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The Role of Post-Materialist Values in Environmental Protection: Insights from the World Values Survey

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Abstract
This study explores the interplay between post-materialism and environmental protection. This study utilizes data from Wave 7 of the World Values Survey (2017–2021), covering 66 countries and 85,000 participants. The sample includes 2,342 individuals from low-income countries, 21,956 from lower-middle-income, 31,480 from upper-middle-income, and 29,556 from upper-income countries. The logistic regression analysis demonstrates that post-materialist values significantly influence the likelihood of prioritizing the environment over economic growth. Individuals with post-materialist values consistently show a higher tendency to prioritize environmental protection compared to materialists. Individuals with mixed values balance materialist and post-materialist perspectives, showing a moderate inclination toward environmental priorities. Post-materialists prioritize self-expression, quality of life, and sustainability, supporting policies that align economic growth with ecological preservation. In contrast, materialists prioritize economic growth and physical security, showing less concern for environmental issues. The effect of mixed and post-materialist values is strongest in upper-income countries and weakest in low-income countries. Post-materialist individuals consistently prioritize environmental concerns across all income groups, while mixed-value individuals show a moderate inclination, particularly in wealthier nations. The insights from the study illuminate the transformative role of post-materialist values in shaping a sustainable future for humanity and the planet.
Keywords: *Environmental protection, Economic growth, Post-materialism*

INTRODUCTION
Humanity is confronted with a historic ecological crisis during a time when the foundations of life on Earth are undergoing rapid industrialization, technological advancement, and skyrocketing global consumption patterns. Among the many environmental challenges which need urgent attention are climate change, deforestation, biodiversity loss, and resource depletion (Solangi & Jianguo, 2023). But these problems also have serious consequences for what they imply about the sustainability of the natural systems that support our societies and for what they say about the values and priorities that animate modern societies (Yasmeen et al., 2024; Yan & Sirboonchitta, 2024). The theory of post materialism serves as a powerful theoretical glasses to view changes in societal preferences of environmental protection.

According to Inglehart (1995), post materialism is a society's transition from the value of securing and gaining material wealth and increasing economic growth for public well-being and social order, to the value of quality of life, self-expression and the preservation of the environment. Recent shifts in these trends occur in societies that have reached some economic development with the provision of basic needs and individuals have started focusing more on higher order issues. Post materialist values fall very close to environmental protection, which involves both human consumption and ecological preservation. These values represent sustainability, ethical responsibility and the worth of the intrinsic that is nature, over unchecked economic expansion.

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The relationship between post materialism and environmental protection is multifaceted, and context dependent. Because post material values assume that people with more 'affluent societies' care more about environmental issues than people with less affluent societies, developing nations may give precedence to growth and material security over ecological considerations (Booth, 2021; Zenios, 2024). Yet this dichotomy is changing, as environmental degradation affects all regions, regardless of their economic status (Uddin et al., 2014). It follows that there is an need to support a global ethic that includes post materialism and environmental stewardship so that it can tackle the ecological challenges confronting us together.

Previous research has emphasized that post-materialist values are associated with pro-environmental attitudes; individuals endowed with post-materialist values prioritise environmental protection over economic growth (Ahmad & Alvi, 2024; Gugushvili, 2021; Combes et al., 2018; Lengfeld & Gerhards, 2008; Sulemana, 2016; Gelissen, 2007; Kidd & Lee, 1997). Importantly, materialism has been found to harm environmental beliefs and to negatively influence pro-environmental behavior (Kilbourne & Pickett, 2008; Wang et al., 2019; Audi, 2024). This existing body of literature remain untapped in context of robust econometrics methodology and heterogeneity analysis based on income categories of countries. The heterogeneity analysis of low income, lower middle income, upper middle income and upper income context. This study addresses these gaps to develop a more comprehensive understanding of how values relate to environmental protection, and how to create strategies to promote sustainable behaviors among diverse populations.

The micro level trade-off between prioritizing environment and economic growth is shaped by different factors. Affluence is a great prediction on pro-environment, more affluence means more concerned about the environmental preservation (Diekmann & Franzen, 1999). Relatively younger people (Tranter, 2011), females (Arnocky & Stroink, 2010) and persons more exposed to pollution (i.e., urban residents) are found to be more environmentally concerned than older people, males and rural residents (Sulemana, 2016). We find married individuals are more growth orientated than the unmarried (Nili & Asadi, 2024). Furthermore, prioritization of environmental concerns is perceived to have a positive association with higher education (Gugushvili, 2021).

METHODOLOGY

This study aims to investigate the impact of post-materialist value orientations on the probability of individuals prioritizing either environmental protection or economic growth. To analyze this relationship, a binary logistic regression model is utilized, given the binary nature of the dependent variable (Shair et al., 2022; 2023). The econometric model employed in this research is specified as follows:

$$Environment\ priority_i = \alpha_0 + \sum_{k=1}^{3} \alpha_{k1} Post\ materialistic_{ki} + \alpha_2 age + \alpha_3 Female_i + \alpha_4 Rural_i + + \sum_{k=1}^{3} \alpha_{k5} Marital\ status_{ki} + \sum_{k=1}^{3} \beta_{k5} Education_{ki} + \varepsilon_i$$

In this context, i represents individuals, k denotes the categories of the specified variable, α_s are the coefficients to be estimated, while ε_i represents the error term. The definitions of the variables utilized in the study are detailed in Table 1.

Table 1: Definition of the variables

Variable	Description
Dependent variable:	
Prioritizing Environment or Economic Growth	A binary variable coded as 1 if the primary preference is environmental protection and 0 if the primary preference is economic growth.
Key variable:	
Post materialism	The multinomial categorical variable consists of three categories: materialist, mixed, and post-materialist.
Covariates:	
Age	Age of the respondents in years old
Female	A binary variable coded as 1 for female respondents and 0 for all others.
Rural	A binary variable coded as 1 for rural respondents and 0 for all others.
Marital status	The multinomial categorical variable consists of three categories: single, currently married, and formerly married.

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Education	The ordinal categorical variable consists of three categories: lower middle, and higher.

DATA AND DESCRIPTIVE ANALYSIS

Data Source

This study draws on data from the most recent Wave 7 of the World Values Survey (WVS), conducted between 2017 and 2021. The dataset includes 66 countries and, after addressing missing values, comprises responses from 85,000 participants. The sample distribution includes 2,342 individuals from low-income countries, 21,956 from lower-middle-income countries, 31,480 from upper-middle-income countries, and 29,556 from upper-income countries.

Descriptive Analysis

The descriptive statistics of the variables used in the study are presented in the Table 2. It also examines the relationship between individuals' value orientations (materialist, mixed, post-materialist) and their prioritization of environmental protection versus economic growth. The whole sample indicates that 59% of individuals prioritize the environment, while 30% are materialist, 59% have mixed values, and 11% are post-materialist. Among the subgroup that prioritizes the environment, 27% are materialist, 59% have mixed values, and 13% are post-materialist. Conversely, in the subgroup that prioritizes economic growth, 33% are materialist, 59% have mixed values, and 9% are post-materialist. These results suggest that post-materialist values are more strongly associated with prioritizing environmental concerns, as a slightly higher proportion of post-materialists (13%) are in the environment-prioritized group compared to the growth-prioritized group (9%). In contrast, materialist values align more with prioritizing economic growth, as 33% of the growth-prioritized group are materialist compared to 27% in the environment-prioritized group. Individuals with mixed values are equally distributed across both groups, showing no clear bias toward either prioritization. This supports the idea that value orientations influence how individuals weigh environmental protection against economic growth.

Table 2: Descriptive statistics

Variable	Whole sample				Environment prioritized individuals sample	Growth prioritized individuals sample
	Mean	Std. dev.	Min	Max	Mean	Mean
Prioritizing environment	0.59	0.49	0	1	1	0
Materialist	0.3	0.46	0	1	0.27	0.33
Mixed	0.59	0.49	0	1	0.59	0.59
Post materialist	0.11	0.32	0	1	0.13	0.09
Age	42.93	16.88	16	103	42.52	43.15
Female	0.53	0.5	0	1	0.53	0.51
Rural	0.32	0.47	0	1	0.32	0.33
Marital status:	0	0	0	0	0	0
Currently married	0.64	0.48	0	1	0.63	0.65
Formerly married	0.12	0.33	0	1	0.12	0.12
Single	0.24	0.43	0	1	0.25	0.23
Education:	0	0	0	0	0	0
Lower	0.32	0.47	0	1	0.29	0.36
Middle	0.35	0.48	0	1	0.34	0.36
Higher	0.33	0.47	0	1	0.37	0.28

The Table 2 provides demographic information on age, gender, and rural/urban residence for the study sample, comparing individuals who prioritize environmental protection with those who prioritize economic growth. The mean age of the whole sample is 42.93 years, with a standard deviation of 16.88, indicating a wide age range (16

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to 103 years). Individuals prioritizing the environment have a slightly lower mean age (42.52 years) compared to those prioritizing economic growth (43.15 years), though the difference is minimal. In terms of gender, 53% of the whole sample is female, with the same percentage among those prioritizing the environment, while slightly fewer (51%) are female in the economic growth group, suggesting gender has minimal influence on these priorities. Regarding rural/urban residence, 32% of the whole sample resides in rural areas, a proportion that remains consistent for individuals prioritizing the environment (32%) and slightly increases for those prioritizing economic growth (33%).

Regarding marital status, 64% of the whole sample are currently married, with 63% of those prioritizing the environment and 65% of those prioritizing economic growth falling into this category, showing minimal variation. Similarly, 12% of the whole sample are formerly married, a proportion consistent across both groups. Among singles, 24% of the whole sample are single, slightly higher in the environment-prioritized group (25%) and slightly lower in the growth-prioritized group (23%). For education, 32% of the whole sample have lower education, with a lower proportion in the environment-prioritized group (29%) and a higher proportion in the growth-prioritized group (36%). Middle education levels are evenly distributed, with 35% of the whole sample, 34% of the environment-prioritized group, and 36% of the growth-prioritized group. Higher education, at 33% of the whole sample, is more common in the environment-prioritized group (37%) than in the growth-prioritized group (28%). While marital status shows little variation between the two groups, education levels highlight a distinction: individuals prioritizing environmental protection are more likely to have higher education, whereas those prioritizing economic growth tend to have lower education. This suggests that education may play a role in shaping individuals' priorities between environmental and economic concerns.

RESULTS AND DISCUSSION

Regression Analysis

The estimates of the logistic regression model are presented in Table 3. We estimated six models to assess the robustness of the impact of post-materialist values on prioritizing the environment. In a logistic regression model where the dependent variable is binary (coded as 1 for individuals prioritizing the environment and 0 for those prioritizing economic growth), the odds ratio (OR) measures how the odds of prioritizing the environment change relative to a reference category. The odds ratio is interpreted as the factor by which the odds of the outcome (prioritizing the environment) increase (OR > 1) or decrease (OR < 1) for a given group compared to the reference group. When expressed as a percentage, an odds ratio greater than 1 indicates a percentage increase in odds, while an odds ratio less than 1 reflects a percentage decrease in odds.

The odds ratio indicates that value orientation has a strong and significant impact on whether individuals prioritize the environment. Post-materialist odds ratio (OR) is 1.816, meaning individuals with “Post-materialist” values are 81.6% more likely to prioritize the environment compared to individuals with “Materialist” values. Across the models, the odds ratios range from 1.734 (Model 6) to 1.823 (Model 3), indicating a consistent trend of post-materialist individuals showing a significantly higher likelihood of prioritizing the environment relative to materialists. While those individuals with mixed values exhibit an odds ratio (OR) of 1.208, which means individuals with “Mixed” values are 20.8% more likely to prioritize the environment compared to individuals with “Materialist” values. This is consistent across all models (Model 1 to Model 6), with very slight variations due to the standard errors.

Post-materialist individuals prioritize self-expression, quality of life, and long-term sustainability over material needs like economic growth (Booth, 2018; Lim et al., 2021). This value orientation emerges in societies where basic needs are largely met, allowing individuals to focus on issues like environmental protection (Kafka & Kostis, 2021). Post-materialists view environmental sustainability as essential to maintaining quality of life and addressing global challenges, aligning with their emphasis on collective well-being, future generations, and ethical responsibility (Jordaan & Dima, 2020). Additionally, they often support policies that balance economic progress with ecological preservation, reflecting their broader commitment to non-materialistic and altruistic goals (Gugushvili, 2021).

Individuals with a mixed value orientation balance materialist and post-materialist perspectives, making them more likely to recognize the importance of both economic needs and environmental sustainability (Morales &

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Holtschlag, 2013). Unlike materialists, who prioritize economic growth and physical security, mixed individuals value quality of life and long-term well-being, which aligns with environmental concerns (Moors & Vermunt, 2007). They may view environmental protection as essential for sustaining economic progress and societal health, leading to a higher likelihood of preferring the environment over growth (Tsai & Peng, 2024). This dual perspective allows them to appreciate the interconnectedness of environmental and economic priorities, fostering greater support for sustainability efforts.

Table 3: Estimates of the logistic regression model – odds ratio

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Materialist (base)						
Mixed	1.208***	1.206***	1.209***	1.207***	1.207***	1.195***
	(0.0186)	(0.0186)	(0.0187)	(0.0187)	(0.0187)	(0.0187)
Post materialist	1.816***	1.817***	1.823***	1.816***	1.807***	1.734***
	(0.0454)	(0.0456)	(0.0458)	(0.0457)	(0.0456)	(0.0441)
Age		0.998***	0.998***	0.998***	0.999*	1.000
		(0.000421)	(0.000421)	(0.000422)	(0.000493)	(0.000501)
Female			1.090***	1.090***	1.102***	1.110***
			(0.0151)	(0.0151)	(0.0155)	(0.0158)
Rural				0.945***	0.954***	1.023
				(0.0140)	(0.0142)	(0.0157)
Currently married (base)						
Formerly married					0.969	0.982
					(0.0220)	(0.0225)
Single					1.117***	1.097***
					(0.0207)	(0.0205)
Primary education (base)						
Middle education						1.120***
						(0.0194)
Higher education						1.485***
						(0.0269)
Constant	1.203***	1.333***	1.269***	1.299***	1.181***	0.946*
	(0.0151)	(0.0298)	(0.0301)	(0.0319)	(0.0341)	(0.0303)
Observations	87,071	86,639	86,603	86,574	86,264	85,701

seEform in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Age consistently shows an odds ratio slightly below 1 (approximately 0.998) in Models 1–3, indicating a small negative relationship where each additional year of age reduces the odds of prioritizing the environment by approximately 0.2%. This effect diminishes in Model 4 (OR = 0.999) and becomes insignificant in Model 5 (OR = 1.000). Age have an insignificant impact on prioritizing the environment over growth because environmental attitudes are shaped more by value orientations, education, and socio-economic factors than by age alone.

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Moreover, it can be explained that younger individuals' focus on sustainability and older individuals' preference for stability often balance out, with other factors like income and culture playing more significant roles.

Gender (female) consistently exhibits odds ratios greater than 1 (ranging from 1.090 to 1.110), indicating that women are 9–11% more likely than men to prioritize the environment, with this effect remaining statistically significant across all models. Females are more likely to prioritize the environment over growth due to nurturing tendencies, long-term thinking, higher environmental awareness, and concern for family well-being, influenced by social and cultural roles that align with environmental protection.

Rural residence initially shows a negative association with prioritizing the environment, with odds ratios of 0.945 in Model 3 and 0.954 in Model 4, suggesting rural individuals are 5–6% less likely to prioritize the environment compared to urban individuals. However, this effect diminishes in Model 5, where the odds ratio reaches 1.023, indicating no significant difference between rural and urban populations.

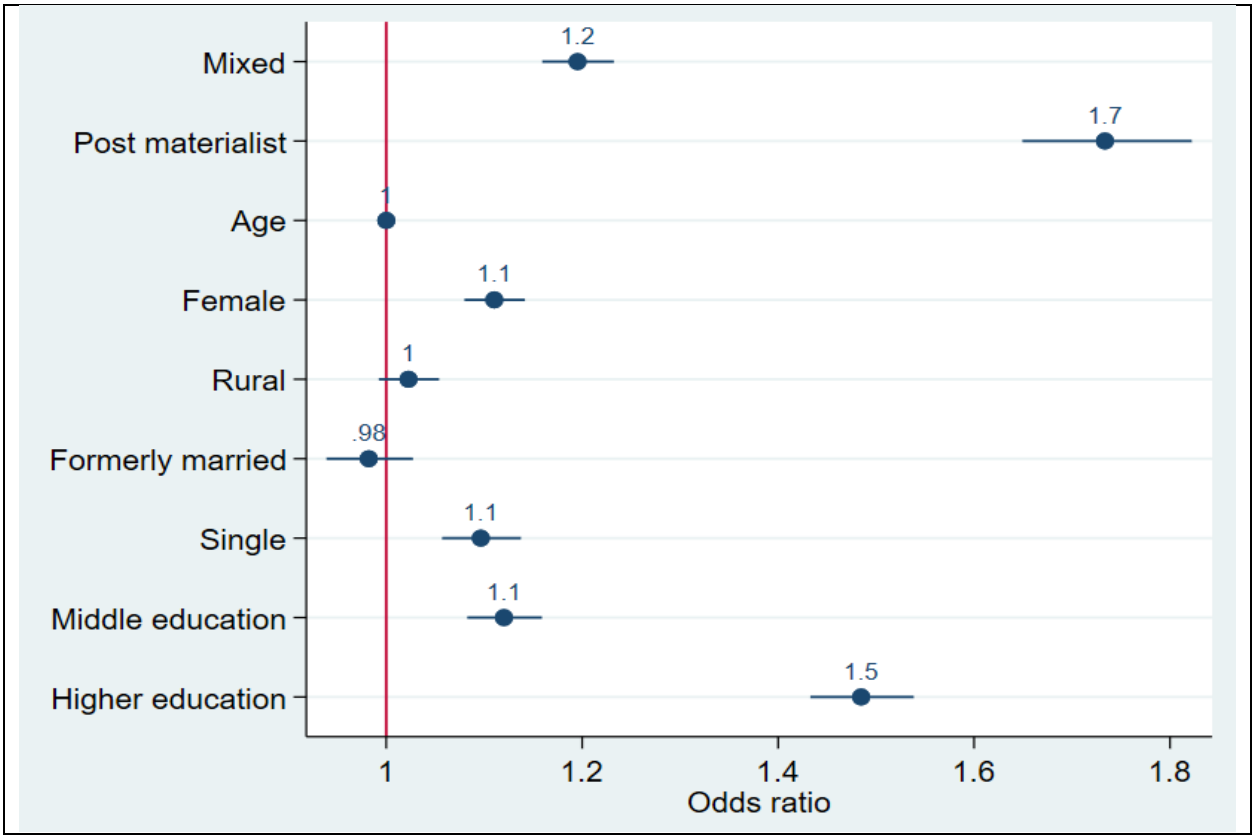

Figure 1: Coefficient plot of odds ratio

The table 3 provides odds ratios for marital status across logistic regression models predicting whether individuals prioritize the environment (coded as 1) or economic growth (coded as 0). For marital status, currently married individuals serve as the reference category. Formerly married individuals have odds ratios of 0.969 (Model 5) and 0.982 (Model 6), indicating a slight, insignificant negative relationship with prioritizing the environment. In contrast, single individuals have odds ratios of 1.117 (Model 5) and 1.097 (Model 6), indicating they are 11.7% and 9.7% more likely, respectively, to prioritize the environment compared to those who are currently married, with this effect being statistically significant. These findings suggest that single individuals are more likely to prioritize environmental concerns, emphasizing the role of marital status in shaping environmental attitudes.

For education, primary education serves as the reference category. Individuals with middle education have an odds ratio of 1.120 (Model 6), indicating they are 12% more likely to prioritize the environment compared to those with primary education. Those with higher education have an odds ratio of 1.485 (Model 6), meaning they are 48.5%

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more likely to prioritize the environment, showing a strong and statistically significant positive relationship. These findings suggest that single individuals and those with higher education levels are more likely to prioritize environmental concerns, emphasizing the role of education in shaping environmental attitudes.

Heterogeneity analysis

The table 4 and Figure 2 presents odds ratios from a logistic regression model predicting whether individuals prioritize the environment (coded as 1) or economic growth (coded as 0), with heterogeneity analyzed across countries grouped by income levels. The total sample consists of 85,701 observations, with 2,342 from low-income countries, 21,956 from lower-middle-income countries, 31,480 from upper-middle-income countries, and 29,556 from upper-income countries. The distribution shows that the sample is heavily skewed toward middle- and upper-income countries, with significantly fewer observations from low-income countries. This reflects disparities in data availability and population representation across income groups, potentially influencing the robustness of findings for low-income countries.

For individuals with mixed values, the odds of prioritizing the environment are 19.5% higher than for materialists in the whole sample. This effect varies by income group, with no significant difference in low-income countries, a 15.2% increase in lower-middle-income countries, a 13.6% increase in upper-middle-income countries, and the strongest effect observed in upper-income countries, where mixed-value individuals are 27.3% more likely to prioritize the environment. Among the entire sample, the odds of persons post materialists favoring the environment over economic progress are 73.4 % more than among materialists. And that positive effect is seen across all income groups, although its magnitude differs: in low income countries post materials are 44.7 per cent more likely to choose environment over materialism; 40.5 per cent in lower middle; 28.5 per cent in upper middle; and 122.8 per cent in upper income group, where it is strongest. Findings suggest that environmental prioritization is heightened for individuals with mixed and post materialist values compared to materialists, and more so when country income levels are increasing.

Individuals with mixed values are more likely to prioritize the environment over materialism and this effect is particularly pronounced in upper income countries (27.3%), but not at all in lower ones. In all income groups, post-materialist individuals are more likely to give the environment higher priority than materialists (large effect in upper income countries, 122.8%, and medium effect in low income countries, 44.7%). The strength of the relationship between value orientation and environmental prioritization increases with income levels, suggesting that individuals in wealthier countries may place greater emphasis on post-materialist and mixed values in their environmental attitudes.

The heterogeneity analysis reveals variations in the effects of age, gender, and rural residence on prioritizing the environment across countries grouped by income levels. Age shows no significant effect in the whole sample but has varying impacts across income groups. In low-income and lower-middle-income countries, older individuals are slightly more likely to prioritize the environment, with a 0.3% increase in odds per year of age in lower-middle-income countries. However, in upper-middle-income and upper-income countries, younger individuals are more likely to prioritize the environment, with age reducing the odds by 0.2% and 0.4% per year, respectively.

Gender effects are significant in the whole sample, where women are 11% more likely to prioritize the environment. This effect is strongest in upper-income countries, where women are 24% more likely to prioritize environmental concerns, while the effect is weaker and insignificant in low-income and middle-income countries. Rural residence shows a positive association with environmental prioritization in low-income and middle-income countries, with rural individuals being 23.9% more likely in low-income countries and 22.3% more likely in upper-middle-income countries to prioritize the environment. Conversely, in upper-income countries, rural residents are 14.8% less likely to prioritize the environment compared to urban residents.

The heterogeneity analysis reveals variations in how marital status and education influence prioritizing the environment across countries grouped by income levels. For marital status, formerly married individuals show no significant effect in the whole sample but are 66.2% more likely to prioritize the environment in low-income countries, while in upper-middle-income countries, they are 10.2% less likely to do so. Single individuals are 9.7% more likely to prioritize the environment in the whole sample, with significant positive effects observed in lower-middle-income (17.2%) and upper-income countries (10.1%), though the effect is insignificant in low-income and upper-middle-income countries.

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Table 4: Heterogeneity analysis

	(1)	(2)	(3)	(4)	(5)
VARIABLES	whole sample	low income country	lower middle income country	upper middle income country	upper income country
Materialist (base)					
Mixed	1.195***	0.998	1.152***	1.136***	1.273***
	(0.0187)	(0.0864)	(0.0348)	(0.0283)	(0.0368)
Post materialist	1.734***	1.447*	1.405***	1.285***	2.228***
	(0.0441)	(0.289)	(0.0742)	(0.0585)	(0.0911)
Age	1.000	1.003	1.003***	0.998**	0.996***
	(0.000501)	(0.00351)	(0.00113)	(0.000902)	(0.000835)
Female	1.110***	1.124	1.050*	1.037	1.240***
	(0.0158)	(0.0975)	(0.0293)	(0.0242)	(0.0308)
Rural	1.023	1.239**	1.084***	1.223***	0.852***
	(0.0157)	(0.124)	(0.0302)	(0.0307)	(0.0281)
Currently married (base)					
Formerly married	0.982	1.662***	1.060	0.898***	1.040
	(0.0225)	(0.283)	(0.0546)	(0.0339)	(0.0378)
Single	1.097***	1.039	1.172***	1.011	1.101***
	(0.0205)	(0.124)	(0.0435)	(0.0316)	(0.0361)
Primary education (base)					
Middle education	1.120***	0.854	1.201***	1.068**	1.175***
	(0.0194)	(0.0862)	(0.0393)	(0.0301)	(0.0410)
Higher education	1.485***	1.053	1.625***	1.142***	1.773***
	(0.0269)	(0.114)	(0.0582)	(0.0339)	(0.0630)
Constant	0.946*	0.588***	0.736***	1.217***	1.036
	(0.0303)	(0.115)	(0.0472)	(0.0659)	(0.0654)
Observations	85,701	2,342	21,956	31,480	29,556

seEform in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Regarding education, individuals with middle education are 12% more likely to prioritize the environment in the whole sample, with significant positive effects in lower-middle-income (20.1%), upper-middle-income (6.8%), and upper-income countries (17.5%). In low-income countries, however, middle education shows an insignificant negative effect. Higher education strongly increases the likelihood of prioritizing the environment, with individuals in the whole sample being 48.5% more likely, and the effect is most pronounced in upper-income (77.3%) and lower-middle-income countries (62.5%). In low-income countries, higher education shows a negligible effect. These results highlight that education influence environmental prioritization differently across income groups, with stronger positive effects of education observed in wealthier nations and varying impacts of marital status across contexts.

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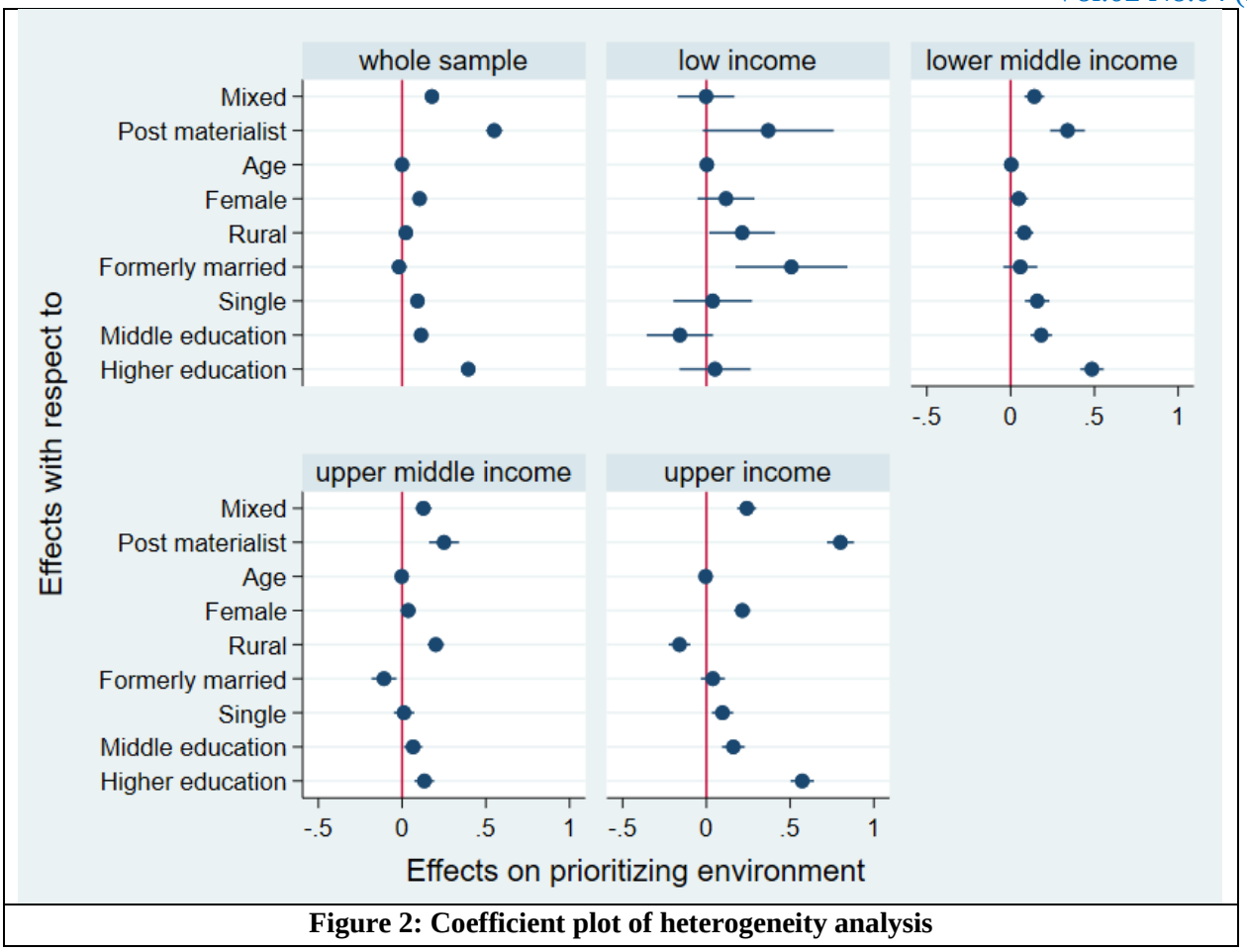

Figure 2: Coefficient plot of heterogeneity analysis

CONCLUSION

This study explores the interplay between post-materialism and environmental protection. The logistic regression analysis demonstrates that post-materialist values significantly influence the likelihood of prioritizing the environment over economic growth. Individuals with post-materialist values consistently show a higher tendency to prioritize environmental protection compared to materialists. Individuals with mixed values also show a greater inclination toward environmental priorities, balancing materialist and post-materialist perspectives. Post-materialists focus on self-expression, quality of life, and sustainability, prioritizing long-term issues like environmental protection. They support policies balancing economic growth with ecological preservation, reflecting altruistic goals. In contrast, materialists prioritize economic growth and physical security, showing less concern for environmental issues.

The logistic regression analysis highlights that individuals with mixed and post-materialist values are more likely to prioritize the environment over economic growth compared to materialists, with this trend varying across country income levels. The effect is strongest in upper-income countries and weakest in low-income countries. Post-materialist individuals consistently prioritize environmental concerns across all income groups, while mixed-value individuals show a moderate inclination, particularly in wealthier nations. The findings suggest that the influence of value orientation on environmental prioritization becomes more pronounced as country income levels increase. However, disparities in data availability, particularly in low-income countries, may affect the generalizability of these results.

To promote environmental protection, policies should focus on fostering post-materialist values through education and awareness campaigns, particularly in low- and middle-income countries where these values are less prevalent. Additionally, targeted interventions for mixed-value individuals should emphasize the interconnectedness of

environmental and economic priorities, while investments in data collection can enhance understanding of low-income countries' environmental attitudes. Integrating environmental concerns into economic policies, such as promoting green industries and renewable energy, can appeal to both materialist and mixed-value individuals by balancing ecological sustainability with economic growth. Behavioral nudges, such as incentives for recycling and energy conservation, can encourage sustainable choices among materialists. Wealthier nations should leverage their strong pro-environmental attitudes to lead global initiatives and support low-income countries with financial and technical assistance.

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