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Is there a link between cognitive abilities and environmental awareness? Cross-national evidence

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ABSTRACT

This article explores the effect of cognitive abilities on environmental awareness using data from 119 countries for the period 2005–2015. Our findings provide pioneering confirmation that a facet of human psychology, namely cognitive ability, is positively associated with environmentalism. The empirical estimations indicate that when cognitive abilities increase by one standard deviation, climate change awareness increases by approximately 19% (slightly less than one standard deviation). This positive association remains intact when we control for other determinants of environmentalism.

1. Introduction

Several studies illustrate that cognitive ability (intelligence) has numerous implications for society. For example, the association between cognitive ability and various socio-economic issues, including income inequality, economic growth, life satisfaction, and distribution of national happiness has been extensively explored in recent years (Jones, 2011; Ram, 2007; Rindermann et al., 2015; Nikolaev and Salahodjaev, 2016). Indeed, cognitive capitalism theory suggests that if cognitively able individuals earn more income than individuals with a lower level of cognitive skills, then nations with higher average cognitive abilities should be associated with a higher level of per capita wealth than nations with lower average cognitive abilities. It is presumed that economic growth in more cognitively able societies is driven by technological progress, off-farm employment opportunities, and stronger protection of private property and should be systematically associated with lower environmental degradation. Moreover, it may be inferred that, considering that cognitive abilities are significantly correlated with economic development, in developed countries 'people value [less] material well-being over environmental amenities, [and] once a country reaches a sufficiently high per capita income, people give greater attention to the environment' (Lopez and Mitra, 2000, p. 137). Thus, economic growth in cognitively able nations may be less dependent on environment-damaging production.

However, the relationship between cognitive abilities and measures of environmental quality is complex. For example, while Squalli (2014) finds that the effect of IQ on emissions of CH4, CO2, and N2O is at best mixed, there is also evidence that cognitive abilities are negatively (Omanbayev et al., 2018) and non-linearly (Salahodjaev et al., 2016) related to CO2 emissions. In a similar vein, Salahodjaev (2016), using data from 186 countries, finds that national IQs have a causal effect on global forest cover change during the period between 1990 and 2010.

In this study, we contribute to the extant literature by further exploring the link between cognitive abilities and environmental indicators. In particular, we argue that the weakness of the related psychological and environmental literature is that it overlooks the association between cognitive abilities and national environmental values by focusing only on hard measures of environmental performance. In this study, we argue that beside its direct correlation with environmental indicators, cognitive ability, as a psychological concept, may be linked to the level of environmental concern expressed by the population, and therefore, indirectly associated with ecological degradation. To the best of our knowledge, this is the first article that investigates the link between cognitive abilities and environmental values across nations, measured by the share of the population that is aware of global warming or climate change.

There are several arguments for why societies in countries with higher levels of cognitive abilities are more likely to be aware of global climate change. First, cognitively able societies are more likely to adopt effective and accountable institutions (Kanyama, 2014). These institutions, which endorse freedom of the press, civil rights and political liberties, are more likely to inform society about existing environmental issues (Rindermann, 2008). Moreover, efficiently functioning institutions in cognitively able societies create the impetus for agents to act legally and increase the costs of underground activities that are associated with environmental degradation such as air pollution or illegal logging (Salahodjaev, 2015). Consequently, bureaucrats in these institutions are less likely to engage in rent-seeking and 'respond through the implementation of environmental legislation, appropriate tax-

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subsidy policies, and other measures that lead to a better environment' (Lopez and Mitra, 2000, p. 137).

Cognitively able societies are also more likely to be environmentally concerned and more patient (Jones and Podemska, 2010) and tend to 'make choices that focus on generating long-run rather than short-run gains' (Squalli, 2014, p. 34). For example, higher IQ societies are associated with less corruption (Potrafke, 2012) and more efficient use of natural wealth (Obydenkova and Salahodjaev, 2016). Indeed, cognitive abilities are instrumental to social orders such as trust (Sturgis et al., 2010). This is pivotal to the competence of people to cultivate empathy and to solve common problems such as environmental degradation. Furthermore, cognitive abilities predict political behaviour such as liberalism, political participation, and the probability of voting for parties with environmental agendas (Solon, 2014), which is instrumental for the development of environmental protection. Similarly, Obydenkova and Salahodjaev (2017) report that both political institutions and cognitive skills are instrumental to implementing climate change policies across developed and developing nations.

Most importantly, according to the Savanna-IQ interaction hypothesis (otherwise known as the *intelligence paradox*), cognitively able societies are more likely to adopt and nurture evolutionary novel behavioural tendencies such as environmentalism that our ancestors did not exhibit (Kanazawa, 2010, 2012). Indeed, in his work on the role of IQ in shaping the values of nations, Kanazawa (2009) concludes by stating that 'future empirical work must consider other evolutionarily novel and familiar values besides the ones considered and tested in this paper…[M]ore intelligent individuals are more likely to espouse such other evolutionarily novel values as feminism and environmentalism' (p. 553).

The inferred association between cognitive abilities and environmentalism is examined in a sample of 119 nations for the period 2005–2015. The estimates suggest that an increase in average cognitive skills at a national level by one standard deviation increases climate change awareness by approximately 19% (slightly less than one standard deviation). This link remains robust even after controlling for other socio-economic antecedents of environmentalism.

2. Data and methods

2.1. Dependent variable

The dependent variable in this study is the national level of climate change awareness. This variable is measured as a share of a country's population who respond that they are 'aware' on the survey question 'How much do you know about global warming or climate change?'. The data is from the largest cross-sectional survey of climate change perceptions conducted by the Gallup World Poll in 119 countries, representing over 90% of the world's population. The climate change awareness levels range from 20% in Liberia to 98% in Japan.

2.2. Independent variable

Our main independent variable is the national average of cognitive abilities. In his study, Rindermann (2007) measures a common cognitive ability at the macro-social level for 194 countries and geopolitical regions. To estimate the index, the author uses data from nationally administered IQ tests, school assessment tests (e.g., TIMMS or PISA), and adult literacy studies. For interpretation purposes, the final scores are rescaled by setting the g-factor in Britain at 100 (standard deviation = 15) and the scores for the remaining countries are adjusted for this scale. To present the association between cognitive abilities and environmental awareness, we present correlations between cognitive ability index scores and our dependent variable. Fig. 1 displays preliminary evidence that overall cognitive abilities are positively associated with climate change awareness. For instance, the correlation between the cognitive abilities index and climate change awareness is r = 0.84.

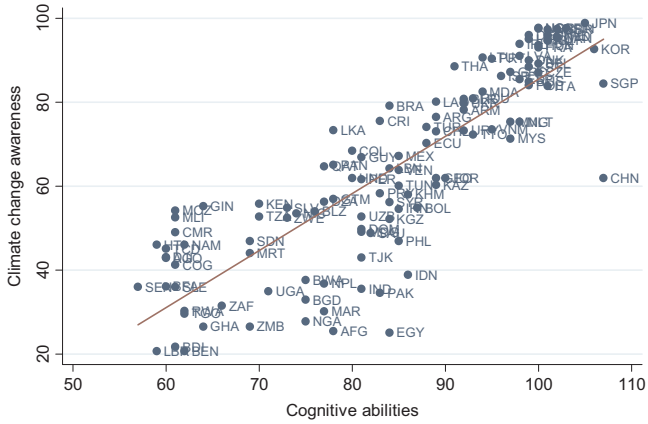

Fig. 1. Cognitive abilities and climate change awareness. Source: Rindermann (2007); Lee et al. (2015).

It is also probable that increase in cognitive abilities is not in itself responsible for the increase in climate change awareness; other variables correlated with economic development and demographic change may explain cross-national variations in environmentalism.

2.2.1. GDP per capita

Empirical literature documents that GDP per capita follows a non-monotonic association with environmental indicators, referred to as the environmental Kuznets curve relationship. Stern (2004) argues that '[i]n the early stages of economic growth degradation and pollution increase, but beyond some level of income per capita, which will vary for different indicators, the trend reverses, so that at high income levels economic growth leads to environmental improvement' (p. 1419). For example, Chow and Li (2014), using data for 132 nations for the period between 1992 and 2004, finds that there is an inverted U-shaped association between air pollution and GDP per capita. In a similar vein, Bhattarai and Hammig (2001) infer a non-monotonic relationship between economic development and deforestation. Based on previous studies, we estimate a cubic form econometric specification for a more flexible interpretation of the environmental Kuznets curve hypothesis.

2.2.2. Political institutions

It is believed that democratic regimes create the necessary conditions to foster fair distribution of resources and power and provide essential civil liberties and political rights, which in turn form the necessary social, political, and economic conditions that lead to greater environmentalism. Widespread citizen involvement in political matters and electoral competitions increases the stringency of environmental policymaking. In democratic societies, individuals have greater access to information (via press freedom), and thus, are more informed about existing environmental problems. Moreover, in democratic regimes 'non-governmental organizations that can work to help inform the public about environmental problems, can act as watchdogs on public agencies, and can directly lobby members of government' (Winslow, 2005, p. 772). However, recent evidence suggests that '[environmental degradation] radically increases over the process of political regime transition: from non-democratic regimes to higher levels of democracy' (Obydenkova et al., 2016, p. 485). In weak democratic regimes, the ruling elite, driven by populism, allocate greater resources to achieve rapid economic growth and fail to focus on existing environmental issues. Thus, in line with existing literature (Buitenzorgy and Mol, 2011), we include the democracy index and its squared term to test whether environmental awareness declines in countries with weak democratic regimes. The democracy index is calculated as a mean of civil liberties and political rights indices from Freedom House. In our study, this index ranges from 1 (least democratic) to 7 (most democratic).