

THE EFFECTS OF ENVIRONMENTAL KNOWLEDGE AND SOCIO-DEMOGRAPHIC FACTORS ON PRO-ENVIRONMENTAL BEHAVIOR IN MANDALAY

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Abstract

The purpose of this study was to investigate the effects of environmental knowledge, and socio-demographic factors on pro-environmental behavior in Mandalay, Myanmar. This study examined the effects of environmental knowledge and socio-demographic factors on pro-environmental behavior by surveying a sample of 280 (162 women and 118 men) respondents from Chanayetharzan, Chanmyatharsi, Aungmyatharzan and Mahaangmye in Mandalay. As hypothesized, women's engaging in private environmental behaviors was even significantly higher than that of men. Results indicated that older respondents engaged slightly more in public environmental behaviors but less in private environmental behavior. Moreover, environmental knowledge was significantly correlated with pro-environmental behavioral.

Introduction

Environmentalism emerged as a global phenomenon in the late 1960s and early 1970s (Buttel 2002; Mering et al. 2002). Since then, scholars have recognized the fundamental importance of exploring how knowledge, beliefs, and attitudes influenced human response to ecological degradation and pollution (Maloney et al. 1975). This awareness led to less public support for the human exemptionalism paradigm (HEP), the notion that humans are free to do as they please because they are exempt from the laws of nature (Catton & Dunlap, 1978a; Dunlap & Michelson, 2002). Endorsing the HEP implied thinking: (1) humans are separate from environments, (2) environments have only instrumental value, (3) environmental resources are inexhaustible, and (4) humans can control environments (Dunlap & Michelson 2002).

Environmental knowledge can be general in nature such as awareness of environmentally friendly products or more specific knowledge on issues such as recycling. Research indicates that consumers who have greater knowledge are more likely to act in a positive way (Thøgersen, 2000). However, several studies found no direct relationship between factual environmental knowledge and environmental behavior (Maloney and Ward 1973; Schahn and Holzer 1990).

Kollumuss and Agyemann (2002) also suggested that "Environmental Knowledge," influences on pro-environmental behavior in an indirect way. The task of "Knowledge" is to affect the factor "Environmental Attitudes and Values" and this leads to positive or negative environmental behavior. The variable "Knowledge" is often used in campaigns to improve environmental awareness or behavior. According to Schahn and Giesinger (1993), although there is no direct influence of knowledge, it is a necessary variable because pro-environmental action is only possible if people know what they can or could do. Without this knowledge, there will be no chance to act in an environmentally friendly way.

Several socio-demographic factors may also be correlated with pro-environmental behavior. Females are more likely to engage in pro-environmental behavior due to cultural and

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social-structural factors that make them on average more aware of the interconnections between causes and consequences of environmental harm (Stren et al. 1993; Hunter et al. 2004). More educated people are more likely to engage in pro-environmental behavior because they are exposed to more information about environmental harm through schooling (Scott & Willits, 1994).

In a recent study, Xiao & Hong (2010) examined the relationship between environmental behavior and environmental knowledge. In their study, education and environmental knowledge were the two strongest predictors across models. Respondents with higher education and more environmental knowledge tended to have significantly greater participation in all environmental behaviors. Another recent study by Hong and Xiao (2007a) used a modified version of the 2000 NEP Scale and examined gender differences, using a national sample of the urban population in China. Bivariate analyses revealed higher levels of environmental concern among men, although a subsequent path analysis found that men's higher environmental concern was attributed largely to their relatively higher environmental knowledge. They also found that older and higher-educated respondents tended to be more pro-environment.

Globalization has made expanding this research into international and non-western contexts absolutely essential, and Myanmar is also important place for this research.

Myanmar is one of the developing countries in the world, with a population of approximately 60 million people. Myanmar is rich in natural resources (land and water, biodiversity, minerals and forest resources). However, unsustainable resource exploitation is further adding to the country's development challenges and results in severe environmental degradation, particularly in the form of deteriorating soil quality due to overuse or misuse of land, compounded by widespread deforestation. People whose livelihoods depend most on natural resources find access to them restricted and their environment increasingly degraded. In urban areas, wastewater and solid waste disposal practices are linked to environmental problems. (UNICEF: Child-friendly Schools in Area-Focused Townships in Myanmar, 2003).

The state of environmental degradation in Myanmar warrants a close look at factors affecting environmental behavior among Myanmar citizens. Less research has addressed predictors of pro-environmental behavior in Myanmar than Western countries, however, behavior is the ultimate concern of conservationists. Further, little is known about the effect of urban size on pro-environmental behavior in Myanmar, although people living in different size cities usually face different levels of environmental deterioration due to different stages of economic growth.

In this study, we will examine the relationship between pro-environmental behavior and its socio-demographic predictors in Mandalay. In addition to the socio-demographic predictors that will be used in previous studies abroad, we will assess the impacts of knowledge on pro-environmental behavior. Our findings may provide important implications for managing environmental challenges in Mandalay, and the approaches we used may be applicable elsewhere.

On the basis of the available literature, the following hypotheses were formulated:

Hypothesis 1: Older respondents will be more likely to behave pro-environmental behaviour, compared with Younger respondents.

Hypothesis 2: Female respondents will be more likely to behave pro-environmental behaviour, compared with Male respondents.

Hypothesis 3: Respondents with higher environmental knowledge are more likely to engage in pro-environmental behaviour, compared with other respondents.

Methodology

The chapter is divided in to three sections: participants, procedure and measures.

Participants

A group of 280 subjects used for the multiple regression under study included Chanayetharzan, Chanmyatharzi, Aungmyaetharzan and Maharaungmaye in Mandalay. Subjects were 162 women and 118 man respondents ranging in above age from 18 years.

Procedure

Subjects were selected in a three stage stratified cluster sampling design with census blocks as primarily sampling units and households as secondary units. The original sample was stratified by socioeconomic status (lower, middle, and higher) complied by the ward office. The sample consisting of 2013 candidates resulted in 320 cases selected by choosing every third household with participants, a process that included some cluster stages. To contact potential informants, the researcher and research assistants, after arriving in a selected community, knocked on doors, communicating their intentions. Participants were told that they could refuse the questionnaire if they wished. Almost 12.5% of these respondents, mostly high socioeconomic status participants refused to complete the questionnaire once it was started. The final sample was comprised of 280 participants, with lower and middle-class households being overrepresented.

Measures

The questionnaire packet contained three measures: the Myanmar Version of the Pro-Environmental Behavior Scale and the Environmental Knowledge Scale.

Environmental Behavior. Environmental behaviour was measured with the Pro-Environmental Behaviour Scale developed by Xiao & Hong (2010). They formed three behavioral indices using ten survey items. Respondents are asked to indicate whether in the past year they had never, occasionally, or often taken ten different environmentally oriented actions (see Appendix). Judging by the face validity and results of a preliminary principle component analysis, they combined items 1,2,3,4 and 6 to create a private environmental behavior index (the “private index”) and then items 5,7,8,9 and 10 to from a public environmental behavior index (the “public index”). For conceptual and comparison purposes, they also created a combined environmental behavior index (the “combined index”) with all ten items. The alpha of this scale was .72.

Environmental Knowledge. Environmental Knowledge was measured with the Environmental Knowledge Scale developed by Hong and Xiao (2007a). Respondents were asked to indicate what extent they agree with 10 dichotomous items about environmental knowledge. The reliability was found to be .70 for the Environmental Knowledge Scale.

Demographic Variables. Two demographic variables (gender and age,) traditionally studied in association with pro-environmental behavior (Scott & Willits, 1994, Tarrant & Cordell 1997, Gong & Lei, (2007) were used in this study.

Results

This chapter describes the results of the data analyses and discussion that were conducted.

Table 1 Summary statistics of pro-environmental behavior, environmental knowledge and socio-demographic conditions of respondents

Variables	Description	Mean	SD
PK	Aggregation of responses to 8 questions	7.68	3.70
PB	Aggregation of responses to 10 EP questions	19.55	3.65
Gender	Female=1; Male=2	1.49	1.22
Age	Years	39.32	13.37
Recycle	Never=1, Occasionally=2, Often=3	2.00	0.67
Environmental talk	Never=1, Occasionally=2, Often=3	2.01	0.60
Bring bag	Never=1, Occasionally=2, Often=3	2.54	0.69
Recycling bags	Never=1, Occasionally=2, Often=3	2.16	0.84
Env-donation	Never=1, Occasionally=2, Often=3	1.75	0.67
Env-education	Never=1, Occasionally=2, Often=3	2.40	0.61
Env-campaigning	Never=1, Occasionally=2, Often=3	1.69	0.69
Env-volunteering	Never=1, Occasionally=2, Often=3	1.66	0.70
Env-maintaining	Never=1, Occasionally=2, Often=3	1.56	0.71
Env-litigation	Never=1, Occasionally=2, Often=3	1.78	0.69

SD= standard deviation , PK= environmental knowledge, PB= pro-environmental Behavior

Respondents of the survey had a mean environmental knowledge score of 7.68 and mean pro-environmental behavior score of 19.55 (Table 1). The sample was 58% female and mean age was 39.

Among respondents in the sample, more than half reported often engaging in recycling (55%), environmental talk (64%), bring their own shopping bag (65%) and environmental maintaining (57%), while less than half of them reported engaging in recycling bags (44%), environmental donation (50%), environmental education (47%), environmental campaigning (44%), environmental volunteering (47%) and environmental litigation (47%).

Differences between male and female respondents in pro-environmental behavior

As shown in Figure 1, female respondents were significantly more likely to engage in recycling bags ($t=3.01$, $p<.01$) and bringing bags ($t=2.42$, $p<.05$) than male respondents. However, female respondents were significantly less likely to engage in environmental volunteering ($t=-2.36$, $p<.05$) than male respondents. For the other variables, no significant differences were found between the two groups.

Differences between older and younger respondents in pro-environmental behavior

T-tests were employed to examine whether the pro-environmental behavior of older and younger differed significantly. Figure 2 shows that older respondents had a higher pro-environmental behavior than younger respondents. Older respondents were significantly more likely to engage in environmental maintaining ($t=-2.56$, $p<.05$), environmental volunteering ($t=-2.16$, $p<.05$) and environmental education ($t=-2.92$, $p<.01$) than younger respondents. However, older respondents were significantly less likely to engage in recycling bags than younger respondents ($t=2.34$, $p<.05$). For the other variables, no significant differences were found between the two groups.

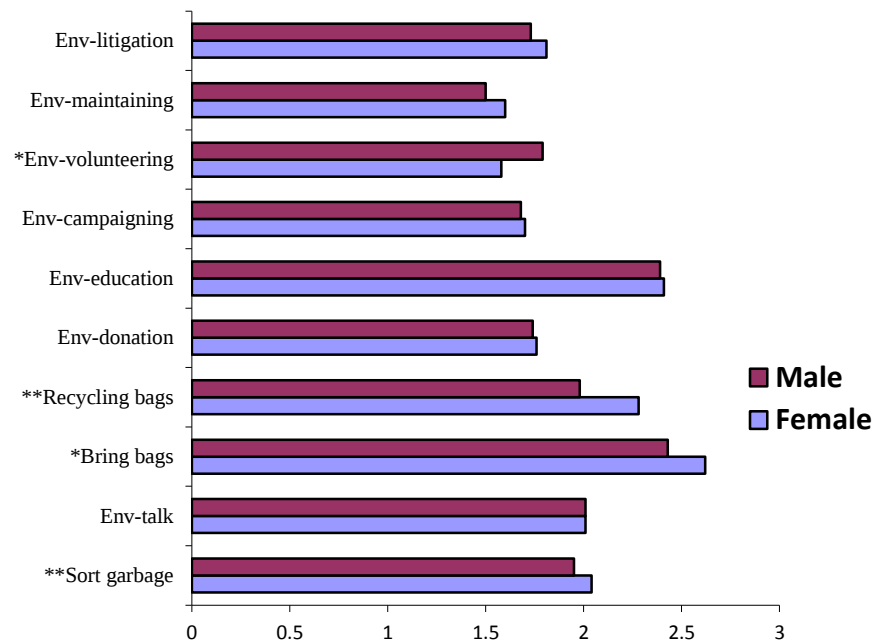


Figure 1: Differences between male and female respondents in pro-environmental behavior

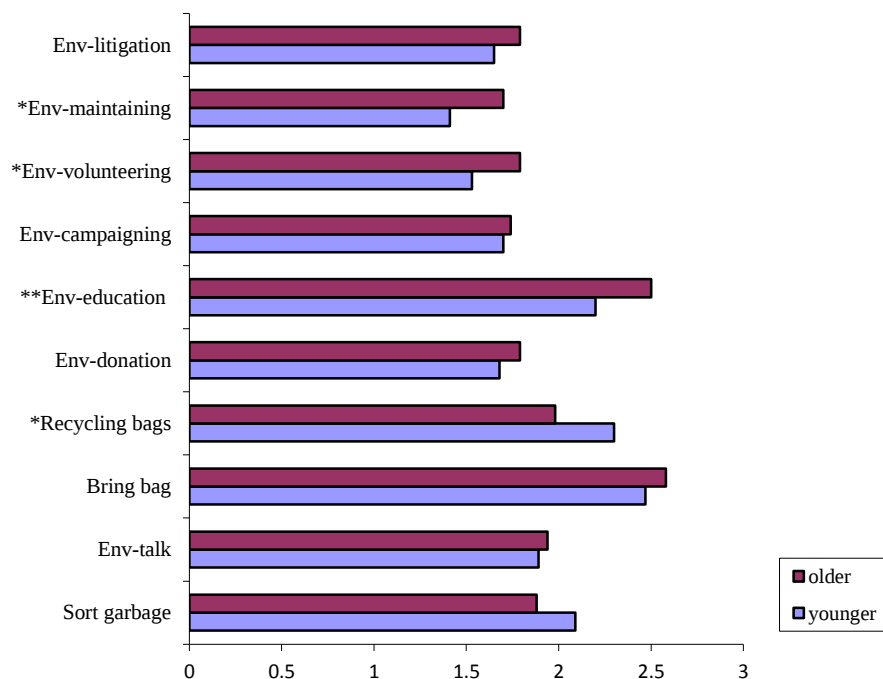


Figure 2: Differences between older and younger respondents in pro-environmental behavior

Different between higher level of environmental knowledge and pro-environmental behavior

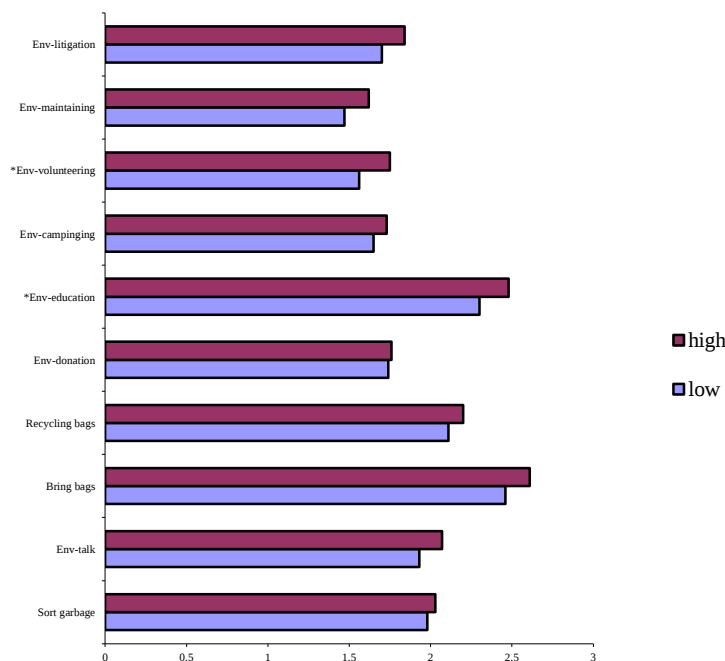


Figure 3: Differences between environmental knowledge and pro-environmental behavior

Figure 3 shows that respondents with higher levels of knowledge were significantly more likely to engage in Env-Education ($t=-2.52$, $p<.05$) and Env-volunteering ($t=-2.19$, $p<.05$) than lower levels of Knowledge. For the other variables, no significant differences were found between the two groups.

Correlation between environmental knowledge and pro-environmental behavior

Correlations among environmental knowledge and pro-environmental behavior are presented in Table 2. The results indicated that environmental knowledge was significantly positive correlated with pro-environmental behaviors.

Table 2 Correlation between Environmental Attitude and Pro-environmental Behavior

	Pro-environmental behavior	Environmental knowledge
Pro-environmental behavior		.29**
Environmental knowledge	.29**	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Discussion

Study results reveal that overall men and women participated equally in public environmental behaviors while women's participation in private environmental behaviors (environmental behaviors inside of the home) was even significantly higher than that of men. This finding is consistent with the literature on environmental behaviors in Western settings (Dunlap et al. 2000; Lopez et al. 2007). Women perform more private environmental behaviors as a part of their daily routines, much like recycling is being routinized in England (Oates and McDonald 2006). We thus suspect that the gender gap observed in private environmental behaviors in our study may be a reflection of the unequal division of domestic duties between women and men.

Furthermore, recall that in Tindall et al. (2003) theoretic models, women were expected to more often participate in environmental behaviors because they tended to express more environmental concern, which is true inside of the home in western settings according to recent research. On the other hand, it was argued that women's greater share of domestic duties may reduce their biographical availability for environmental behaviors outside the home and, therefore, regardless of levels of concern may result in roughly equal behavioral responses across men and women. In the case of these, our results are also similar. Specifically, we found, women to express higher levels of environmental concern. As a result, women's higher levels of participation in private environmental behaviors can be attributed to gender differences in environmental concern. Thus, our hypothesis 2 was partially supported.

The result indicates that there is significance relationship between age and pro-environmental behavior. Thus, providing support for hypothesis 1. Older people tend to take environmental responsible actions more frequently than younger people. This may be related to the fact that older people could have more information and could be more conscious of the importance of taking pro-environmental actions. Moreover, older people seem to be more worried about the environment than younger people. Older people are more likely to have children and they may try to preserve the environment in the long term because their children are the ones who will enjoy a cleaner environment in the future.

Interestingly, correlation analysis revealed that environmental knowledge had significant correlated with pro-environmental behavior. Thus, our hypothesis 3 was supported. Although theoretical knowledge seems to play a significant role in pro-environmental behaviour, the empirical evidence is not so clear (Kaiser and Fuhrer, 2003; Laroche *et al.*, 2001). Results suggest that in urban China, higher levels of environmental knowledge were clearly associated with higher levels of environmental concern.

Our study excluded some smaller cities and rural regions of Myanmar due to lack of data, thus these findings cannot be assumed to extend to these regions and a few provinces where the survey was not conducted. Although we identified potential mechanisms for explaining predictors of pro-environmental behavior in urban Myanmar, future studies should test those mechanisms.

Conclusion

The purpose of this study was to investigate the effects of environmental knowledge and socio-demographic factors on pro-environmental behavior in Mandalay, Myanmar. The results of this study tend to support the hypotheses that age, gender and environmental knowledge are positively correlated with the pro-environmental behavior.

Then, the effects of environmental knowledge and socio-demographic factors on pro-environmental behavior in Mandalay, Myanmar were investigated. Study results reveal that overall men and women participated equally in public environmental behaviors while women's participation in private environmental behaviors (environmental behaviors inside of the home) was even significantly higher than that of men. Specifically, we found, women to express higher levels of environmental concern. As a result, women's higher levels of participation in private environmental behaviors can be attributed to gender differences in environmental concern.

Furthermore, the result indicates that there is significance positive relationship between age and pro-environmental behavior. Older people tend to take environmental responsible actions more frequently than younger people.

Finally, correlation analysis revealed that environmental knowledge had significant association with pro-environmental behavior. The finding, however, has major implications in Myanmar where land erosion, flooding, drought and other natural disasters have boomed.

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