservation behavior. There was a favorable association between household monthly income and energy conservation behavior. Nevertheless, no substantial correlation was observed between gender, age, and other Big Five personality traits and energy conservation behavior.

Soutter & Mõttus (2020) investigated if aspects offer a more comprehensive understanding of the relationship between pro-environmental attitudes and behaviors and personality traits, in addition to the Big Five domains. The researchers also investigated whether providing information at the level of individual facets yielded a higher predictive accuracy for pro-environmental attitudes and behaviors, as compared to providing information at the level of broader domains. Among the dimensions, Openness exhibited the highest correlation with pro-environmental attitudes and activities, followed by Agreeableness and Conscientiousness. There was no significant correlation between extraversion and pro-environmental sentiments, but there was a strong correlation between extraversion and pro-environmental behaviors. Neuroticism and pro-environmental opinions or actions did not show significant associations. All aspects of Openness were found to have a positive relationship with pro-environmental attitudes and behaviors. Similarly, all aspects of Conscientiousness were positively correlated, while specific aspects of Agreeableness (Morality, Altruism, Cooperation, Modesty, and Sympathy) had a significant relationship with pro-environmental attitudes and behaviors.

Soutter et al. (2020) performed a meta-analysis to capture the interactions between the Big Five and HEXACO personality traits and pro-environmental attitudes and behaviors. The study incorporated 38 sources, with a total sample size of 44,993 participants. The findings revealed that openness and honesty-humility were the most significant factors associated with pro-environmental attitudes and behaviors. Pro-environmental attitudes and behaviors were found to be positively correlated with agreeableness, conscientiousness, and, to a lesser degree, extraversion. The variation in effect sizes was partially accounted for by the gender ratio, age, and place of origin of the samples, as well as by the personality model. The results also showed occasional and modest publication bias, which was statistically significant. The meta-

analytic connections yielded significant prediction accuracy for pro-environmental attitudes and behaviors in separate holdout groups.

Hopwood et al. (2021) used data from 58,748 individuals in Germany to examine changes in personality traits that are linked to growing environmental concerns. Consistent with prior investigations, there was a correlation between personality qualities and environmental concerns. The rise in concern was correlated with an increase in the personality qualities of neuroticism and openness to experience. Alterations in personality traits correspond to modifications in environmental attitudes and behaviors. Individuals who experienced a gradual increase in neuroticism also demonstrated a commensurate rise in their level of environmental concerns. There was no significant relationship between agreeableness and concerns about climate change in terms of their development together. Additionally, the study did not find any connections over time between environmental concerns and conscientiousness.

Simpson et al. (2021) explored the influence of hope and personality qualities that go beyond the Five-Factor Model (FFM) framework on the prediction of environmental values and practices. There were modest positive associations observed between environmental values and behaviors related to integrity and femininity, while negative associations were seen with religion. The findings indicated a scarcity of evidence supporting the predictive power of the examined personality traits concerning pro-environmental values and behaviors. The literature supports the notion that there is a limited but positive correlation between integrity and ecological values and actions. This aligns with the existing understanding that integrity and honesty-humility are closely related and that the latter is linked to environmental concerns.

Wang et al. (2021) studied the influence of personality qualities on individuals' intentions to conserve household energy. This was done by examining the relationship between the Big Five personality traits and household energy conservation intentions using the Theory of Planned Behaviour (TPB). The analytical findings suggested that, with the exception of Extraversion, the remaining four personality qualities influence intentions for household energy saving through distinct methods. Agreeableness and Openness exhibited positive associations with all three TPB variables. Conscientiousness positively correlated to perceived behavioral control, but Neuroticism solely showed a negative relationship with attitude. This work integrated personality factors with the Theory of Planned Behavior to examine

the intentions of individuals to conserve home energy. The results offered a small amount of empirical information regarding the connections between personality types and pro-environmental behaviors in northwest China.

Degnet et al. (2022) aimed to gauge the level of environmental awareness among 226 non-industrial private forest (NIPF) owners in Sweden, and specifically, to examine the substance and structure of the environmental concern concept among forestry owners, and establish the relationship between the environmental concern of forest owners and their values and personality characteristics. Personal values and personality factors contribute to the understanding of environmental concern in the forest management practices of non-industrial private forest (NIPF) owners. Their investigation demonstrates that the incorporation of personal beliefs and personality traits greatly enhances the accuracy of predicting environmental concern, surpassing a model that just relies on socio-demographic data. Both personal values and personality features contribute to the understanding of environmental concern among non-industrial private forest (NIPF) owners in their management and planning of forests. Personal values exerted a greater influence on concern than personality factors. The impact of personal values and personality traits on environmental concern differs significantly between the two dimensions. Specifically, only the value of universalism positively influences both environmental strategy and environmental orientation, suggesting its importance in both dimensions of environmental concern.

Duong (2022) investigated how the Big Five personality traits influence green consumption behaviour and how they help bridge the gap between attitudes, intentions, and actual ecologically friendly consumption. Additionally, the study explored gender variations in these relationships. Green consumption was substantially correlated with personality characteristics such as agreeableness, conscientiousness, openness to experience, and neuroticism, in addition to extraversion. Furthermore, the association between individuals' disposition towards eco-friendly goods and their willingness to purchase environmentally conscious products was found to be significant in elucidating customers' pro-environmental conduct. Furthermore, there was a discernible discrepancy in how personality factors influenced the level of environmentally-friendly consumption between men and women. The study revealed that the Big Five personality traits have distinct and significant influences on attitudes towards green consumption and the intention to engage in pro-environmental consumption.

Hidalgo-Crespo et al. (2023) assessed the pro-environmental behaviors of Ecuadorian residents, specifically their waste prevention, green consumerism, and avoidance habits. The research utilized the Value-Belief-Norm theory, which was expanded to include external influences. Additionally, the study explored the relationship between these behaviors and several personality factors measured by the Big Five personality test. Ecological personal norms had a beneficial impact on all three pro-environmental behaviors examined across all personality characteristic groups. Nevertheless, the correlation between avoidant behavior and personal norms exhibited minimal  $\beta$  values across all five personality traits. This personality attribute is mostly influenced by personal norms, which serve as the most effective motivators for waste prevention and green consumer behaviors. An affirmative correlation was found between neuroticism and pro-environmental behavior, while agreeableness was linked to all three pro-environmental behaviors. The personal norms of individuals with openness, conscientiousness, and agreeableness personalities were influenced and predicted to a similar extent by their knowledge of consequences and sense of responsibility.

## ***2.2. Personality and economically-relevant behaviors***

Although outside the environmental domain, the work by Grebitus et al. (2013) is important in economic psychology research. The researchers employed the Midlife Development Inventory (MIDI) scale to assess the Big Six personality qualities of 196 German individuals who took part in both real and hypothetical choice experiments and auctions. The Big Six personality model incorporates agency as the sixth personality domain. This domain is linked to individuals' inclination to exhibit strength and authority, which is represented by a specific element of extraversion known as assertiveness in the Big Five Model (BFM). The findings demonstrated that the impact of personality domains on individuals' appraisals varied across the actual and hypothetical contexts. The researchers inferred that individuals with similar personality types exhibit distinct behaviors in hypothetical and real situations, indicating that personality variables account for at least a portion of the observed hypothetical bias. Hence, consumer personality accounts for a substantial proportion of the hypothetical bias. Personality exerts a greater influence on behavior in choice experiments compared to auctions. Additionally, specific personality traits exhibit distinct behaviors in real and hypothetical situations.

Soliño and Farizo (2014) utilized a shortened version of the Big Five Inventory (BFI-10), consisting of 10 items, to ascertain the five personality domains of 2,224 Spain residents. These individuals took part in a discrete choice experiment that aimed to measure the social worth of a forest management program. The findings indicated that individuals with high levels of openness to experience and extraversion are more inclined to select the option of executing the environmental program. Conversely, individuals with elevated levels of neuroticism and agreeableness are less inclined to favor the adoption of the program. The researchers inferred that the Big Five personality traits significantly influence the decisions made by participants in the survey, and that personality is correlated with individual preferences for this specific environmental initiative.

Shen, Cui & Fu (2015) proposed an opinion dynamics model for energy conservation to comprehend the dynamics of normative feedback. The model aimed to assess how personality qualities impact behavioral change and study the mechanism of information transmission in different normative feedback structures and standards. The findings confirmed the influence of personality on residents' adoption of energy-saving behaviors, categorizing residents into six personality types based on simulation results (extremely resolute believers, traditionalists, adaptive people, easy-going people, socially outgoing people, and altruists) obtained from a modified opinion dynamics model, and importantly. Clustering of individuals' energy actions is influenced by the personality characteristic of openness, within the context of normative feedback in a community-level simulation.

Farizo et al. (2016) conducted an experiment to examine if individuals' personality traits influence their choices among several options for power generation from wind farms. A 240-item questionnaire was administered to respondents in a stated preference study regarding their preferences for the site of wind farms in Spain. The researchers discovered that certain ranges of expressed preference were influenced by personality variables. Nevertheless, the authors fail to formulate any empirically verifiable predictions based on the psychological literature regarding which features of the decision scenarios are most likely to be influenced by specific personality qualities. The findings indicated a correlation between individuals' choices and their personal characteristics, specifically their personality traits as measured by the Big Five model (neuroticism, agreeableness, extroversion, openness to experience, and conscientiousness). These results were obtained by considering factors other than

the usual covariates such as income and age. The comprehensive nature of the big five qualities makes them insufficient to fully describe the specific behavior related to environmental public choices. Therefore, we have chosen to utilize factor analysis, which allows us to identify combinations of traits that are more relevant in understanding this behavior. Utilizing factor analysis enabled us to effectively handle a substantial volume of data (240 items), which would have been unfeasible otherwise. The 240 components were condensed into around 30 facets, rather than being categorized according to the main five qualities.

In their study, Mariel and Meyerhoff (2016) examine the influence of impulsiveness, a component of neuroticism, on individuals' preferences for potential alterations to rural landscapes in Germany. They discover that differences in impulsiveness play a role in explaining variations in these preferences, specifically by affecting the likelihood of selecting the status quo option. Nevertheless, their study does not investigate any other indicators of personality.

Busic-Sontic et al. (2017) studied the extent to which personality factors influence the choice to invest in energy efficiency within the residential sector in the United Kingdom. Additionally, they investigated if the Big Five personality traits might elucidate the reasons behind the divergent choices made by individuals in investing in energy-saving measures, despite having essentially comparable financial circumstances. The findings indicated that personality traits had an indirect impact on high-cost energy efficiency investments, specifically through the mediating factors of environmental views and risk preferences. Nevertheless, adopting inexpensive environmentally friendly behaviors, such as energy conservation and purchasing eco-friendly products, is influenced only by one's environmental attitude, rather than by their risk preference. This aligns with the notion that these routine decisions entail significantly less financial jeopardy compared to a costly energy efficiency project. The results pointed out that personality qualities can hinder efforts to decrease energy usage in residential areas, emphasizing the necessity for developing relevant products and policies.

In their study, Morey & Thiene (2017) assessed the leisure preferences of dedicated mountain bikers, specifically focusing on the attributes of the trails they like. The authors assess personality traits across three dimensions: competition, sensation-seeking, and extraversion. An individual's score on these three axes is utilized to probabilistically assign that person to various latent preference classes. The

selection of a recreational site for mountain biking is determined by a combination of site factors and an individual's personality qualities. They concluded that personality variables influence how site characteristics and the capacity of your companion to describe where and with whom you go mountain biking interact. Preferences for mountain bike rides are influenced, to some extent, by factors such as the desire for excitement or prudence, the preference for competition against others or oneself, and the level of introversion. Personality factors are likely to explain various forms of recreational activities.

Boyce, Czajkowski & Hanley (2019) examined the effects of personality on individual economic choices over public environmental goods using a stated preference approach. They examined the potential for personality traits to explain preference heterogeneity within an environmental policy context. Based on three data sets from three separate, independent choice modeling studies, they tested the effects of personality on preferences for a change in the status quo, for changes in environmental quality, and over the costs of investing in environmental improvement. Incorporating personality research into economic models can provide valuable behavioral insights, since it allows a previously underexplored class of influences on preference heterogeneity to be modeled, thus enriching explanations of why the demand for environmental goods varies across people. Personality plays a crucial role in understanding why people have different preferences and willingness to pay within the framework of environmental choices. The impact of personality diversity on willingness to pay (WTP) is significant.

Personality significantly influences an individual's inclination to uphold the existing state of affairs and refrain from making choices that enhance environmental well-being but come at a personal expense. Based on prior psychological studies, we hypothesized that persons with lower levels of openness to experience, higher levels of neuroticism, or higher levels of conscientiousness would be inclined to choose the existing situation. Additionally, we hypothesized that those with greater conscientiousness or lesser openness would exhibit heightened sensitivity to cost. Last, they discovered scant evidence indicating that persons with conscientious traits exhibited a higher inclination towards favoring the existing state of affairs.

Moons et al. (2020) examined how individual differences in self-ecotourism personality impact consumer views of actual, ideal, and social self-ecotourism congruity. Additionally, it explored the influence of these beliefs on the willingness to



pay a higher price for ecotourism. The sample consisted of 1041 individuals from Flanders. The findings indicated that those who regard ecotourism as possessing a more robust sense of responsibility, emotional connection, and, to some degree, proactive nature than their personality are more likely to view ecotourism as aligning with their authentic, desired, and/or societal self. The alignment of one's actual, ideal, and social self in ecotourism leads to an increased readiness to pay a higher price for ecotourism experiences. The perception of ecotourism as having a responsible and emotional personality is diminished when the responder does not regard themselves as compatible with ecotourism in terms of their real, ideal, and social self. Furthermore, the belief that ecotourism possesses a more dynamic nature compared to the respondent's personality enhances the notion of an ideal match between oneself and ecotourism. Individuals' emotional personality variations exert the second most influential impact on their views of congruence between self and ecotourism. Self-congruity perceptions act as a mediator between the aspects of self-ecotourism personality and the readiness to pay a higher price for ecotourism.

### **3. Conclusions**

#### ***3.1. General remarks***

The foregoing results collectively lend credence to the idea that fundamental personality qualities play a significant role in explaining variations in environmental concern and sustainable behaviors (Markowitz, Goldberg, Ashton, & Lee, 2012; Hirsh, 2014; Milfont & Sibley, 2012). A significant portion of this research has concentrated on the five-factor model of personality, which delineates the diversity in personal attributes across five distinct trait dimensions.

Two personality traits—agreeableness and openness—have emerged as the most reliable indicators of environmental concern and conduct within the environmental field (Soutter et al., 2020). Individuals with a higher level of agreeableness typically exhibit more empathy and compassion, while those with a lower level of agreeableness tend to be more selfish and antisocial (Hirsh, 2014). The correlation between Agreeableness and environmental concern is in line with studies that indicate altruistic considerations as a significant aspect of pro-environmental sentiments. Highly conscientious individuals tend to be more dutiful, organized, and disciplined, supporting consistent sustainable actions. Agreeableness reflects empathy

and concern for others, which can translate into eco-friendly behaviors that benefit the greater good.

Additionally, research evidence confirms that higher levels of Openness are associated with increased environmentally conscious behavior, while both Agreeableness and Openness have an impact on how much the natural world is seen as a component of one's self-concept. Although Neuroticism and Conscientiousness have also been linked to environmental concern, the evidence for these associations has been inconsistent, suggesting that their impact may be influenced by contextual factors. Prior studies have established a correlation between elevated levels of the personality qualities of Agreeableness and Openness and a heightened level of care over environmental matters. Although these factors play a crucial role in predicting individuals' environmental attitudes, there is an increasing body of research that investigates the wider implications of population variations in personality traits.

Personality research enhances researchers' comprehension of individual variations in economic behavior (Boyce et al., 2016). Enhancing our understanding of preference heterogeneity is crucial as it allows us to provide more comprehensive explanations for individuals' choices and values across various situations. Personality is an enduring aspect of an individual's character that psychologists have discovered to be a valuable indicator of behavior. Furthermore, there are recognized and uncomplicated techniques for assessing individuals' personality traits, which can be incorporated into the survey instruments commonly used in the field of environmental economics.

Many studies emphasize the significance of personality factors in elucidating the individuals who exhibit greater concern for the environment and possess a heightened desire for environmental public goods. Agreeableness, openness, and conscientiousness each have a significant influence in influencing concerns over the environment. An examination of the impact of personality on stated preferences can enhance our comprehension of the variations in acceptance of environmental improvement policies among individuals. It can also shed light on the distribution of benefits and costs across different personality types within a population, as well as identify potential challenges in implementing these environmental improvements due to behavioral factors (Boyce et al., 2019).

### ***3.2. Policy considerations and future research***

Overall, findings highlight the importance of personality on fostering pro-environmental behaviors, attitudes, and willingness to adopt new ecological habits and support environmental conservation. It provides a roadmap for establishing policies and interventions that can lead to more sustainable and eco-conscious communities by illuminating the psychological and behavioral elements that drive pro-environmental activities. Researchers and policymakers may be able to better target their efforts and focus on personality drivers of environmental behavior.

Gaining a deeper comprehension of the factors that influence associations at the domain level might offer significant knowledge for customizing effective interventions. Understanding the factors that are likely to promote environmentally friendly attitudes and behaviors will assist us in developing more effective awareness efforts that explicitly target the acceptance of unpopular environmental legislation. Additionally, it may be beneficial to educate and engage individuals who now lack strong environmental preferences in programs of action. This approach would require tailoring interventions to make the programs more attractive to their specific personality traits. (Farizo et al., 2016). Since persons who have low levels of these characteristics are unlikely to participate in pro-environmental actions, interventions should avoid trying to inspire action by compassionate methods.

Instead, campaigns should aim to inspire action by emphasizing the tangible advantages of engaging in pro-environmental behavior, such as lower electricity bills or financial incentives for recycling, like bottle return programs. This approach is more effective because individuals who already possess a compassionate mindset are likely to be environmentally conscious and those who lack these traits are unlikely to be influenced by interventions that rely on such motivations. (Soutter & Möttus, 2020). Individuals who closely align with this particular personality profile are more susceptible to persuasion if they do not already have pro-environmental beliefs, thus making them ideal candidates for prospective treatments. Individuals exhibiting low levels of these qualities will be more resistant to influence. (Gibbon & Douglas, 2021).

An examination of the impact of personality on stated preferences can enhance our comprehension of the variations in individuals' acceptance of environmental improvement policies. It can also shed light on the distribution of advantages and

disadvantages among different personality types within a population and bring attention to potential challenges in implementing these environmental enhancements (Boyce et al., 2019). The review results reveal significant implications for modeling of expressed preferences. Choice models typically incorporate status-quo and cost variables, but personality differences can enhance these models by influencing preferences for these variables. While traditional choice models might provide an understanding of the general preferences or valuation of a group, these average impacts may be a combination of several individuals with diverse characteristics. For instance, whereas certain individuals may possess a notably high WTP, others may have a low WTP or may even require compensation. These findings may assist policymakers in comprehending the underlying motivations of individuals who oppose a proposed environmental policy change. These motivations are related to their preferences regarding the characteristics of the environmental good, the deviation from the current state, and the associated costs of the project. Additionally, it could assist policy administrators in optimizing information delivery to make it more noticeable to various respondents.

This brief review suggests that research on personality and environmentalism needs to expand as it remains limited, especially concerning economic choices in the environmental valuation field. Additional investigation is required to elucidate the reasons that people with high conscientiousness scores exhibit greater random behavior compared to those displaying a neuroticism trait, and therefore to elucidate the correlation between personality qualities and individual preferences and inclinations (Solino & Farizo, 2014).

Future research should also consider the multidimensional and complex nature of environmental behavior and shed light on how personality traits are related to activism and high-impact pro-environmental practices that exhibit an increased carbon footprint and thus, considerably undermine sustainability efforts. Extension may be in the lines of pollution and on the effect of qualitative characteristics in the production function specification (Halkos, 1993, 1994; Halkos and Bousinakis, 2017). Last, scholars should turn attention to economic choice models in environmental valuation context that will systematically incorporate personality facets and characteristics, while new models of pro-environmental behavior can emerge by incorporating personality models (Soutter et al., 2020).

## References

1. Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review*, 11, 150-166.
2. Ashton, M. C., & Lee, K. (2009). The HEXACO-60: A short measure of the major dimensions of personality. *Journal of Personality Assessment*, 91, 340-345.
3. Ashton, M.C., & Lee, K. (2001). A theoretical basis for the major dimensions of personality. *European Journal of Personality*, 15, 327-353. <https://onlinelibrary.wiley.com/doi/pdf/10.1002/per.417>
4. Brick, C., & Lewis, G. J. (2016). Unearthing the “Green” Personality: Core Traits Predict Environmentally Friendly Behavior. *Environment and Behavior*, 48(5), 635-658. <https://doi.org/10.1177/0013916514554695>
5. Basic-Sontic, A., Czap, N. V., & Fuerst, F. (2017). The role of personality traits in green decision-making. *Journal of Economic Psychology*, 62, 313–328. <https://doi.org/10.1016/J.JOEP.2017.06.012>
6. Costa, P. T., & McCrae, R. R. (1992). Four ways five factors are basic. *Personality and Individual Differences*, 13(6), 653–665. [https://doi.org/10.1016/0191-8869\(92\)90236-I](https://doi.org/10.1016/0191-8869(92)90236-I)
7. Costa, P. T., Jr., & McCrae, R. R. (1992). Four ways five factors are basic. *Personality and Individual Differences*, 13, 653–665.
8. Degnet, M. B., Hansson, H., Hoogstra-Klein, M. A., & Roos, A. (2022). The role of personal values and personality traits in environmental concern of non-industrial private forest owners in Sweden. *Forest Policy and Economics*, 141, 102767–102767. <https://doi.org/10.1016/J.FORPOL.2022.102767>
9. Duong, C.D. (2022). Big Five personality traits and green consumption: bridging the attitude-intention-behavior gap", *Asia Pacific Journal of Marketing and Logistics*, 34 (6),1123-1144. <https://doi.org/10.1108/APJML-04-2021-0276>
10. Elliot AJ, Thrash TM. Approach-avoidance motivation in personality: approach and avoidance temperaments and goals. *J Pers Soc Psychol*. 2002 May;82(5):804-18. doi: 10.1037//0022-3514.82.5.804. PMID: 12003479.

11. Eysenck, S. B. G., Eysenck, H. J., & Barrett, P. (1985). A revised version of the psychoticism scale. *Personality and Individual Differences*, 6(1), 21–29. [https://doi.org/10.1016/0191-8869\(85\)90026-1](https://doi.org/10.1016/0191-8869(85)90026-1)
12. Farizo, B. A., Oglethorpe, D., & Soliño, M. (2016b). Personality traits and environmental choices: On the search for understanding. *Science of The Total Environment*, 566–567, 157–167. <https://doi.org/10.1016/J.SCITOTENV.2016.05.053>
13. Gibbon, E., & Douglas, H. E. (2021). Personality and the pro-environmental individual: Unpacking the interplay between attitudes, behaviour and climate change denial. *Personality and Individual Differences*, 181, 111031–111031. <https://doi.org/10.1016/J.PAID.2021.111031>
14. Gkargkavouzi, A., Halkos, G., & Matsiori, S. (2019). Environmental behavior in a private-sphere context: Integrating theories of planned behavior and value belief norm, self-identity and habit. *Resources, Conservation and Recycling*, 148, 145–156. <https://doi.org/10.1016/J.RESCONREC.2019.01.039>
15. Grebitus, C., Lusk, J. L., & Nayga, R. M. (2013). Explaining differences in real and hypothetical experimental auctions and choice experiments with personality. *Journal of Economic Psychology*, 36, 11–26. <https://doi.org/10.1016/J.JOEP.2013.02.004>
16. Halkos, GE (1993). Sulphur abatement policy: implications of cost differentials *Energy Policy* 21 (10), 1035-1043 <https://www.sciencedirect.com/science/article/abs/pii/S0301421506800066>
17. Halkos, GE (1994) Optimal abatement of sulphur emissions in Europe. *Environmental and Resource Economics* 4, 127-150. <https://link.springer.com/article/10.1007/BF00692200>
18. Halkos, GE & Bousinakis, D. (2017). The effect of stress and dissatisfaction on employees during crisis. *Economic Analysis and Policy* 55, 25-34. <https://doi.org/10.1016/j.eap.2017.04.002>
19. Hidalgo-Crespo J, Velastegui-Montoya A, Amaya-Rivas JL, Soto M, Riel A. (2023). The Role of Personality in the Adoption of Pro-Environmental Behaviors through the Lens of the Value-Belief-Norm Theory. *Sustainability*, 15(17), 12803. <https://doi.org/10.3390/su151712803>
20. Hilbig, B. E., Zettler, I., Moshagen, M., & Heydasch, T. (2013). Tracing the path from personality – via cooperativeness – to conservation: Honesty-

- humility and ecological behaviour. *European Journal of Personality*, 27(4), 319–327. <https://doi.org/10.1002/per.1856>
21. Hirsh, J. B. (2010). Personality and environmental concern. *Journal of Environmental Psychology*, 30(2), 245–248. <https://doi.org/10.1016/j.jenvp.2010.01.004>
22. Hirsh, J. B. (2014a). Environmental sustainability and national personality. *Journal of Environmental Psychology*, 38, 233–240. <https://doi.org/10.1016/J.JENVP.2014.02.005>
23. Hirsh, J. B., & Dolderman, D. (2007). Personality predictors of Consumerism and Environmentalism: A preliminary study. *Personality and Individual Differences*, 43(6), 1583–1593. <https://doi.org/10.1016/J.PAID.2007.04.015>
24. John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138). New York: Guilford Press.
25. Lee, K., Ashton, M. C., Choi, J., & Zachariassen, K. (2015). Connectedness to Nature and to Humanity: Their association and personality correlates. *Frontiers in Psychology*, 6. <https://www.frontiersin.org/articles/10.3389/fpsyg.2015.01003>
26. Li, D., Zhao, L., Ma, S., Shao, S., & Zhang, L. (2019a). What influences an individual's pro-environmental behavior? A literature review. *Resources, Conservation and Recycling*, 146, 28–34. <https://doi.org/10.1016/J.RESCONREC.2019.03.024>
27. Li, D., Zhao, L., Ma, S., Shao, S., & Zhang, L. (2019b). What influences an individual's pro-environmental behavior? A literature review. *Resources, Conservation and Recycling*, 146, 28–34. <https://doi.org/10.1016/J.RESCONREC.2019.03.024>
28. Marcus, J., & Roy, J. (2019). In Search of Sustainable Behaviour: The Role of Core Values and Personality Traits. *Journal of Business Ethics*, 158, 63–79. <https://doi.org/10.1007/s10551-017-3682-4>
29. Mariel, P., & Meyerhoff, J. (2016). Hybrid discrete choice models: Gained insights versus increasing effort. *Science of The Total Environment*, 568, 433–443. <https://doi.org/10.1016/J.SCITOTENV.2016.06.019>

30. Markowitz, E. M., Goldberg, L. R., Ashton, M. C., & Lee, K. (2012). Profiling the “pro-environmental individual”: a personality perspective. *Journal of Personality*, 80(1), 81-111. <https://doi.org/10.1111/j.1467-6494.2011.00721.x>
31. Milfont, T. L., & Sibley, C. G. (2012a). The big five personality traits and environmental engagement: Associations at the individual and societal level. *Journal of Environmental Psychology*, 32(2), 187–195. <https://doi.org/10.1016/J.JENVP.2011.12.006>
32. Milfont, T. L., & Sibley, C. G. (2012b). The big five personality traits and environmental engagement: Associations at the individual and societal level. *Journal of Environmental Psychology*, 32(2), 187–195. <https://doi.org/10.1016/J.JENVP.2011.12.006>
33. Moons, I., De Pelsmacker, P., & Barbarossa, C. (2020). Do personality- and self-congruity matter for the willingness to pay more for ecotourism? An empirical study in Flanders, Belgium. *Journal of Cleaner Production*, 272, 122866–122866. <https://doi.org/10.1016/J.JCLEPRO.2020.122866>
34. Morey, E. R., & Thiene, M. (2017). Can Personality Traits Explain Where and With Whom You Recreate? A Latent-Class Site-Choice Model Informed by Estimates From Mixed-Mode LC Cluster Models With Latent-Personality Traits. *Ecological Economics*, 138, 223–237. <https://doi.org/10.1016/J.ECOLECON.2017.03.038>
35. Nettle D. (2006). The evolution of personality variation in humans and other animals. *American Psychologist*, 61(6), 622-31. <https://doi.org/10.1037/0003-066x.61.6.622>
36. Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The Nature Relatedness Scale: Linking Individuals’ Connection With Nature to Environmental Concern and Behavior. *Environment and Behavior*, 41(5), 715-740. <https://doi.org/10.1177/0013916508318748>
37. Paunonen, S. V. and Jackson, D. N. (2000). What is beyond the big five? plenty!. *Journal of Personality*, 68(5), 821-835. <https://doi.org/10.1111/1467-6494.00117>
38. Rustichini, A., DeYoung, C. G., Anderson, J. E., & Burks, S. V. (2016). Toward the integration of personality theory and decision theory in explaining economic behavior: An experimental investigation. *Journal of Behavioral and*



<https://doi.org/10.1016/J.SOCEC.2016.04.019>

39. Shen, M., Cui, Q., & Fu, L. (2015). Personality traits and energy conservation. *Energy Policy*, 85, 322–334. <https://doi.org/10.1016/J.ENPOL.2015.05.025>
40. Simpson, B., Maguire, M., & Schermer, J. A. (2021). Predicting pro-environmental values and behaviors with the supernumerary personality inventory and hope. *Personality and Individual Differences*, 181, 111051–111051. <https://doi.org/10.1016/J.PAID.2021.111051>
41. Soutter, A. R. B. and Möttus, R. (2020). Big five facets' associations with pro-environmental attitudes and behaviors. *Journal of Personality*, 89(2), 203–215. <https://doi.org/10.1111/jopy.12576>
42. Soutter, A. R. B., Bates, T. C., & Möttus, R. (2020). Big Five and HEXACO Personality Traits, Proenvironmental Attitudes, and Behaviors: A Meta-Analysis. *Perspectives on Psychological Science*, 15(4), 913–941. <https://doi.org/10.1177/1745691620903019>
43. Wang, Q.-C., Chang, R., Xu, Q., Liu, X., Jian, I. Y., Ma, Y.-T., & Wang, Y.-X. (2021). The impact of personality traits on household energy conservation behavioral intentions – An empirical study based on theory of planned behavior in Xi'an. *Sustainable Energy Technologies and Assessments*, 43, 100949. <https://doi.org/10.1016/j.seta.2020.100949>