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Drivers of Pro-Ecological Behaviour Norms among Environmentalists, Hunters and the General Public

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Abstract: The processes of industrialisation and urbanisation have substantially severed our connection with nature, causing detrimental effects on our ecosystems that underline the urgent necessity for sustainability-driven transformations. However, the dedication to sustainable practices depends on various factors and differs among different groups. This study employs the Value–Belief–Norm Theory of Environmentalism to investigate the impact of the New Ecological Paradigm (NEP), Connectedness to Nature (CNS), agricultural land stewardship, age and gender identity on pro-ecological personal norms. Data collection took place in Malta, an island state characterised by competing pressures over its land use. To encompass diverse group viewpoints, purposive sampling techniques were utilised, engaging environmentalists, hunters, and representatives from the general public. The findings obtained from hierarchical multiple regression analysis highlight a noteworthy positive impact of NEP, CNS, agricultural land stewardship, and age, which collectively explain 40% of the variance in pro-ecological personal norms. The identification of these drivers can provide directions for facilitating the implementation of educational, environmental and legislative policies that can help nurture and foster a sustainable relationship between humans and nature.

Keywords: environmental sustainability; pro-ecological behaviour norms; new ecological paradigm; connectedness to nature; agricultural land stewardship

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1. Introduction

The Dominant Social Paradigm (DSP) of Western society has long provided values, beliefs and attitudes about social and environmental issues that allow individuals to interpret the meaning of the external world [1]. The DSP assumes that resources are limitless, continuous growth is positive, science and technology will solve any problems, private property rights are sacrosanct, and a laissez-faire economy is the only one to endorse [2]. However, the DSP is socially and environmentally unsustainable.

The need to address environmental challenges and promote sustainability has given rise to pro-ecological behaviour that encourages practices in various spheres that help sustainability, preserve biodiversity and conserve finite natural resources. In explaining individual pro-ecological behaviour the Value–Belief–Norm (VBN) Theory of Environmentalism [3,4] allows for the investigation of drivers in the form of values, beliefs and pro-ecological personal norms. Values can be of at least four types, while beliefs concern an ecological worldview as reflected in the New Ecological Paradigm (NEP) [5–7]. The author developing the VBN theory framework has called for an investigation of variables that support further development and a better understanding of pro-ecological behaviour [4] and several studies have been carried out, e.g., [8,9]. This research follows this call and considers the impact of both social–psychological and socio-demographic variables. The social–psychological drivers of pro-ecological personal norms considered consist of NEP as an important building block in the framework, together with Connectedness to Nature (CNS) and agricultural land stewardship. The role of agricultural land stewardship has

received scant attention in the literature. In addition, the effect of the socio-demographic variables for age and gender identity are also investigated.

Pro-ecological personal norms are critical as they drive individual pro-ecological actions. Social movements run by committed individuals together with ordinary supporters can highlight critical ecological issues, fostering collective action. These movements serve as catalysts for change, mobilising communities, raising awareness, and pressuring governments and corporations toward sustainable practices. Committed activists require sustained, low-commitment support, such as writing to politicians and accepting policies that may demand sacrifices [4]. Society, marked by diverse interest groups and social movements, often with contrasting views, operates within a general public with varying commitments. Thus, this research also focuses on whether group membership in three interest groups—environmentalists, hunters, and the general public—affects pro-ecological personal norms.

The research is undertaken in Malta—a small EU island state with a dense population, high building density, fragmented land holdings and a controversial migratory bird hunting tradition. This context possesses characteristics that lend themselves well to the intended investigation. Understanding NEP, CNS and agricultural land stewardship as drivers of pro-ecological personal norms across different interest groups is essential given the potential clashes of values and priorities of these different interest groups. While committed activists within social movements drive change and raise awareness, the broader population may be influenced by various factors, leading to varying levels of commitment to pro-ecological principles. This multifaceted landscape requires a nuanced exploration of how differing interest groups contribute to or hinder the cultivation of pro-ecological norms, ultimately influencing the trajectory of sustainable practices at both individual and societal levels. This research seeks to consider the intricate interplay between drivers of pro-ecological personal norms and diverse interest groups to inform environmental education initiatives and pro-ecological policies that foster a more ecologically responsible society.

2. Theoretical Framework and Driver Focus

The Value–Belief–Norm (VBN) Theory of Environmentalism [3,4] provides a causal chain that links values, beliefs and pro-ecological personal norms that drive individual pro-ecological behaviour—Figure 1. Each variable in the chain is expected to influence the next but may also directly influence others further down. Several studies have adopted the VBN framework to investigate pro-environmental behaviours. Examples include studies that have considered energy policy [10], sustainable transportation [11], and green transportation policy [12,13].

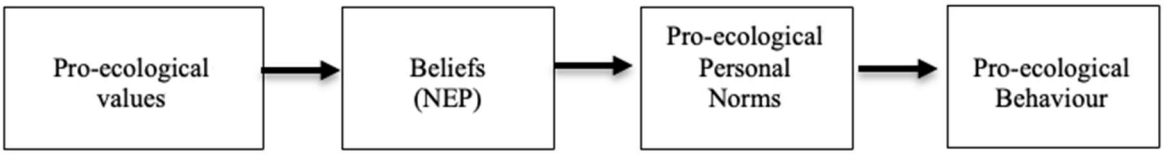

Figure 1. Schematic representation of VBN Theory of Environmentalism.

Each stage described in the schematic representation of the VBN framework and its relevance to the present research are considered further below.

2.1. Pro-Ecological Personal Norms and Pro-Ecological Behaviour

Pro-ecological personal norms are social standards that guide and precede actual behaviour. They represent informal prescriptions on how one should behave or think and are impacted by environmental beliefs [14,15]. VBN theory uses pro-ecological personal norms as the last stage before behaviour involving pro-ecological actions that can range from public activism to private sphere environmentalism. Such action is taken by people who pay close attention to the environment and society, and who believe that human activities and the fragile ecology are inseparable.

Researchers recognise that there is no one-to-one relationship between pro-ecological personal norms and actual observable pro-ecological behaviour because various psychosocial barriers and constraints can intervene [16,17]. The situation is the same as in the relationship between intention and actual behaviour in the Theory of Planned Behaviour [18]. Therefore, a VBN framework allows for the investigation of pro-ecological personal norms via questionnaires as a proxy measure for individual pro-ecological behaviour.

2.2. Beliefs (New Ecological Paradigm)

In VBN theory, beliefs concern an ecological worldview as reflected in the New Environmental Paradigm (NEP) [5–7], which originally brought together environmental issues rooted in the values, beliefs, and attitudes prevalent in American society in the 1970s. This emphasised responsible resource extraction and sharing, protecting the Earth from pollution, and ensuring the survival of others [6]. However, the concept of Sustainable Development (SD) in the late 1980s challenged the dichotomy between DSP and NEP and sought a synthesis between economic growth and environmental concern. As a result, a revised New Ecological Paradigm [7] was proposed, encompassing the original three facets, and adding two more: (1) humanity's ability to upset the fragility of nature's balance; (2) recognition of growth limitations; (3) antianthropocentrism; and (4) rejection of exemptionalism; and (5) acknowledgement of the possibility of an ecocrisis. The reconceptualisation of NEP necessitated a review of its operationalisation and the incorporation of item improvement based on usage experience [7]. Since its development, the NEP has been widely used across numerous countries. It captures generalised beliefs about nature and humans' relationship with the environment with high NEP scores indicating an individual who "sees the world ecologically" [7]. NEP represents important beliefs about the environment, which, in the context of VBN theory, give rise to an awareness of adverse consequences to valued objects and a realisation of a perceived ability to reduce the threat, resulting in pro-ecological personal norms [5]. Therefore:

H1. *The higher an individual's NEP score, the stronger that individual's pro-ecological personal norms will be.*

2.3. Values

Values represent overarching goals that serve as guiding principles in life and form an important basis for the development of all kinds of behaviour [19,20]. VBN theory identifies two positive (biospheric and altruistic) and two negative (egoistic and hedonistic) values that impact pro-ecological behaviour either directly or indirectly via NEP beliefs [21,22]. In line with the call to incorporate variables in the VBN framework that can help better understand and determine their impact on pro-ecological behaviour [4], this research focuses on Connectedness to Nature and agricultural land stewardship as two variables that impact values.

2.3.1. Connectedness to Nature

Connectedness to Nature (CNS) is a personality trait and has been defined as an "individual's trait levels of feeling emotionally connected to the natural world" that influences real-world intentions and decisions involving nature [22] (p. 503). Empirical evidence indicates that all humans have some degree of a genetically hard-wired affinity with nature [23]. Immersion in nature, whether rural or urban, actual or virtual, enhances CNS and leads to increased attentional capacity, positive emotions, and various psychological benefits to well-being [24–26]. Indeed, there is a growing realisation of the importance of the human–nature relationship with robust links to pro-environmental behaviour that influence not only our well-being but also our behaviour toward others and our willingness to sacrifice for them, e.g., [27–29]. Various authors have conceived of CNS in different ways, but all appear to relate to the same underlying affective concept, and despite some divergence among the measurement scales, these different approaches can be assumed to

be "*markers of a common core construct*" [30] (p. 66). The measure proposed by these same authors allows for the prediction of group identity, current interactions with nature, as well as attachment and a sense of interdependence with nature [30]. The literature recognises CNS as a predictor of environmental concern and pro-ecological behaviour [24,30–32]. In a VBN framework, it has been more specifically linked to the development of biospheric values [33] and NEP [8]. Therefore,

H2. *The higher an individual's CNS score, the stronger that individual's pro-ecological personal norms will be.*

2.3.2. Agricultural Land Stewardship

It has been noted that "experiences of real contact (with nature) are more easily able to generate positive affective states, generally of relaxation and restoration, which are more marked the greater the level of immersion in nature" [34] (p. 33). Despite being relatively overlooked in the literature, stewardship of agricultural land can play a significant role in conserving ecosystems, with private land owners reporting a responsibility to future generations and their families [35]. Individuals who have agricultural land stewardship responsibility have their values shaped by their direct exposure to nature [36], which, in a VBN framework, should impact their biospheric values and the development of pro-ecological personal norms. Therefore,

H3. *Individuals who have agricultural land stewardship will manifest a stronger impact on pro-ecological personal norms than those who do not hold stewardship of agricultural land.*

2.4. Groups and Pro-Ecological Personal Norms

Pro-ecological personal norms serve as the foundation for individual and collective pro-ecological actions that manifest themselves at both personal and societal levels. The emergence of social movements, steered by passionate activists and ordinary supporters alike, stands as a beacon of optimism. These movements play a pivotal role in drawing attention to pressing ecological concerns, galvanising collective efforts, and compelling governments and corporations to embrace sustainable practices. Nevertheless, the sustainability of such movements relies not only on fervent activism but also on a sustained form of support characterised by low-commitment active citizenship. This entails activities like writing to politicians, contributing funds, and endorsing public policies that may necessitate material sacrifices and behavioural changes in personal or private spheres [3].

The three focus groups—hunters, environmentalists, and the general public—exhibit contrasting priorities and notable similarities in their perspectives. Hunters place a high value on the enjoyment of bird hunting, primarily as a recreational pursuit [37]. Their relationship with nature is characterised by a direct, hands-on approach, reflecting a utilitarian connection to wildlife. In contrast, environmentalists place a strong emphasis on the conservation and protection of ecosystems. They underscore the intrinsic value of species within these ecosystems and are critical of activities perceived as prioritising short-term gains over long-term ecological health. The general public is inherently diverse and encompasses a spectrum of priorities, personal interests, economic considerations, and varying levels of environmental awareness. This diversity reflects the multifaceted nature of societal perspectives and resultant "images of nature" [38]. However, despite their differences, the three groups also share common ground in their appreciation of nature. Hunters express a profound connection to the outdoors, valuing the inherent link between nature and the enjoyment of hunting. Environmentalists appreciate ecosystems and advocate for the preservation of the natural world, emphasising the importance of maintaining ecological balance. The general public, in its entirety, holds a general appreciation for nature, albeit with varying degrees of engagement.

In the broader societal context, diverse interest groups and competing social movements coexist, often articulating disparate perspectives. This occurs within the backdrop of

a general public that is often not strongly aligned with any specific position. Consequently, this research delves into a second focus, aimed at determining whether group membership within three distinct interest groups—environmentalists and hunters representing opposing lobbies, along with the general public—affects the presence of pro-ecological personal norms. It is expected that environmentalists possess a positive emotional association with nature that leads to an expanded sense of self and greater valuing of diverse species, which are reflected in pro-ecological personal norms and behaviour. It is possible that hunters too have a positive emotional association with nature but undertake a negative appreciation of aspects of nature through hunting. Yet, they may still exhibit pro-ecological personal norms. The general public is likely to have the weakest emotional association with nature among the groups.

3. Method

The present research is exploratory and cross-sectional with descriptive, factor analysis and hierarchical regression analysis.

3.1. Participants and Procedure

Purposive samples were collected from three interest groups, consisting of environmentalists, hunters, and the general public. These were chosen because they represent important interest groups in Maltese society. Bird hunting in Malta has been the subject of a national referendum and remains a contentious issue that often sees environmentalists and hunters at loggerheads as they each seek to influence the broader voting general public. Many hunters also hold and tend agricultural land. Potential respondents from the three groups received a mail appeal that directed them to complete the questionnaire online. An active Federation representing the hunting and trapping lobby provided membership access so that 500 appeals were distributed among a sample of members, from whom 55 (11%) completed questionnaires were collected. The environmental lobby is fragmented and involves several organisations. Arrangements were made with five organisations that agreed to participate and 600 appeals were distributed in approximate proportion to membership of the five participating organisations, from whom 67 (11%) completed questionnaires were collected. In the case of the general public, 600 participants were chosen at random from the electoral register. The online questionnaire for this group included a filter question that asked whether intending respondents were members of an environmental organisation or practised hunting or trapping so that any such respondents could be excluded. A total of 65 (10.8%) valid responses were obtained, making up a total of 187 responses. Non-response error was investigated by comparing the first and last quartile means of the constructs for respondents in each group. The results provided support for acceptable levels of non-response error in the data collected.

3.2. Instruments

To capture pro-ecological personal norms, the Juster scale [39] suitably amended to reflect pro-ecological personal norms in its standard 11-point probability scale format, was used. In addition, eight specific pro-ecological personal norms items were added. These were identified following separate focus groups, each of nine persons, conducted with members from the environmental, hunter and general public groups. Each focus group discussed what participants thought constitutes pro-ecological personal norms. The common themes identified resulted in eight additional personal norm items (Table 1). These were scaled using a seven-point Likert-type scale that ranges from 1 = Strongly Disagree to 7 = Strongly Agree. To capture the New Ecological Paradigm, the 15-item NEP scale was employed, accompanied by five-point Likert scale response formats that range from 1 = 'Strongly Disagree', to 5 = 'Strongly Agree' [7]. CNS was captured by the 14-item CNS scale [22]. To avoid identical scaling for both the NEP and CNS and reduce the possibility of common method bias, a seven-point scale was instead used for CNS. The final research instrument consisted of nine pro-ecological personal norm items, the 15-item new NEP,

the 14-item CNS scale, a single item that asked about agricultural land stewardship in terms of whether respondents hold and tend to land, together with two demographic items for gender identity and age. Agricultural land in Malta is fragmented and consists of 10,281 holdings, out of which only 2.6% are of more than two hectares, while 78.4% are of less than 0.5 hectares. In terms of ownership, 49.6% of agricultural land is held as an agricultural lease from the State, 27.9% is owner occupied, and 22.5% is leased from private owners [40]. Agricultural laws provide security of tenure and agricultural leases are very difficult to terminate. Pilot testing of the final 41-item questionnaire supported its viability. The wording of all the items used appears in Table 2.

Table 1. Age, gender identity and agricultural land holdings by interest group.

		Hunters	Environmentalists	General Public	Total
N		55	67	65	187
Age		46.8 (sd = 12.0)	41.9 (sd = 18.2)	30.4 (sd = 12.8)	39.3 (sd = 16.2)
Gender identity	Male	55	30	23	80
	Female	0	37	42	107
Agri. Land Stewardship	Yes	47	31	5	83
	No	8	36	60	104

Table 2. Descriptive statistics and results of a factor analysis for the items of pro-ecological personal norms, NEP and CNS.

Item	Mean	SD	Factor Loading						
			1	2	3	4	5	6	7
PNA: What is the likelihood that you will take action to protect the environment in the coming months?	6.62	2.94	0.56						
PN1: Support the conservation of soils.	4.67	2.05	0.68						
PN2: Avoid trampling and compaction.	5.25	1.82	0.60						
PN3: Avoid littering and illegal dumping.	6.58	1.12	0.56						
PN4: Support and encourage tree growth.	5.95	1.59	0.71						
PN5: Support the control of building and urbanisation.	4.92	2.04	0.65						
PN6: Support educational campaigns about caring for the environment.	5.80	1.61	0.85						
PN7: Support better enforcement of environmental regulations and laws.	5.90	1.50	0.79						
PN8: Support an increase in the designation of national parks.	5.28	1.86	0.71						
Pro-ecological Personal Norms	50.97	11.79							
NEP1: We are approaching the limit of the number of people the Earth can support.	3.41	1.29				0.79			
NEP2: Humans have the right to modify the natural environment to suit their needs. (R)	3.40	1.34						0.70	
NEP3: When humans interfere with nature it often produces disastrous consequences.	3.84	1.17							0.70
NEP4: Human ingenuity will ensure that the Earth will remain habitable. (R)	2.93	1.16			0.44				
NEP5: Humans are severely abusing the environment.	4.29	1.04					0.49		
NEP6: The Earth has plenty of natural resources if we just learn how to develop them. (R)	1.65	1.03					0.56		
NEP7: Plants and animals have as much right as humans to exist.	4.26	1.14			0.50				
NEP8: The balance of nature is strong enough to cope with the impacts of modern industrial nations. (R)	3.90	1.11						0.77	
NEP9: Despite our special abilities, humans are still subject to the laws of nature.	4.49	0.78					0.60		
NEP10: The so-called "ecological crisis" facing humankind has been greatly exaggerated. (R)	3.62	1.20			0.50			0.41	
NEP11: The Earth is like a spaceship with very limited room and resources.	3.32	1.30				0.68			
NEP12: Humans were meant to rule over the rest of nature. (R)	3.60	1.44			0.76				
NEP13: The balance of nature is very delicate and easily upset.	4.06	1.04				0.56			
NEP14: Humans will eventually learn enough about how nature works to be able to control it.	3.25	1.13			0.61				
NEP15: If things continue their present course, we will soon experience a major ecological catastrophe.	3.97	1.12				0.50			

Table 2. *Cont.*

Item	Mean	SD	Factor Loading						
			1	2	3	4	5	6	7
New Ecological Paradigm (NEP)	54.01	7.48							
CN1: I often feel a sense of oneness with the natural world around me.	5.44	1.46		0.71					
CN2: I think of the natural world as a community to which I belong.	5.81	1.34		0.77					
CN3: I recognise and appreciate the intelligence of other living organisms.	6.16	1.16		0.65					
CN4: I often feel connected to nature.	5.89	1.27		0.82					
CN5: When I think of my life, I imagine myself to be part of a larger cyclical process of living.	5.76	1.45		0.78					
CN6: I often feel a kinship with animals and plants.	5.39	1.68		0.83					
CN7: I feel as though I belong to the Earth as equally as if it belongs to me.	5.35	1.60		0.83					
CN8: I have a deep understanding of how my actions affect the natural world.	5.79	1.24		0.65					
CN9: I often feel part of the web of life.	5.43	1.44		0.83					
CN10: I feel that all inhabitants of Earth, human and nonhuman, share a common "life force".	5.60	1.49		0.68					
CN 11: Like a tree can be part of a forest, I feel embedded within the broader natural world.	5.40	1.50		0.85					
CN 12: When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature. (R)	4.33	1.99			0.71				
CN 14: My personal welfare is independent of the welfare of the natural world. (R)	4.64	2.05							60
Connectedness to Nature (CNS)	70.27	12.52							

Note. The extraction method was principal component factor analysis followed by a varimax rotation. Factor loadings of less than 0.4 are not shown. Reverse-scored items are denoted by an (R).

3.3. Design

Cross-sectional data were collected from Malta. The island state is the smallest of the 27 members that make up the European Union (EU) and has a total surface area of 316 km^2 and a high population density of 1628 persons per km^2 [41]. Given its size, Malta's challenge is to continue to improve living standards while safeguarding agricultural and natural habitats that make it distinctive, unique, and Mediterranean. It offers an interesting microcosm where environmental issues are increasingly important and regularly face competing pressures. Migratory bird hunting and trapping of birds is a pursuit that has been practised for generations, with some 17,000 registered hunters and trappers, representing 3.7% of the entire population [42]. Although some regulation of migratory bird hunting and trapping existed before Malta's membership of the EU in 2004, membership has brought increased pressure for stricter regulation. A similar situation arises with building development, as economic growth has seen significant building expansion. However, since the balance between the two main political parties in parliamentary elections is often relatively small, the hunting, developers and other lobbies have a disproportionate influence. The political duality and the balancing act involved make for a situation that is challenging and interesting to understand.

4. Results

The respondents were 57.2% men; the average age was 39.3 (sd = 16.2) and 44.4% reported agricultural land stewardship. This latter is rather high in Malta because agricultural land is inherited within members of a family, resulting over time in a relatively high number of small agricultural land holdings. Table 1 provides a breakdown by age, gender identity and agricultural land stewardship for the three interest groups considered.

Common method variance among the constructs investigated was tested using Harman's single-factor test [43]. The results of an unrotated principal component analysis of items collected showed clear factors with no evidence of a single dominant factor, indicating that common method variance is within acceptable levels.

An initial screening of all the data for kurtosis and skewness and possible outliers was undertaken. A single respondent from the hunters' group was found to be a marked outlier and was eliminated. Negatively worded items were reverse-scored, and summary statistics appear in Table 2. The initial screening of the data for principal component factor analysis consisting of all the pro-ecological personal norms, NEP and CNS items provided a KMO of 0.83, which is in the 'meritorious' range [44], while Bartlett's test of sphericity provided an

χ^2 of 3224.6 ($p < 0.001$). The KMO measure tests the sampling adequacy of individual and collective items used, while Barlett's sphericity test investigates whether several samples have equal variance. These results indicate that the data have sufficient correlations to allow for useful results from factor analysis. Therefore, a principal component factor analysis followed by a varimax rotation was undertaken to investigate the dimensionality and internal validity of the multiple items that sought to capture the constructs employed. After the deletion of item CN15 that loaded on multiple factors, the results shown in Table 2 provided three clear sets of loadings corresponding to the intended constructs in the study, providing support for discriminant validity. The influence of negatively worded questions in both NEP and CNS results in the creation of separate sub-factors that are simply an artefact resulting from the nature of the negatively worded items [45]. Pro-ecological personal norms and CNS are quite clearly unidimensional constructs, while the convergent validity of NEP is a little more problematic. Here, the pattern of loadings is rather different from that reported in the original scale [7] (p. 435, Table 2) but is like that reported for Turkey [46] (p. 1028, Table 4). Therefore, while the findings can be said to support the unidimensionality of the constructs, the absence of clear and stable dimensions across different cultures suggests some concern with the convergent validity of the NEP.

Internal consistency using Cronbach alpha reliability resulted in values of 0.86 for pro-ecological personal norms, 0.68 for NEP and 0.88 for CNS. Pro-ecological personal norms and CNS comfortably exceed the recommended threshold of 0.70 [47]. However, studies of the NEP outside of the United States have tended to display weaker internal consistency [6]. Correlations of NEP to CNS ($r = 0.37$; $p < 0.001$) and pro-ecological personal norms ($r = 0.31$; $p < 0.001$), and CNS with pro-ecological personal norms ($r = 44$; $p < 0.001$) are statistically significant.

Before undertaking hierarchical multiple regression analysis, the relevant assumptions in terms of sample size, assumption of singularity, correlations, collinearity and Mahalanobis distance scores together with assumptions of normality, linearity, and homoscedasticity were tested and satisfied. This allowed for the paced evaluation in step 1 of the role of the three interest groups with pro-ecological personal norms, followed in step 2 by that of NEP and CNS, in step 3 by whether respondents have agricultural land stewardship and finally in step 4 by gender identity and age.

The results from the first step analyses of the interest groups consisting of two dummy variables to represent the three interest groups are statistically significant, accounting for 24% of the variation in pro-ecological personal norms. In the second step, NEP and CNS are found to impact pro-ecological personal norms, providing support for H1 and H2. In step 3, the dichotomous dummy variable for whether respondents have agricultural land stewardship was statistically significant, providing a small but significant increase in R^2 that provides support for H3. In the final step, the demographic variable for age last birthday and a dichotomous dummy variable for gender identity were added. Age is statistically significant but not gender identity, with a resulting further 4% increase in R^2 to 40%. The inclusion of age dilutes the standardised regression coefficient for environmentalists, which, however, remains significant. Therefore, in the final stage, no difference between hunters and the general public remains, but environmentalists exhibit the highest levels of pro-ecological personal norms—Table 3.

Table 3. Results from hierarchical regression analyses for variables predicting pro-ecological personal norms.

				Unstd. Coefficient		Std. Coefficient	
Predictor	R^2	ΔR^2	**F**	**B**	**SE B**	**β**	***t***
Step 1	0.24	0.24 ***	27.81 ***	-	-	-	-
Constant	-	-	-	43.49	1.28	-	33.95 ***
Hunters	-	-	-	10.34	1.91	0.40	5.41 ***
Environmentalists	-	-	-	12.80	1.81	0.52	7.09 ***

Table 3. *Cont.*

Predictor	R^2	ΔR^2	F	Unstd. Coefficient		Std. Coefficient	
				B	SE B	β	*t*
Step 2	0.35	0.12 ***	24.38 ***	-	-	-	-
Constant	-	-	-	12.99	6.04	-	2.15 *
Hunters	-	-	-	9.03	1.90	0.35	4.75 ***
Environmentalists	-	-	-	8.85	1.81	0.36	4.88 ***
NEP	-	-	-	0.26	0.11	0.17	2.31 *
CNS	-	-	-	0.26	0.07	0.28	3.98 ***
Step 3	0.37	0.01 *	20.64 ***	-	-	-	-
Constant	-	-	-	13.87	6.00	-	2.31 *
Hunters	-	-	-	6.21	2.35	0.24	2.65 **
Environmentalists	-	-	-	7.61	1.90	0.31	4.00 ***
NEP	-	-	-	0.25	0.11	0.16	2.17 *
CNS	-	-	-	0.25	0.06	0.27	3.95 ***
Agri. Stewardship	-	-	-	3.63	1.81	0.15	2.01 *
Step 4	0.40	0.04 **	16.87 ***	-	-	-	-
Constant	-	-	-	12.57	6.45	-	1.95 *
Hunters	-	-	-	-	-	-	ns
Environmentalists	-	-	-	6.22	1.92	0.26	3.23 ***
NEP	-	-	-	0.25	0.11	0.16	2.24 *
CNS	-	-	-	0.21	0.07	0.22	3.19 **
Agri. Stewardship	-	-	-	3.89	1.77	0.17	2.20 *
Gender Identity	-	-	-	-	-	-	ns
Age last birthday	-	-	-	0.15	0.05	0.21	3.18 **

Note. B, unstandardised beta; SE, standard error; β, standardised beta; *t*, *t*-test; F, F statistic; R^2, variance; ΔR^2, change in variance; NEP, New Ecological Paradigm; CNS, Connectedness to Nature; Agri Stewardship, Agricultural Land Stewardship. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, ns = not significant.

5. Discussion

The first focus of this study was the effect of some social–psychological and socio-demographic variables on pro-ecological social norms in the context of the island state of Malta using a VBN theory framework.

The finding as proposed in H1 of a positive impact of NEP on pro-ecological personal norms is in line with VBN theory. The hierarchical regression results in Table 3 show NEP as an important and stable driver ($\beta = 0.16$; $p < 0.05$) of pro-ecological personal norms. This link is supported in the original VBN theory developed and tested in Western countries e.g., [4] and more broadly in places like Mongolia [48], Malaysia [49], and Taiwan [50]. It is now also supported in the context of Malta as a small island state.

In VBN theory, CNS has been directly or indirectly linked to biospheric values, NEP and pro-ecological behaviour [8,24,30–34]. Our findings provide support for H2 and the positive impact of CNS on pro-ecological personal norms. The effect on pro-ecological norms is likely indirect via biospheric values and NEP. Interestingly, the addition of the land stewardship variable in H3 as a driver of pro-ecological personal norms is also supported. Indeed, the addition of the land stewardship variable in step 3 of the hierarchical regression analyses does not significantly weaken the standardised beta value for the effect of CNS on pro-ecological personal norms ($\beta = 0.22$; $p < 0.01$ in step 4). Support for H3 underlines the importance of the land stewardship variable ($\beta = 0.17$; $p < 0.05$) and underscores the significance of individuals with agricultural land stewardship. These individuals are closely connected to the land and are likely to have a better appreciation of nature and its delicate balance. It suggests that the agricultural land stewardship variable is an overlooked, distinct and independent variable, worthy of further concept development and research of its effect in a VBN framework. The agricultural land stewardship variable captures the notion that farmers form an emotional attachment to their property that goes beyond its

value to grow crops and tend to livestock. This emotional attachment leads to an expanded sense of self and greater valuing of non-human species [51]. In a VBN theory context, the impact of agricultural land stewardship on pro-ecological personal norms is likely to occur via biospheric values.

This research also considered the effect of the socio-demographics of age and gender identity on pro-ecological personal norms. A cross-national examination across 22 national contexts of gender variation in environmental behaviour reveals moderate gender identity distinctions between males and females. Women tend to engage more in environmental behaviour, particularly in private environmental behaviour, and this is more consistent among nations at the upper end of the wealth distribution [52]. In the circumstances of this research conducted in Malta, a medium-wealth island state, gender identity was not found to have a significant impact on pro-ecological personal norms.

However, unlike in the case of gender identity, age has a strong positive impact on pro-ecological personal norms ($\beta = 0.21$; $p < 0.01$). The age-related result is noteworthy, suggesting that older respondents exhibit heightened interest in pro-ecological activities. This is supported by the recent literature, which, through a study of 31 more developed countries reflecting a mean GDP per capita of USD 25,441 (sd 17,565) in constant 2005 dollars, shows that older people are more likely to participate in environmental behaviour and the elderly are more likely to behave sustainably [53]. In the case of the latter, the literature also shows that older individuals exhibit a stronger relationship for one aspect of sustainability relating to better waste management behaviour [54]. Malta's economic development on a GDP per capita basis is in the range indicated above. Economic development is reflected in Malta's evolving landscape with older generations able to vividly recall a less developed island, set within a wider rural backdrop and characterised by fewer tourists, buildings, and traffic.

A second focus of the research was to determine whether group membership within three distinct interest groups—environmentalists and hunters representing opposing lobbies, along with the general public—affects the presence of pro-ecological personal norms. The results support the idea that environmentalists possess an emotional association with nature and emerge as exhibiting positive pro-ecological personal norms. The results of the hierarchical regression analysis show that until step 2, the hunter group variable is significant and hunters also exhibit pro-ecological personal norms. However, with the addition of agricultural stewardship in step 3 and age in step 4, the hunter group variable first weakens and then no longer impacts pro-ecological personal norms. This finding suggests no fundamental difference between hunters and the general public in their pro-ecological personal norms. The characteristics of the samples for the three groups shown in Table 1 indicate that most hunters (85.5%) in the sample are land-owning farmers and their average age is the highest among the three sample groups. It is these characteristics rather than the fact that they are hunters that impact their pro-ecological personal norms.

6. Conclusions

The findings contribute to VBN theory development, supporting the relevance of the social–psychological and socio-demographic constructs considered, which, except for gender identity, all impact pro-ecological personal norms. In particular, they highlight the overlooked role that agricultural land stewardship plays and the relevance of age as drivers of pro-ecological personal norms. In addition, the identification of diverse interest groups in a population provides a further useful understanding of the dynamics at play. The identification of different drivers of pro-ecological personal norms and an understanding of the role of diverse interest groups in society serve as a useful foundation for facilitating the implementation of educational, environmental and legislative policy.

Nature education programmes can induce in society reality-changing practices that are not just focused on internalising the environmental dimension but also on the promotion of new environmental rationality [55]. A better understanding of drivers of pro-ecological personal norms allows for improved targeting of educational and communication activities

in support. Environmental agencies and environmental groups can undertake activities aimed at improving CNS and NEP targeted at adult males and females [56], youths [57], and children [58]. These activities can all aim at generating an appreciation of how humans fit with nature. These activities can take various forms and can include informative expert-led talks and excursions to nature locations that foster an appreciation of nature's many facets, informative programmes on TV, write-ups on nature blogs and social media, nature restoration field trips, together with solitary or group pursuits involving star gazing at night, outdoor camping, and growing trees from seeds.

Given the relevance of the agricultural land stewardship variable, the government can consider introducing incentives for farmers and landowners to pursue sustainable land stewardship practices. Incentives could take the form of tax benefits for implementing eco-friendly agricultural practices, preserving biodiversity, and fostering a strong connection with the land. It can also consider introducing legislation recognising and protecting emotional attachment to the land, particularly for farmers who lease state land that they have held for generations. The emotional connection to land can also be incorporated into land-use planning and conservation policies, acknowledging its role in fostering a greater appreciation of nature.

The heightened interest in pro-ecological activities exhibited by older individuals [53] suggests the possibility of devising age-responsive environmental policies. These could take the form of community-based initiatives that leverage the experience and knowledge of older individuals. Although gender identity did not show significant differences in Malta, gender-specific environmental initiatives that recognise their tendency to engage more in private environmental activities [52] can be considered.

It is also possible to move away from the confrontational stance often pursued by NGOs representing environmentalists and hunters to pursue collaborative policy making that recognises the common desire to defend existing nature. This will necessitate the setting up of formal platforms for dialogue that respect and represent the diverse range of perspectives of different groups.

7. Limitations and Future Research

While this study provides valuable insights into the drivers of pro-ecological personal norms in Malta, it has certain limitations. First, this research adopts a positivist cross-sectional survey sampling approach, which allows for empirical testing but sacrifices breadth and depth of understanding of complexity. Second, although 40% of the variance in pro-ecological personal norms is explained, it suffers from specification error and the potential presence of additional drivers needs to be borne in mind. Third, purposeful sampling was undertaken and the resulting sample size is not large; therefore, any generalisations need to be undertaken with caution. Fourth, the results pertain to the situation in Malta and replication in other contexts may result in variations. Finally, in looking at drivers of pro-ecological personal norms using a VBN framework, moderating and mediating effects were not considered.

These limitations in themselves provide useful pointers for future research. An investigation of effects across interest groups can alternatively be undertaken using an experimental methodology and additional drivers for pro-ecological personal norms can be considered. However, researchers need to guard against content overlap among concepts and be wary of the assumption that measures with different names necessarily measure different concepts [23]. The results obtained for the effect of NEP on pro-ecological personal norms may be impacted by concerns regarding the psychometric properties of the NEP measure. The problem appears to be related to the negatively worded items, and this is an aspect that has been highlighted by other non-US researchers e.g., [44]. The NEP scale requires improved conceptualisation and operationalisation with a more stable factor structure across countries [59]. Only when cross-cultural equivalence is better supported can researchers comfortably compare results obtained in one country with those obtained in another. Finally, it is possible to consider the constructs used in this study together with

others to develop a multi-stage model that would investigate moderating and mediating effects to understand pro-ecological personal norms using a VBN theory framework.

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References

1. Gollnhofer, J.F.; Schouten, J.W. Complementing the dominant social paradigm with sustainability. *J. Macromarketing* **2017**, *37*, 143–152. [CrossRef]
2. Deng, J.; Walker, G.J.; Swinnerton, G. A Comparison of Environmental Values and Attitudes Between Chinese in Canada and Anglo-Canadians. *Environ. Behav.* **2006**, *38*, 22–47. [CrossRef]
3. Stern, P.C.; Dietz, T.; Abel, T.; Guagnano, G.A.; Kalof, L. A value-belief-norm theory of support for social movements: The case of environmental concern. *Hum. Ecol. Rev.* **1999**, *6*, 81–97.
4. Stern, P.C. Toward a coherent theory of environmentally significant behavior. *J. Soc. Issues* **2000**, *56*, 407–424. [CrossRef]
5. Dunlap, R.E.; Van Liere, K.D. The "New environmental paradigm: A proposed measuring instrument and preliminary results. *J. Environ. Educ.* **1978**, *9*, 10–19. [CrossRef]
6. Dunlap, R.E. The new environmental paradigm scale: From marginality to worldwide use. *J. Environ. Educ.* **2008**, *40*, 3–18. [CrossRef]
7. Dunlap, R.E.; Van Liere, K.D.; Mertig, A.G.; Jones, R.E. Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Soc. Sci. Q.* **2000**, *56*, 425–442.
8. Areias, S.; Disterheft, A.; Gouveia, J.P. The role of connectedness in pro-environmental consumption of fashionable commodities. *Sustainability* **2023**, *15*, 1199. [CrossRef]
9. Sierra-Barón, W.; Olivos-Jara, P.; Gómez-Acosta, A.; Navarro, O. Environmental identity, connectedness with nature, and well-being as predictors of pro-environmental behavior, and their comparison between inhabitants of rural and urban areas. *Sustainability* **2023**, *15*, 4525. [CrossRef]
10. Steg, L.; Dreijerink, L.; Abrahamse, W. Factors influencing the acceptability of energy policies: A test of VBN theory. *J. Environ. Psychol.* **2005**, *25*, 415–425. [CrossRef]
11. Zhang, L.; Sheng, L.; Zhang, W.; Zhang, S. Do personal norms predict citizens' acceptance of green transport policies in China? *Sustainability* **2020**, *12*, 5090. [CrossRef]
12. Zhang, W.; Adaviah, M.; Sulaiman, Z. Moderating effect of collectivism on Chinese consumers' intention to adopt electric vehicles—An adoption of VBN framework. *Sustainability* **2022**, *14*, 12398. [CrossRef]
13. Jakovcevic, A.; Steg, L. Sustainable transportation in Argentina: Values, beliefs, norms and car use reduction. *Transp. Res. Part F Traffic Psychol. Behav.* **2013**, *20*, 70–79. [CrossRef]
14. Schwartz, S.H. Normative influences on altruism. In *Advances in Experimental Social Psychology*; Berkowitz, L., Ed.; Academic Press: New York, NY, USA, 1977; Volume 10, pp. 222–280.
15. Stern, P.C.; Dietz, T. The value basis of environmental concern. *J. Soc. Issues* **1994**, *50*, 65–84. [CrossRef]
16. Rui, G. Understanding the reasons for behavioral failure: A process view of psychosocial barriers and constraints to pro-ecological behavior. *Sustainability* **2013**, *5*, 2960–2975.
17. Hines, J.M.; Hungerford, H.R.; Tomera, A.N. Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. *J. Environ. Educ.* **1987**, *18*, 1–8. [CrossRef]
18. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [CrossRef]
19. Schwartz, S.H. Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Adv. Exp. Soc. Psychol.* **1992**, *25*, 1–65.

20. De Groot, J.I.; Steg, L. Value orientations to explain beliefs related to environmental significant behavior: How to measure egoistic, altruistic, and biospheric value orientations. *Environ. Behav.* **2008**, *40*, 330–354. [CrossRef]
21. Steg, L. Values, norms, and intrinsic motivation to act proenvironmentally. *Annu. Rev. Environ. Resour.* **2016**, *41*, 277–292. [CrossRef]
22. Mayer, F.S.; Frantz, C.M. The connectedness to nature scale: A measure of individuals' feeling in community with nature. *J. Environ. Psychol.* **2004**, *24*, 503–515. [CrossRef]
23. Milfont, T.L. The differential psychology of environmental protection. *PsyEcology* **2021**, *12*, 398–427. [CrossRef]
24. Mayer, F.S.; McPherson Frantz, C.; Bruehiman-Senecal, E.; Dolliver, K. Why is nature beneficial? The role of connectedness to nature. *Environ. Behav.* **2008**, *41*, 607–643. [CrossRef]
25. Frost, S.; Kannis-Dymand, L.; Schaffer, V.; Millear, P.M.; Allen, A.; Stallman, H.; Mason, J.; Wood, A.; Atkinson-Nolte, J. Virtual immersion in nature and psychological well-being: A systematic literature review. *J. Environ. Psychol.* **2022**, *80*, 101765. [CrossRef]
26. Willis, K.; Gupta, A. Place-keeping in the park: Testing a living lab approach to facilitate nature connectedness in urban greenspaces. *Sustainability* **2023**, *15*, 9930. [CrossRef]
27. Lengieza, M.L.; Aviste, R.; Richardson, M. The Human—Nature relationship as a tangible target for Pro-Environmental Behaviour—Guidance from interpersonal relationships. *Sustainability* **2023**, *15*, 12175. [CrossRef]
28. Neaman, A.; Pensini, P.; Zabel, S.; Otto, S.; Ermakov, D.S.; Dovletyarova, E.A.; Burnham, E.; Castro, M.; Navarro-Villarroel, C. The prosocial driver of ecological behavior: The need for an integrated approach to prosocial and environmental education. *Sustainability* **2022**, *14*, 4202. [CrossRef]
29. Sheffield, D.; Butler, C.W.; Richardson, M. Improving nature connectedness in adults: A meta-analysis, review and agenda. *Sustainability* **2022**, *14*, 12494. [CrossRef]
30. Tam, K.-P. Concepts and measures related to connection to nature: Similarities and differences. *J. Environ. Psychol.* **2013**, *34*, 64–78. [CrossRef]
31. Davis, A.C.; Stroink, M.L. The relationship between systems thinking and the new ecological paradigm. *Syst. Res. Behav. Sci.* **2016**, *33*, 575–586. [CrossRef]
32. Liu, T.; Geng, L.; Ye, L.; Zhou, K. "Mother nature" enhances connectedness to nature and pro-environmental behavior. *J. Environ. Psychol.* **2019**, *61*, 37–45. [CrossRef]
33. Martin, C.; Czellar, S. Where do biospheric values come from? A Connectedness to Nature perspective. *J. Environ. Psychol.* **2017**, *52*, 56–68. [CrossRef]
34. Mena-Garcia, A.; Olivos, P.; Loureiro, A.; Navarro, O. Effects of contact with nature on connectedness, environmental identity and evoked contents. *PsyEcology* **2020**, *11*, 21–36. [CrossRef]
35. Rodriguez, S.L.; Peterson, M.N.; Cubbage, F.W.; Sills, E.O.; Bondell, H.D. What is Private Land Stewardship? Lessons from Agricultural Opinion Leaders in North Carolina. *Sustainability* **2018**, *10*, 297. [CrossRef]
36. Schultz, P.W.; Shriver, C.; Tabanico, J.J.; Khazian, A.M. Implicit connections with nature. *J. Environ. Psychol.* **2004**, *24*, 31–42. [CrossRef]
37. Chang, C.H.; Barnes, M.L.; Frye, M.; Zhang, M.; Quang, R.-C.; Reisman, L.M.-G.; Levin, S.A.; Wilcove, D.S. The pleasures of pursuit: Recreational hunters in rural Southwest China exhibit low exit rates in response to declining catch. *Ecol. Soc.* **2017**, *22*, 43. [CrossRef] [PubMed]
38. Buijs, A.E. Lay people's images of nature: Comprehensive frameworks of values, beliefs, and value orientations. *Soc. Nat. Resour.* **2009**, *22*, 417–432. [CrossRef]
39. Juster, F.T. Consumer buying intentions and purchase probability: An experiment in survey design. *J. Am. Stat. Assoc.* **1966**, *61*, 658–696. [CrossRef]
40. NSO National Statistics Office, Malta, Census of Agriculture. 2020. Available online: https://nso.gov.mt/themes_publications/agricensus-2020/ (accessed on 29 July 2023).
41. NSO National Statistics Office, Malta. 2020. Available online: https://nso.gov.mt/Home/selected_indicators/Pages/Selected-Indicators.aspx (accessed on 31 May 2021).
42. FACE The European Federation of Associations for Hunting and Conservation, Hunting in Malta. 2004. Available online: http://www.face.eu/sites/default/files/malta_en.pdf (accessed on 12 August 2021).
43. Podsakoff, P.M.; MacKenzie, S.B.; Lee, J.-Y.; Podsakoff, N.P. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psychol.* **2003**, *88*, 879–903. [CrossRef]
44. Kaiser, H.F.; Rice, J. Little Jiffy, Mark IV. *Educ. Psychol. Meas.* **1974**, *34*, 111–117. [CrossRef]
45. Schmitt, N.; Stults, D.M. Factors defined by negatively keyed items: The result of careless respondents? *Appl. Psychol. Meas.* **1985**, *9*, 367–373. [CrossRef]
46. Erdoğan, N. Testing the new ecological paradigm scale: Turkish case. *Afr. J. Agric. Res.* **2009**, *4*, 1023–1031.
47. Nunnally, J.C. *Psychometric Theory*; McGraw-Hill: New York, NY, USA, 1967.
48. Liu, X.; Zou, Y.; Wu, J. Factors influencing public-sphere pro-environmental behavior among Mongolian college students: A test of Value-Belief-Norm theory. *Sustainability* **2018**, *10*, 1384. [CrossRef]
49. Chua, K.B.; Quoquab, F.; Mohammad, J.; Basiruddin, R. The mediating role of new ecological paradigm between value orientations and pro-environmental personal norm in the agricultural context. *Asia Pac. J. Mark. Logist.* **2016**, *28*, 323–349. [CrossRef]

50. Mei-Fang, C. An examination of the value-belief-norm theory model in predicting pro-environmental behaviour in Taiwan. *Asian J. Soc. Psychol.* **2015**, *18*, 145–151.
51. Gosling, E.; Williams, K.J.H. Connectedness to nature, place attachment and conservation behaviour: Testing connectedness theory among farmers. *J. Environ. Psychol.* **2010**, *30*, 298–304. [CrossRef]
52. Hunter, L.M.; Hatch, A.; Johnson, A. Cross-National Gender Variation in Environmental Behaviors. *Soc. Sci. Q.* **2004**, *85*, 677–694. [CrossRef]
53. Wang, Y.; Hao, F.; Liu, Y. Pro-Environmental Behavior in an Aging World: Evidence from 31 Countries. *Int. J. Environ. Res. Public Health* **2021**, *18*, 1748. [CrossRef]
54. Swami, V.; Chamorro-Premuzic, T.; Snelgar, R.; Furnham, A. Personality, individual differences, and demographic antecedents of self-reported household waste management behaviours. *J. Environ. Psychol.* **2011**, *31*, 21–26. [CrossRef]
55. Schutz-dos-Santos, I.; Kuhnen, A. Measuring functions and structure of environmental attitudes from environmental educators in public sanitation. *PsyEcology* **2022**, *13*, 1–28. [CrossRef]
56. Carr, V.; Hughes, J. Predicting the development of adult nature connection through nature activities: Developing the evaluating nature activities for connection Tool. *Front. Psychol.* **2021**, *12*, 618283. [CrossRef] [PubMed]
57. Szczytko, R.; Stevenson, K.T.; Peterson, M.N.; Bondell, H. How combinations of recreational activities predict connection to nature among youth. *J. Environ. Educ.* **2020**, *51*, 462–476. [CrossRef]
58. Cheng, J.C.H.; Monroe, M.C. Connection to nature: Children's affective attitude toward nature. *Environ. Behav.* **2012**, *44*, 31–49. [CrossRef]
59. Rosa, C.D.; Collado, S.; Profice, C.C. Measuring Brazilians' environmental attitudes: A systematic review and empirical analysis of the NEP scale. *Curr. Psychol.* **2021**, *40*, 1298–1309. [CrossRef]