



Environmental sustainability and national personality



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ABSTRACT

Previous research has linked higher levels of the personality traits Agreeableness and Openness with greater concern about environmental issues. While these traits are important predictors of environmental attitudes among individuals, a growing literature has begun examining the broader consequences of population differences in personality characteristics. The present study examines whether nationally-aggregated personality traits can be significant predictors of a country's environmental sustainability. National personality scores were derived from an existing database of 12,156 respondents across 51 countries and examined in relation to each country's scores on the Environmental Performance Index, a benchmark of the sustainability of a country's environmental policies. Just as Agreeableness and Openness predict environmental concern at the individual level, countries with higher population levels of Agreeableness and Openness had significantly better performance on the sustainability index. These results remained when controlling for national differences in wealth, education, and population size and were unique to these two traits.

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1. Introduction

Human behavior plays a critical role in ecological health, with individual and collective actions placing a large amount of strain on the natural environment (Gardner & Stern, 2002; Oskamp, 2000; Saunders, 2003). The long-term survival of human society requires that we adapt our individual behaviors and organizational policies to be more environmentally sustainable (Stern, 2000). Despite the importance of human action in ensuring a sustainable future, there are still large individual differences in the extent to which people are concerned about environmental issues and personally engage in environmentally sustainable behaviors (Bamberg & Möser, 2007; Dietz, Stern, & Guagnano, 1998; Dunlap, Van Liere, Mertig, & Jones, 2000; Fransson & Gärling, 1999; Milfont & Duckitt, 2004; Van Liere & Dunlap, 1980).

A variety of psychological factors play a role in shaping these individual differences: people with greater knowledge and awareness of environmental issues are more likely to act in a sustainable manner (Arcury, 1990; Hines, Hungerford, & Tomera, 1987); social and personal norms also play a role, with more salient guidelines for environmental action influencing attitudes and behavior (Bamberg & Möser, 2007; Biel & Thøgersen, 2007;

Blamey, 1998; Schwartz, 1973; Wiidegren, 1998); within the rational-economic framework, the incentives associated with environmental actions are also important, with greater commitment to sustainability emerging as the degree of personal impact and perception of control increases (Ajzen, 1991; Cordano & Frieze, 2000); personal values likewise have an impact, with pro-environmental attitudes associated with higher levels of altruism and openness to change, along with lower levels of traditionalism and self-interest (Dietz, Fitzgerald, & Shwom, 2005; Schultz & Zelezny, 1999; Schultz et al., 2005; Stern & Dietz, 1994; Stern, Dietz, & Kalof, 1993).

A growing body of research has also implicated basic personality traits as a source of individual differences in environmental concern and sustainable actions (Hirsh, 2010; Hirsh & Dolderman, 2007; Markowitz, Goldberg, Ashton, & Lee, 2012; Milfont & Sibley, 2012). Much of this research has focused on the five factor model of personality, which describes variation in personal characteristics along five trait dimensions (Digman, 1990; McCrae & John, 1992): Extraversion, which reflects social potency and sensitivity to rewards (Lucas, Diener, Grob, Suh, & Shao, 2000), Agreeableness, which reflects compassion and empathic social concern (Graziano & Eisenberg, 1997), Conscientiousness, which reflects self-discipline, industriousness, and preferences for order (Roberts, Chernyshenko, Stark, & Goldberg, 2005), Neuroticism, which reflects a strong aversive response to stress and uncertainty (Hirsh & Inzlicht, 2008; Judge, Erez, Bono, & Thoresen, 2002), and Openness,

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which reflects cognitive flexibility and aesthetic interests (DeYoung, Peterson, & Higgins, 2005).

The five factor model has become the most commonly used trait framework within personality psychology, encompassing the variance associated with most other personality taxonomies (McCrae & Costa, 1987). The five major personality dimensions emerge across distinct cultures and languages (McCrae, Terracciano, Khoury, et al., 2005), have a substantial biological component (DeYoung, 2010), and are relatively stable throughout the lifespan (McCrae & Costa, 1994). An individual's standing on each of these personality trait dimensions affects a wide variety of important life outcomes, playing important roles in shaping cognition, motivation, and behavior (Ozer & Benet-Martínez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007).

Within the environmental domain, two personality traits have emerged most consistently as predictors of environmental concern and behavior: Agreeableness and Openness (Hirsh, 2010; Hirsh & Dolderman, 2007; Milfont & Sibley, 2012; Nisbet, Zelenski, & Murphy, 2009). More agreeable individuals tend to display greater empathy and compassion, whereas less agreeable people tend to be more selfish and antisocial (Graziano & Eisenberg, 1997). The positive relationship between Agreeableness and environmental concern is consistent with research demonstrating that altruistic concerns are one of the major components of pro-environmental attitudes (Schultz, 2001). Empathic engagement with the natural world tends to promote the desire for environmental conservation as individuals become more aware of the harmful consequences of their actions (Schultz, 2000). A longitudinal analysis similarly found that higher levels of environmental engagement predicted more prosocial behavior and attitudes in a laboratory experiment two years later (Kaiser & Byrka, 2011).

More open individuals, meanwhile, tend to have greater levels of cognitive flexibility and stronger aesthetic interests (DeYoung et al., 2005; McCrae, 1994). The relationship between higher levels of Openness and more environmentally conscious behavior may be due to a number of factors. First, Openness is associated with greater cognitive ability, which may boost environmental concern through greater awareness of the long-term consequences of one's actions. Second, highly open individuals are also more open to change and self-transformation, suggesting a greater willingness to alter the status quo by adopting a sustainable lifestyle (e.g., becoming a vegetarian or vegan; Goldberg & Strycker, 2002). Third, one of the primary motivators for pro-environmental attitudes is the aesthetic value that nature provides (Kellert, 1997). Open individuals' higher levels of aesthetic appreciation may thus result in a more direct experience of nature's value and importance.

Finally, both Agreeableness and Openness influence the extent to which the natural world is regarded as part of the self-concept (Hirsh & Dolderman, 2007; Nisbet et al., 2009). The extent to which the self is regarded as part of nature or separate from it is a central issue within the deep ecology movement (Bragg, 1996; Naess, 1973), and is an important predictor of environmental attitudes (Mayer & Frantz, 2004; Nisbet et al., 2009; Schultz, Shriver, Tabanico, & Khazian, 2004). Agreeable individuals tend to be more inclusive in their self-concepts, broadening their empathic circles to include a larger community than less agreeable individuals (Graziano & Eisenberg, 1997). Openness is likewise associated with the permeability of self-boundaries, and the ease with which a rigid sense of self is transcended (McCrae, 1994). While other personality traits have also been associated with environmental concern, such as Neuroticism and Conscientiousness, these relationships have been inconsistently observed, suggesting that their impact may be moderated by some unspecified contextual variable (Hirsh, 2010; Milfont & Sibley, 2012).

While personality psychologists have traditionally examined dispositional variation in psychological characteristics among individuals, researchers have recently begun examining personality differences between entire populations of individuals (Rentfrow, Gosling, & Potter, 2008). Aggregating individual scores on personality questionnaires to a broader group of people produces reliable estimates of population-level personality traits (McCrae, Terracciano, Leibold, et al., 2005). Although there still remains a great deal of within-population variation in these traits, such aggregation procedures have resulted in reliable personality differences being observed across different geographical regions within a single country (Rentfrow, 2010), and across nations (McCrae, Terracciano, Leibold, et al., 2005). Population differences in personality traits could emerge from a variety of factors, including shared cultural and socioeconomic influences, selective migration, and genetic drift due to distinct selective pressures in different geographic environments (Rentfrow et al., 2008). Aggregate personality traits are in fact closely related to variation in cultural dimensions and social values (Hofstede & McCrae, 2004; McCrae, 2001). Most importantly, aggregate personality scores are effective predictors of large scale social outcomes. National personality differences, for example, are significant predictors of Gross Domestic Product, global competitiveness, and indices of human development (McCrae, Terracciano, Leibold, et al., 2005). Regional personality differences within the United States have likewise been used to predict geographical differences in voting patterns (Rentfrow, Jost, Gosling, & Potter, 2009), well-being (Rentfrow, Mellander, & Florida, 2009), and social equality (De Vries, Gosling, & Potter, 2011).

Although population-level personality traits appear to be important predictors of various social and economic outcomes, their relation to indices of environmental sustainability remains underexplored. In recent years, a variety of metrics have been developed for benchmarking a country's effective management of its natural resources (Böhringer & Jochem, 2007; Parris & Kates, 2003). These benchmarks are important because they help to translate the goal of environmental sustainability into measurable quantitative targets, allowing for the scientific assessment of different environmental policies and initiatives (Liverman, Hanson, Brown, & Merideth, 1988). Ranking countries on their environmental performance also helps to make salient the specific challenge areas where greater attention is needed to ensure sustainability. Although the measurement of environmental sustainability is continually developing and being refined, there is nonetheless some degree of convergence among alternative indices (Siche, Agostinho, Ortega, & Romeiro, 2008; Wilson, Tyedmers, & Pelot, 2007).

Given the importance of population-level personality differences in predicting a variety of social outcomes, combined with personality's relationship with environmental attitudes and behavior among individuals, national differences in aggregated personality traits might be related to a nation's environmental sustainability. If more of a country's citizens have personality characteristics that predispose them toward an environmentally sustainable mindset, this may have implications for the environmental performance of the nation as a whole. The current study explored this possibility by examining cross-national differences in aggregated personality traits in relation to nationally-measured environmental sustainability.

Only one study has previously investigated this possibility. In addition to examining the relationship between individual personality traits and environmental outcomes in two nationally-representative samples, Milfont and Sibley (2012) also examined how nationally aggregated traits relate to country-level scores on the New Environmental Paradigm scale (Hawcroft & Milfont, 2010),

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