Scientific Research Publishing

The Effect of Overseas Educational Experience on Pro-Environmental Practices: Evidence from Cambodian Academic Scholars

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Abstract

This paper revealed that after spending years overseas for learning, Cambodian fellows realized that a clean society more likely results from the adopting of a waste management system. The lack of such is the main barrier for waste separation willingness and practices in Cambodia. Self-transcendence values and volunteerism are empirically found as the fundamental factors for any interventions designed to promote pro-environmental intentions and practices respectively. The fellows engaging in volunteerisms appear to do waste separation, ignoring how inconvenient the waste management system or facilities are. Similarly, the fellows concerning the environmental and social issues appear to spare their valuable time to do waste-separation which they find not difficult. This is not the case in this COVID-19 epidemic though. The study results imply that in a society where an inconvenient waste management system is in place the fellows without past volunteering, no matter how knowledgeable they are, will less likely engage in the waste-sorting practice.

Keywords

Pro-Environmental Practice, Self-Transcendence, Volunteerism, Instrumental Variable (IV)

1. Introduction

There has been increasing recognition that human activities have become so pervasive and profound in their consequences that they degrade the environment on a global scale [1]. As of 2015, approximately 6300 million tons of plastic waste had been generated by the continuing growth of the population [2], around

79% was accumulated in landfills or the natural environment. If not properly managed, the waste generated will be a serious health hazard and lead to the spread of infectious diseases [3]. Therefore, citizens as consumers need to be responsible for modifying their lifestyle for the sake of preserving global natural resources and of future generations through, activities that result in less or no harmful effects on humans and the environment.

Sound Materials-Cycles Society (SMC) known as the circular economy is an idea believed to reduce negative environmental impacts [4] and has been defined as an approach to sustainable development [5], a society where human beings shall be in harmony with nature [6]. Estimation of the movement of materials in an economic society is the concept underlying the SMC, particularly putting 3Rs (*i.e.*, reduction, reuse and recycle) into action. This target is impossible till human being is motivated to adopt pro-environment behavior [7] which is determined by the combination of socio-economic and psychological determinants [8].

Education is, on one hand, one of the motivating factors influencing human's attitude toward the environment [9] [10]. People who are knowledgeable in environment can make better decisions about what and how they consume and dispose [11] [12] as cited by [13] [14] [15] [16] [17]. Procedural knowledge on recycling is, for instance, obviously important and identified as a predictor for attitude towards source-separated collection [18] and as a determinant for recycling behavior [11] [19]. Accessibility to convenient recycling facilities is, on the other hand, indeed a situational factor that can convince people to separate waste at source [20]-[25] and it is more effective than information [26]. Combining these two, know-how and accessibility to recycling, affects the relationship between people's attitudes and their recycling motives [27] [28] [29] [30].

The regular practice of an act such as separating waste under stable conditions is more likely to habituate the behavior [31] [32], becoming less dependent on intention [33]. As new behavior can be activated as soon as the first quarter of the year [34], the daily practice of waste separation at source among fellows experiencing overseas education will, it can be assumed, habituate waste separation. After which it becomes very hard to change the habit unless there is a contextual change that disrupts habitual behavior [34] [35] [36]. So, does overseas education transfer the knowledge and practice about waste recycling? Or does the contextual change really disrupt the habitual behavior?

Past recycling behavior is one of the determinants of intention [37] [38] and behavior toward recycling as well that providing residents convenient location of waste separation and collection facilities will have habitual behavior formed through repeated waste management practices. In empirical studies, past recycling behavior is identified as one of significant predictors of continuation of the practice [39] [40]. Some studies found that experiences with recycling influences motives to recycle and could even facilitate knowledge and attitude change [27] [41] [42]. As cited by [43], this statement is supported by three meta-analytic

studies, citing that variance in intention is more explained upon the addition of past behavior into the model [44] [45]. So, does overseas education positively correlate with waste recycling intention? The intention is a predictor of behavior and is influenced by attitude, subjective norms, and perceived behavioral control [46].

Volunteering has been widely studied in developed countries and it has been found as the key determinant of pro-environmental practices and strongly affects waste management practices [47]. However, it seems there is a lack of studies of its relationship with pro-environmental practices in an inconvenient context, particularly in developing countries where waste recycling facilities are still conventional. Waste separation practice in an inconvenient context is a part of volunteering since it takes time and other resources (*i.e.*, opportunity cost). Whether a person will more likely be recognized as a volunteer or not relies on the amount of work done (*i.e.*, cost) [48]. Since past volunteering has a causal influence on current and future participation [49], does past volunteering more likely positively correlates with waste separation practice?

In addition to education and convenience, human values could drive a person's actions [50]. Human values and identity are factors crucial to motivating people to start recycling [51]. These two factors were found to influence pro-environmental attitudes and behavior [52] [53]. Although it's accepted that there is a value-action gap, it influences a broad range of behaviors [54]. A study suggested considering human values, altruism, and biosphere, as one of the factors in any programs designed to promote stable pro-environmental behavior [55]. *Dominicis* confirmed altruism has a relationship with pro-environmental behaviors [56] which is beyond the claims that values were just related to pro-environmental beliefs or attitudes [57] [58] [59] [60].

Some theories have been tested and confirmed the positive relationship between values and environmental behaviors. The Schwartz's Norm Activation Model (NAM) in 1977, originally developed for altruistic behavior –helping others [61], has been found to influence environment-oriented behaviors as well [62] [63] [64] [65]. Developed based on the altruism theory of Schwartz 1977 [66], Stern *et al.*'s Values Beliefs Norms (VBN) theory developed for pro-environmental behavior confirmed that an altruistic person is more likely to behave pro-environmentally [67]. *Self-transcendence* value, the combination between altruism and biosphere value [68] [69], makes individuals focus on the interests of others and the environment [50] [70] and is typically positively related to both pro-environmental beliefs and behaviors [69] [71] [72] [73] [74]. However, its relationship with waste-separation practice has unlikely been tested. So, whether *Self-Transcendence* value affects behavior toward waste separation is still a question.

This is a natural experimental study purposively designed to compare a group of people with educational background at local level (*i.e.*, developing country where waste recycling facilities are conventional) with another group of people who experiences overseas education (*i.e.*, developed countries where waste recy-

cling facilities are in place) as a plus to find out whether there is statistically significant difference between their pro-environmental practices, intentions, and knowledge. The study explores how resilient the practices and intentions will be upon graduation and their return home, where facilities and accessibility to recycling are not yet in place. The remainder of the paper is organized as follows. Section I describes materials and methods used for analysis. Section II illustrates the results and discussion and finally, Section III is the conclusions.

2. Material and Methods

The study was conducted online using Survey Monkey. Two groups, the testing group and a control group were interviewed. In cooperation with the Cambodian Association in Japan (CSAJ) and the Hiroshima Alumni Network (HAN), the online survey was administered using the mailing list of the Association and Telegram Apps of the network to target the alumni, a group of people who had been educated overseas (N = 164). Around 85% of respondents gained their educational experiences in Japan. The remaining 15% experienced overseas education in Thailand, New Zealand, Australia, South Korea, or the Netherlands.

To reach the group of people with only a local education in Cambodia (N = 59), the questionnaires were distributed via social media, Facebook. Within two weeks, starting from mid-November 2020, a total of 224 respondents agreed and participated in the survey.

2.1. Outcome Variables

The two outcomes to be tested include pro-environmental behaviors and the environmental knowledge affecting people's motivations towards waste separation. Waste separation is explored as being a requisite for any campaigns to promote solid waste management in Cambodia [75]. As an indicator of behavior, respondents were asked about the frequency with which they had engaged in two types of waste management practices: 1) waste separation and 2) waste reduction. This is a single-item measure: "*How often do you separate waste*?" and "*How often do you use your own reusable shopping bag*?" The frequency of their waste disposal practice is then divided into five categories: never, rarely, sometimes, often, and always.

For environmental knowledge, respondents were asked to rate the 5-point Likert scale on five items: 1) "*People in my family don't support waste separation*"; 2) "*I will not segregate unless the waste collection service requires me to do so*"; 3) "*My neighboring families never separate their waste*"; 4) "*Waste separation is difficult*" and 5) "*I don't have time to separate waste*". Participants responded on a 5-point scale (0 = strongly disagree to 4 = strongly agree).
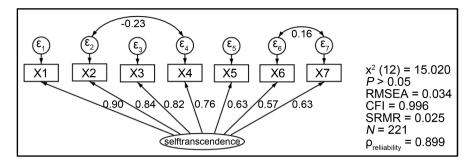
2.2. Control Variables

Participants reported their gender, age, and marital status; these three background variables were included in our subsequent analyses as control variables.

A binary indicator (1 = volunteerism, 0 = otherwise) was also added as the covariate since it strongly affects waste management practices [47]. Since the survey took place during the outbreak of COVID-19 by which human physical and mental health is affected [76], it is crucial to some extent to understand its relationship with daily practice of waste management. So, respondents were asked to rate the 5-point Likert scale on one-item measure for one's own concerns over COVID-19: "*How concerned are you about the possibility of becoming infected by* COVID-19". Participants responded on a 5-point scale (0 = not at all to 4 = extremely concern). Higher scores indicate people are concerned about the possibility of a COVID-19 infection.

For social and environmental concerns, respondents were asked to rank the 7-point Likert scale on nine-item measure (0 = extremely disagree to 6 = extremely agree). These items were adopted from a study conducted to measure human value in environment, *self-transcendence* [77] [78]. A row mean score of the construct was computed after the reliability and validity of the construct were measured. Higher scores indicate people are more likely altruistic and biospheric. Descriptive statistics of these outcomes and control variables can be found in SI Table B1.

To evaluate the construct reliability and validity, Alpha Reliability ($\propto$), the internal reliability (rho) [79], the convergent validity of the indicators as well as the composite reliability of the construct [80] were all tested. These tests are used to find out if all indicators belonging to the same construct are highly correlated with each other. The internal reliability (rho) was computed based on the result of Confirmatory Factor Analysis (CFA) analyzed with Stata 15.1.

The CFA results show the goodness of fit with the data set. All the factor loadings are substantial and statistically significant. If you are 1 standard deviation higher on *self-transcendence*, you will respond 0.90 standard deviations higher on X1 (*i.e., it is important to love nature more*), 0.57 standard deviations higher on X6 (*i.e., it is important to avoid war*) respectively (see SI Table B2). The model indices are listed as follows: Chi-square to degree of freedom $X^2(12)$ = 15.020 with $p > 0.05$ (>0.05), Comparative fit index (CFI) is 0.996 (≥0.95), Root Mean Square Error of Approximation (RMSEA) is 0.034 (≤0.05) and Standardized Root Mean Squared Residual (SRMR) is 0.025 (≤0.08). Like the Alpha reliability ($\propto$ = 0.890), this goodness of fit model resulted from dropping two items: X8: *It is important to have equal opportunities* and X9: *It is important to take care of those who are worse off* (see Figure 1).

As already computed, the Cronbach's alphas ($\propto$ = 0.890) exceed the criteria value of 0.7, indicating a high degree of internal consistency. The composite reliability (CR) = 0.895 (>0.70), shows reliability of the construct. The average variance extracted (AVE) = 0.556 (>0.50) demonstrates the construct was established with satisfactory convergent validity. The internal reliability (rho) (p = 0.899) indicates that the variation in the scale is 89.9% explained by the construct (see SI Table B3).

Figure 1. Result of Confirmatory Factor Analysis (CFA). Note: X1: It is important to love nature more; X2: It is important to stop environmental pollution; X3: It is important to protect and preserve environment; X4: It is important we shall live with nature; X5: It is important to help each other; X6: It is important to avoid war and X7: It is important to have equal justice.

2.3. Balance Test

The test assumed that the respondents assigned to either the control or testing group differed only in their access to education. To show that the statement is true, a balance test was conducted on six covariates, including age, gender, spouse, COVID-19 concerns, volunteerism, and self-transcendence. The test used *t-tests* as a means for comparison to check if there is statistically significant difference between the two groups. As a result, the null hypothesis that the true difference in means of each covariate is equal to 0 is not rejected (Table 1). So, the above-mentioned assumption holds.

2.4. Econometrics Analysis

To generate causal estimates of the effects of overseas educational experiences on waste separation behavior, I employed an econometrics analysis, the Instrumental Variable (IV) design. The intent is to test if there is statistically significant difference between the testing group (the group experiencing overseas education) and the control group (the group experiencing only local education), in terms of their behaviors and knowledge towards waste separation. So, the testing group is a binary variable (1 = overseas educational experience, 0 = otherwise). Though this is not the case for the control group, each group is also endogenous to general education. So, I instrumented the testing group (endogenous regressor) by education level (instrument).

I estimated a two-stage least squares (2SLS) strategy with the following equation:

First-stage regression:

$$Testing_{ij} = k + \gamma EL_i + \theta_{ic} + \omega X_{ij} + \int_{ij} \tag{1}$$

where *Testing* is a binary indicator of the individual *i* experiencing overseas education *j*. *Education Level* (*EL*) denotes the level of general education that individual *i* has attained so far. Since social behavior and barriers to recycling can differ tremendously between areas [81], I controlled country-level fixed effects (*θ*) that individual *i* is living in a country *c*. *X* is a vector of covariates of individual

Table 1. Balance test between control and testing group.

Covariate	Control Group (Mean)	Testing Group (Mean)	Group Comparison (p-value)
Age	30.385	31.213	$p = 0.402$
Gender	0.517	0.625	$p = 0.149$
Spouse	0.534	0.422	$p = 0.142$
COVID-19	2.474	2.343	$p = 0.373$
Volunteerism	0.701	0.664	$p = 0.608$
Self-transcendence	5.343	5.253	$p = 0.340$

i experiencing overseas education j.

Second-stage estimation:

$$Y_{ij} = \propto + \beta Testing_{ij} + \phi_{ic} + \varphi X_{ij} + \varepsilon_{ij} \tag{2}$$

3. Results and Discussion

Table 2 below presents the results of the Ordinary Least Square (OLS) regression, the first and second-stage regression of the Instrumental Variable (IV) model. An instrumental variable must not be correlated with the equation's disturbance ϵ, and it must be highly correlated with the included endogenous regressor. As recommended by [82], the partial R^2 and F-statistic of the identifying instruments first-stage regression are useful indicators of the quality of the IV estimates and should be reported. It shows the strength of instrument. According to [83] [84], an F-statistic less than 10 is cause for concern or means that our instrument is weak. After being tested, the resulting F-statistic of each model is higher than 10 with $p < 0.01$, meaning that the instrument is not weak.

As a result, overseas educational experience obviously gave Cambodian fellows not only academic experience, but also consciousness of the need for waste recycling and practical ability. Waste separation as a practice which was found statistically significant at 5% level ($\beta = 1.060$, $p < 0.05$) is not surprising (regression 3; Table 2) considering Japan rules, for instance, that waste separation at source is compulsory. However, the practice sharply decreased and become statistically insignificant ($\beta = 0.378$, $p > 0.05$) upon controlling fixed effects (regression 4; Table 2). So, the variation in waste separation practice is more likely explained by situational factor, the access to an effective waste management system particularly.

This result reflects the significant role of waste management system in managing solid waste of either country. In Cambodia, waste separation is neither mandatory at source, nor practical at waste management system. Therefore, people, no matter how knowledgeable they are, will be less likely to practice waste separation while facing inconvenient circumstances. Though waste separation practice of those Cambodian fellows becomes habituated [31] [32] [37] [38] [85] [86] while being in Japan, it will become gradually extinguished when encountering a new context where previous behavior becomes shaped differently

Table 2. Effect of overseas educational experience on waste-separation practice.

	OLS	OLS	2SLS		2SLS	
			1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	0.789***	0.147	-	1.060**	-	0.378
	(0.183)	(0.194)	-	(0.449)	-	(0.414)
General education	-	-	0.247***	-	0.207***	-
	-	-	(0.062)	-	(0.055)	-
Constant	2.700***	3.590***	0.239	2.589***	0.409	3.458***
	(0.780)	(0.648)	(0.302)	(0.754)	(0.271)	(0.604)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects?	No	Yes	No	No	Yes	Yes
Observations	203	203	203	203	203	203
R-squared (R^2)	0.149	0.403	-	-	-	-
F-statistic	-	-	15.74	-	14.27	-

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

[34] [35] [36] [87].

This finding is consistent with previous studies, citing that knowledge alone doesn't convince people to practice waste recycling [27] [28] [29] [30] [41], until it is combined with accessibility to recycling or convenience [20]-[26] [88]. Waste separation behavior is obviously determined by waste management facilities and social context [89]-[94]. Therefore, the fellows are neither to adhere to responsible waste separation upon their return home since they had realized that formalized and widespread waste collection system in their municipality has not evolved.

Similarly, overseas educational experience could not even facilitate environmental knowledge change which is unexpected and different from previous studies [27] [41] [42]. No statistically significant difference was detected between the testing group and control group in terms of the five items used to assess the knowledge change. The fellows all had similar understanding on waste problems. They appeared to disagree with the statements that waste separation is difficult ($\beta = -0.243$, $p > 0.05$), waste separation is impossible until there is an active participation from their neighbors ($\beta = -0.905$, $p > 0.05$) and waste separation is impossible until there is support from their family members ($\beta = -0.532$, $p > 0.05$). However, the fellows experiencing oversea education seemed to have stronger commitment on time allocated for waste separation ($\beta = -0.773$, $p < 0.10$), particularly as soon as an improved waste collection system is installed. The fellows realize that a clean society is more likely achieved with an improved

waste management system ($\beta = 0.639$, $p > 0.05$). The indicator: "*Is improved waste collection system necessary*?" is positive though it is statistically insignificant (regression 3; Table 3).

Those fellows who felt concern with COVID-19 infection seemed to find waste-separation difficult and complicated ($\beta = 0.165$, $p < 0.10$) and they appeared to allocate their time for taking care of their health rather than waste separation ($\beta = 0.236$, $p < 0.01$). It is a logic that when both our physical and mental health are severely affected by COVID-19, our daily routine including waste management practice will also be affected [77]. It should be the municipality to take overall responsibilities for municipal solid waste management, particularly in this pandemic, they insisted ($\beta = 0.175$, $p < 0.10$) (regression 4; SI Tables B4-B6).

On contrary, people with *self-transcendence* values expressed their opinion in an opposite way. They appeared to be able to allocate their time to do waste-separation ($\beta = -0.422$, $p < 0.01$) which they found not difficult ($\beta = -0.388$, $p < 0.01$). They seemed to be ready to spend their time sorting their garbage for a better environment (regression 4; SI Tables B4-B6). This result is parallel with the previous result, citing that people would spend time on pro-environmental activities if they realized the environmental problems and they could mitigate them [95]. For those fellows who got married, they disagreed waste sorting needs involvement of the neighbors ($\beta = -0.423$, $p < 0.10$) (regression 4; SI Table B7), while those fellows experiencing clean-up activities (*i.e.*, volunteering) disagreed waste sorting needs the involvement of family members ($\beta = -0.284$, $p < 0.10$)(regression 4; SI Table B8).

Table 3. Effect of overseas educational experience on knowledge change.

	Is waste separation difficult?	Don't you have time for waste separation?	Is improved waste collection system necessary?	Does waste sorting need involvement of our neighbors?	Does waste sorting need involvement of family members?
	[1]	[2]	[3]	[4]	[5]
Testing group	−0.243	−0.773*	0.639	−0.905	−0.532
	(0.583)	(0.458)	(0.574)	(0.625)	(0.473)
Constant	5.252***	4.969***	4.856***	3.556***	4.390***
	(0.799)	(0.574)	(0.976)	(0.740)	(0.717)
Controls	Yes	Yes	Yes	Yes	Yes
Country fixed effects?	Yes	Yes	Yes	Yes	Yes
Observations	206	206	205	205	205
F-statistic	15.40	15.40	16.22	15.17	15.56

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

By the way, *volunteerism* (*i.e.*, past volunteering in clean-up activities) is the only variable found statistically significant ($\beta = 0.497$, $p < 0.05$) in explaining the variation in waste separation practice which is consistent with the previous study of [47]. Noticeably, its interaction effect with the coefficient of overseas educational experience makes the model statistically significant at 5% level with F-statistic = 156.42. The insignificance of overidentification test X^2(1, $N = 203$) = 0.077; $p = 0.781$ confirms the validity of the model (regression 5, SI Table B9). Thus, this finding implies that people experiencing overseas education and voluntarily engaging in clean-up activities more likely practice waste separation for environment's sake no matter how inconvenient the waste management system or facilities is. So, social factors are unlikely the barrier concerning waste-separation practice which is beyond the facts claimed by previous studies.

Nevertheless, *Self-transcendence* values (*i.e.*, biosphere plus altruism) were unlikely the determinant of waste separation practice, even though it has been regarded as the foundation for any interventions to promote waste separation behavior [51] [52]. Its interaction effect was not significant ($\beta = 0.088$, $p > 0.05$) with small F-statistic = 10.65 (regression 6; SI Table B9). This is likely from the fact that a variety of behaviors are not always explained by human values [54] and a predictor of one behavior is unlikely the predictor of the others [21]. Values appeared to affect behaviors more influenced by personality traits. For instance, a study found that values or identity was one of determinants of plastic consumption behavior [96] and another study found that altruistic people more likely, for the sake of environment and its enjoyment, engaged in beach clean-up activities [56].

Though gender did play a crucial role in predicting pro-environmental intentions (SI Table B10 & Table B11) [88] [97] [98] [99] [100], this study didn't find its effect on waste-sorting practice, but shopping-bag usage ($\beta = -0.507$, $p < 0.01$) (regression 4; SI Table B12). From the correlation matrix (SI Table B13), female respondents are more concerned with environmental and social issues ($r = -0.23$, $p < 0.05$) [101] [102] [103] and whereby more engage in environmental and social affairs voluntarily ($r = -0.18$, $p < 0.01$). So, any interventions designed to promote pro-environmental behaviors more likely be met with more success if oriented to participants regardless of gender. Different from [41], this study did not find any spousal influence on both waste-separation and shopping-bag usage.

The findings of this study obviously provide insights on how the eco-innovations, a way of creating a successful circular economy [104] as cited by [105], are performed particularly in developing countries where waste management system and recycling facilities are under development. Waste-sorting practices among consumers, known as a type of 3Rs (*i.e.*, reduction, reuse and recycle), is the environmentally responsible behavior required for the success of circular economy [106] [107] [108] [109] which is seen as a component towards achieving the UN Sustainable Development Goals (SDG), *i.e.*, SDG 12: Responsible Consumption

and Production [110].

Among the three determinants of eco-innovations (*i.e.*, policy and regulation, supply side and demand side determinant), this study suggested to act immediately and as a priority regarding the policy and supply side determinant. The Best Environmental Practices (BEP) provided in the Stockholm Convention National Implementation Plan (NIP) which is being implemented by developing countries [112] will be more effective if attitudinal factors (*i.e.*, volunteering, and *self-transcendence* values) which is also found in Europe as an inevitable one [113], are considered. Community-based Waste Management approach, an alternative to convince more and more engagement from the public in waste management [114], shall be promoted in the policy as well. It has been found as a solution to raise public awareness as well as to mobilize people to voluntarily participate and ensure the cleanliness in a community (*i.e.*, to monitor and prevent waste disposal).

Nevertheless, at supply side, waste management system and recycling facilities at municipality level shall be upgraded as well. The better the waste management system is, the more convenient people will feel, whereby more public participation in waste management is expected [20]-[25]. For demand side (*i.e.*, consumer needs), in addition to theoretical knowledge and know-how, increasing people interest in the value of nature is important. This study suggested to design a comprehensive environmental education program (*i.e.*, theories, practices, and technology) in educational institutes, especially among children [9] [10] [114].

Robustness Check

Since the waste-separation practice is insignificant, the waste-separation intention among the fellows might be statistically insignificant too, according to the theory of planned behavior [46]. In developing country like Cambodia where waste collection facilities are still conventional and not yet upgraded, waste-separation will be feasible for only two purposes –for compost or for sale. Respondents of either group (*i.e.*, testing group and control group) are unlikely to have intention to separate their garbage for compost or even for sale. Respondents were then asked to rate the 5-point Likert scale on three items for 1): "*I plan to separate my garbage into organic and non-organic*", 2): "*I will sell my garbage separated*" and 3): "*I will compost my garbage separated*". Participants responded on a 5-point scale (0 = most unlikely to 4 = most likely).

From **Table 4** below, as expected the three coefficients are all negative and statistically insignificant, except the item, "*I plan to compost my garbage sorted*". Therefore, we can assume that overseas education does not increase further the variation in the waste-separation intention among the respondents which is inconsistent with previous studies that showed a significant relationship between intention and past behavior [44] [45] [115] [116] as cited by [43]. See SI **Table B14** for full regression. Anyhow, overseas education appeared to make the fellows find waste-sorting for compost impossible ($\beta = -1.291$, $p < 0.05$).

Table 4. Effect of overseas educational experience on waste-sorting intentions.

	2SLS		2SLS		2SLS	
	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]		[2]		[3]	
Testing group	-	−0.122	-	−0.441	-	−1.291**
	-	(0.312)	-	(0.434)	-	(0.544)
General education	0.215***	-	0.214***	-	0.214***	-
	(0.054)	-	(0.054)	-	(0.055)	-
Constant	0.408	2.232***	0.408	3.017***	0.410	1.457*
	(0.271)	(0.645)	(0.271)	(0.597)	(0.270)	(0.804)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	205	205	205	205	206	206
F-statistic	15.59	-	15.59	-	15.40	-

Note: [1]: I plan to sort my garbage into organic and non-organic; [2]: I plan to sell my garbage sorted; [3]: I plan to compost my garbage sorted. Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

The shopping-bag usage behavior, where it is more influenced by personality traits than social factors; was tested and found statistically significant at 10% level ($\beta = 0.834$, $p < 0.10$) (regression 4; full results are in SI Table B12). Experiencing overseas education contributes to increasing the probability of using shopping bag (SI Table B15). Thus, the variation in shopping-bag usage behavior was indeed unexplained by situational factor. The fellows that had used shopping bag were not influenced by the new context and they seemed to keep practicing this behavior regardless of the places they reside in.

This could result from the existing capacity among the fellows, as claimed previously that people who have environmental knowledge can make more informed decisions on how and what to consume and dispose [11] [12] as cited by [13] [14] [15] [28] [30] [117] [118]. In this sense, the capacity related to waste management or disposal of either group (i.e., testing group and control group) appears to be not significantly different.

4. Conclusions

The overseas educational experience is partially linked to knowledge change among Cambodian graduates. Understanding that a clean society basically rests on the waste management system governed by the municipality, the willingness to separate waste became less likely upon their arrival at their home country, Cambodia, where solid waste management systems are not convenient or functionally unreliable. Thereby, waste separation practice was not detected as well

which could result from the absence of waste collection stations, and waste collection schedule or convenient waste separation is a disincentive to maintain enthusiasm, etc.

However, past volunteering in clean-up activities was found as the only predictor significantly associated with waste-separation practice and its interaction effect with the coefficient of overseas education contributes to increasing the probability of sorting garbage even in an inconvenient context. Conversely, human concerns about the environment and social welfare (*i.e.*, self-transcendence) were seen as fundamental to promoting intentions rather than the practice toward waste separation. This finding proves that there is indeed a value-action gap, particularly for social influence-based practices (*i.e.*, waste-sorting). This finding suggested promoting volunteering among children and teenagers which could be made via its application in the NIP, the community-based waste management approach, the Early Childhood Learning Program within the national educational system as recommended by [9] [10] or the experiential learning program [119].

This study was conducted targeting only those Cambodians with higher education. With an average age of 30 years old and standard deviation of 6 years, the respondents of this study were in the minority at the educational institutions. This group represents merely 6.7% of those persons aged 25 and above who have attained post-secondary education [120]. So, these study results cannot be generalized to Cambodian people. People at the household level should be targeted as respondents of future research to provide a wider platform of information for policy and facility development. Looking at a different field of volunteering (*i.e.*, volunteering in social welfares) is another possibility to see its effect on pro-environmental practices.

There is doubt regarding the effect of "*self-transcendence*" on waste sorting practice. Since [55] and [56] confirmed altruism has a relationship with pro-environmental behaviors, the combined altruism and biosphere into one-dimension, *self-transcendence,* should expectedly increase its strength and sensitivity. If so, its effect on pro-environment behaviors is stronger and can be statistically detected more easily. However, it was not the case in this study. So, whether this one-factor or two-factor construct is better at predicting pro-environmental behaviors should be further explored.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Acknowledgements

tion. This study would have not been possible without the two organizations. Finally, special gratefulness is sent to the Samdhana Institute (SI) for sponsoring the publication of this article.

Disclaimers

The views expressed in this paper are those of the authors and do not reflect the official policy or position of the Samdhana Institutue (SI).

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper

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Supplemental Information

"The Effect of Overseas Educational Experience on Pro-Environmental Practices: Evidence from Cambodian Academic Scholars".

1) How to dispose of Household Garbage

In Japan, depending on the city, town, or district, there may be designated bags that residents are required to use for trash. In other words, the rules for separating and disposing of garbage depend on the local municipality. Many municipal offices provide pamphlets (Figure A1) that explain the rules of garbage disposal. Waste sorting at household level is strict.

Figure A1. Guideline for household garbage disposal in Higashi-Hiroshima city, Japan.

2) Supplementary Tables

Table B1. Descriptive statistics of the variables assigned as outcomes and controls.

Variables		Mean or share	SD	Min	Max
How often you separate waste		2.64	1.25	0	4
How often you bring ones' own shopping bag		2.63	0.98	0	4
I find waste separation difficult		2.74	1.11	0	4
I do not have time to separate waste		2.23	0.87	0	4
Waste is never separated by my neighboring families		3.42	1.08	0	4
Waste separation is not required by collection service		3.29	1.40	0	4
Waste separation is not encouraged by family members		3.13	1.02	0	4
Self-transcendence values ($p = 0.899$)		5.27	0.62	3.28	6
X1: It is important to love nature more		5.32	0.78	2	6
X2: It is important to stop environmental pollution		5.40	0.76	3	6
X3: It is important to protect and preserve environment		5.48	0.67	4	6
X4: It is important we shall live with nature		5.20	0.81	2	6
X5: It is important to help each other		4.88	0.83	2	6
X6: It is important to avoid war		5.35	0.83	3	6
X7: It is important to have equal justice		5.30	0.87	3	6
Age	Years old	30.97	6.37	18	52
Male	Dummy (1 = male)	0.59	0.49	0	1
Spouse	Dummy (1 = married)	0.45	0.49	0	1
Volunteerism	Dummy (1 = yes)	0.67	0.46	0	1
COVID-19 concern	1 = a little concerned (19.73%), 2 = fairly concerned (37.67%), 3 = very concerned (27.80%) and 4 = extremely concerned (14.80%)	2.37	0.96	1	4

Table B2. Final results for single-factor CFA model.

Loadings	Unstandardized Value	Standardized Value
X1: It is important to love nature more	1.00 (fixed)	0.90***
X2: It is important to stop environmental pollution	0.92***	0.84***
X3: It is important to protect and preserve environment	0.78***	0.82***
X4: It is important we shall live with nature	0.89***	0.76***
X5: It is important to help each other	0.75***	0.63***
X6: It is important to avoid war	0.68***	0.57***
X7: It is important to have equal justice	0.80***	0.63***
Variances		
error. X1	0.12	0.20
error. X2	0.17	0.29
error. X3	0.15	0.33
error. X4	0.27	0.41
error. X5	0.42	0.60
error. X6	0.47	0.67
error. X7	0.46	0.60
Self-transcendence	0.49	1.00 (fixed)
Covariance		
error. X2 with error. X4	−0.05**	−0.23*
error. X6 with error. X7	0.07*	0.16*

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

Table B3. Construct reliability and validity.

Construct	Indicators	Factor loading	Cronbach's Alpha	AVE	CR	p (Rho)
Self-transcendence	X1: It is important to love nature more	0.90***	0.890	0.556	0.895	0.899
	X2: It is important to stop environmental pollution	0.84***	-	-	-	-
	X3: It is important to protect and preserve environment	0.82***	-	-	-	-
	X4: It is important we shall live with nature	0.76***	-	-	-	-
	X5: It is important to help each other	0.63***	-	-	-	-
	X6: It is important to avoid war	0.57***	-	-	-	-
	X7: It is important to have equal justice	0.63***	-	-	-	-

Note: ***$p < 0.001$. AVE: average variance extracted; CR: composite reliability.

Table B4. Effect of overseas educational experience on know-how toward waste separation.

	OLS	OLS	2SLS		2SLS	
			1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	−0.223	−0.189	-	−0.263	-	−0.243
	(0.175)	(0.193)	-	(0.486)	-	(0.583)
Male	−0.257	−0.249	0.041	−0.264	0.001	−0.260
	(0.165)	(0.164)	(0.063)	(0.161)	(0.060)	(0.160)
Age	−0.011	−0.012	0.002	−0.011	0.009	−0.012
	(0.016)	(0.017)	(0.008)	(0.017)	(0.008)	(0.019)
Spouse	−0.306	−0.305	−0.184**	−0.288	−0.159**	−0.288
	(0.204)	(0.203)	(0.075)	(0.212)	(0.074)	(0.212)
Volunteerism	−0.137	−0.136	−0.037	−0.115	−0.035	−0.114
	(0.166)	(0.170)	(0.062)	(0.166)	(0.058)	(0.166)
COVID-19	0.157*	0.156*	−0.013	0.167*	0.001	0.165*
	(0.083)	(0.091)	(0.033)	(0.088)	(0.030)	(0.089)
Self-transcendence	−0.379***	−0.377***	−0.028	−0.390***	−0.037	−0.388***
	(0.126)	(0.118)	(0.047)	(0.114)	(0.043)	(0.114)
General education	-	-	0.253***	-	0.214***	-
	-	-	(0.062)	-	(0.055)	-
Constant	5.220***	5.174***	0.556**	5.279***	0.410	5.252***
	(0.759)	(0.765)	(0.216)	(0.759)	(0.270)	(0.799)
Country fixed effects?	No	Yes	No	No	Yes	Yes
Observation (N)	207	207	206	206	206	206
R-squared (R^2)	0.095	0.096	-	-	-	-
F-statistic	-	-	-	16.76	-	15.40

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B5. Effect of overseas educational experience on time allocated for waste-separation.

	OLS	OLS	2SLS		2SLS	
			1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	−0.392***	−0.434***	-	−0.666*	-	−0.773*
	(0.148)	(0.160)	-	(0.388)	-	(0.458)
Male	−0.094	−0.104	0.041	−0.080	0.001	−0.103
	(0.128)	(0.125)	(0.063)	(0.130)	(−0.060)	(0.124)
Age	−0.011	−0.008	0.002	−0.006	0.009	−0.001
	(0.014)	(0.014)	(0.008)	(0.014)	(0.008)	(0.016)
Spouse	−0.212	−0.213	−0.184**	−0.265	−0.159**	−0.267
	(0.160)	(0.162)	(0.075)	(0.173)	(0.074)	(0.176)
Volunteerism	−0.153	−0.154	−0.038	−0.158	−0.035	−0.159
	(0.126)	(0.126)	(0.062)	(0.123)	(0.058)	(0.124)
COVID-19	0.231***	0.235***	−0.013	0.227***	0.001	0.236***
	(0.071)	(0.072)	(0.033)	(0.072)	(0.030)	(0.071)
Self-transcendence	−0.409***	−0.413***	−0.028	−0.413***	−0.037	−0.422***
	(0.083)	(0.083)	(0.047)	(0.083)	(0.043)	(0.084)
General education	-	-	0.253***	-	0.214***	-
	-	-	(0.062)	-	(0.055)	-
Constant	4.707***	4.765***	0.244**	4.828***	0.410	4.969***
	(0.551)	(0.550)	(0.301)	(0.549)	(0.270)	(0.574)
Country fixed effects?	No	Yes	No	No	Yes	Yes
Observation (N)	207	207	206	206	206	206
R-squared (R^2)	0.175	0.177	-	-	-	-
F-statistic	-	-	-	16.76	-	15.40

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B6. Effect of overseas educational experience on improved waste collection system.

	OLS	OLS	2SLS		2SLS	
			1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	0.738***	0.553**	-	0.826*	-	0.639
	(0.218)	(0.248)	-	(0.491)	-	(0.574)
Male	−0.127	−0.171	0.047	−0.137	0.007	−0.178
	(0.202)	(0.198)	(0.063)	(0.201)	(0.059)	(0.194)
Age	−2.15e−06	0.009	0.001	0.002	0.008	0.007
	(0.019)	(0.019)	(0.008)	(0.019)	(0.008)	(0.022)
Spouse	−0.351	−0.355	−0.170**	−0.322	−0.147**	−0.326
	(0.252)	(0.252)	(0.076)	(0.254)	(0.074)	(0.254)
Volunteerism	−0.049	−0.055	−0.026	−0.038	−0.024	−0.041
	(0.216)	(0.218)	(0.061)	(0.214)	(0.058)	(0.215)
COVID-19	0.154	0.168	−0.023	0.161	−0.008	0.175*
	(0.103)	(0.102)	(0.033)	(0.102)	(0.030)	(0.101)
Self-transcendence	−0.376**	−0.392***	−0.027	−0.380***	−0.036	−0.396***
	(0.144)	(0.144)	(0.047)	(0.142)	(0.043)	(0.143)
General education	-	-	0.266***	-	-	-
	-	-	(0.063)	-	-	-
Constant	4.629***	4.879***	0.231	4.608***	0.395	4.856***
	(0.920)	(0.943)	(0.300)	(0.926)	(0.270)	(0.976)
Country fixed effects?	No	Yes	No	No	Yes	Yes
Observation (N)	206	206	205	205	205	205
R-squared (R^2)	0.096	0.113	-	-	-	-
F-statistic	-	-	-	17.67	-	16.22

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B7. Effect of overseas educational experience on improved waste collection system.

	OLS	OLS	2SLS 1st Stage	2SLS 2nd Stage	2SLS 1st Stage	2SLS 2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	0.063	0.132	-	−0.804	-	−0.905
	(0.173)	(0.192)	-	(0.524)	-	(0.625)
Male	0.223	0.240	0.049	0.280	0.008	0.258
	(0.163)	(0.167)	(0.063)	(0.181)	(0.059)	(0.181)
Age	0.025	0.022	0.001	0.039**	0.008	0.043*
	(0.016)	(0.017)	(0.008)	(0.019)	(0.008)	(0.022)
Spouse	−0.246	−0.244	−0.173**	−0.421**	−0.149**	−0.423*
	(0.198)	(0.197)	(0.076)	(0.211)	(0.075)	(0.217)
Volunteerism	−0.122	−0.120	−0.031	−0.147	−0.029	−0.149
	(0.161)	(0.161)	(0.062)	(0.171)	(0.058)	(0.172)
COVID-19	0.073	0.067	−0.016	0.052	−0.002	0.060
	(0.081)	(0.082)	(0.033)	(0.084)	(0.030)	(0.083)
Self-transcendence	−0.116	−0.110	−0.020	−0.114	−0.030	−0.123
	(0.108)	(0.109)	(0.047)	(0.111)	(0.043)	(0.112)
General education	-	-	0.253***	-		-
	-	-	(0.062)	-		
Constant	3.100***	3.006***	0.207	3.423***	0.377	3.556***
	(0.697)	(0.707)	(0.300)	(0.706)	(0.270)	(0.740)
Country fixed effects?	No	Yes	No	No	Yes	Yes
Observation (N)	206	206	205	205	205	205
R-squared (R^2)	0.047	0.054	-	-	-	-
F-statistic	-	-	-	16.53	-	15.17

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B8. Effect of overseas education on family members involvement in waste separation.

	OLS	OLS	2SLS 1st Stage	2SLS 2nd Stage	2SLS 1st Stage	2SLS 2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	−0.256	−0.381**	-	−0.356	-	−0.532
	(0.161)	(0.182)	-	(0.396)	-	(0.473)
Male	0.049	0.021	0.027	0.055	−0.008	0.022
	(0.158)	(0.159)	(0.062)	(0.156)	(0.060)	(0.156)
Age	0.001	0.007	0.002	0.002	0.009	0.010
	(0.016)	(0.018)	(0.008)	(0.017)	(0.008)	(0.020)
Spouse	−0.158	−0.161	−0.182**	−0.183	−0.158**	−0.189
	(0.206)	(0.210)	(0.075)	(0.214)	(0.074)	(0.218)
Volunteerism	−0.274*	−0.278*	−0.041	−0.281*	−0.037	−0.284*
	(0.164)	(0.163)	(0.062)	(0.162)	(0.058)	(0.162)
COVID-19	0.014	0.025	−0.021	0.010	−0.005	0.024
	(0.082)	(0.081)	(0.033)	(0.082)	(0.031)	(0.079)
Self-transcendence	−0.126	−0.136	−0.032	−0.125	−0.040	−0.139
	(0.115)	(0.116)	(0.046)	(0.113)	(0.042)	(0.113)
General education	-	-	0.267***	-	0.224***	-
	-	-	(0.063)	-	−(0.057)	-
Constant	4.134***	4.306***	0.241**	4.170***	0.404	4.390***
	(0.730)	(0.723)	(0.302)	(0.714)	(0.271)	(0.717)
Country fixed effects?	No	Yes	No	No	Yes	Yes
Observation (N)	206	206	205	205	205	205
R-squared (R^2)	0.037	0.052	-	-	-	-
F-statistic	-	-	-	17.59	-	15.56

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B9. Effect of overseas educational experience on waste-separation practice.

	OLS	OLS	2SLS		2SLS		2SLS	2SLS
			1st Stage	2nd Stage	1st Stage	2nd Stage	Interaction	Interaction
	[1]	[2]	[3]		[4]		[5]	[6]
Testing group	0.789***	0.147	-	1.060**	-	0.378	0.497**	0.088
	(0.183)	(0.194)	-	(0.449)	-	(0.414)	(0.203)	(0.070)
Male	0.051	−0.092	0.041	0.037	0.003	−0.093	−0.091	−0.105
	(0.182)	(0.146)	(0.064)	(0.180)	(0.061)	(0.143)	(0.144)	(0.144)
Age	−0.047**	−0.016	0.002	−0.051***	0.009	−0.021	−0.020	−0.023
	(0.018)	(0.017)	(0.008)	(0.019)	(0.008)	(0.020)	(0.016)	(0.020)
Spouse	0.193	0.210	−0.176**	0.245	−0.147*	0.245	0.259	0.261
	(0.225)	(0.192)	(0.076)	(0.231)	(0.075)	(0.196)	0.194	(0.198)
Volunteerism	0.348*	0.345**	−0.033	0.353*	−0.028	0.349**	-	0.364**
	(0.206)	(0.168)	(0.063)	(0.204)	(0.059)	(0.167)	-	(0.164)
COVID-19	−0.146	−0.091	−0.011	−0.143	0.003	−0.092	−0.107	−0.088
	(0.090)	(0.079)	(0.034)	(0.089)	(0.030)	(0.077)	(0.077)	(0.075)
Self-transcendence	0.155	0.096	−0.026	0.158	−0.036	0.102	0.097	-
	(0.128)	(0.106)	(0.047)	(0.126)	(0.043)	(0.104)	(0.103)	-
General education	-	-	0.247***	-	0.207***	-	-	-
	-	-	(0.062)	-	(0.055)	-	-	-
Constant	2.700***	3.590***	0.239	2.589***	0.409	3.458***	3.761***	3.944***
	(0.780)	0.648	(0.302)	(0.754)	(0.271)	(0.604)	(0.609)	(0.432)
Fixed effects	No	Yes	No	No	Yes	Yes	Yes	Yes
Observation	203	203	203	203	203	203	203	203
R-squared	0.149	0.403	-	-	-	-	-	-
F-statistic	-	-	-	15.74	-	14.27	156.42	10.65
Hansen J statistic	(Overidentification test of all instruments):						0.077	0.156
	Chi-sq (1) P-val =						0.781	0.693

OLS: Ordinary Least Square. Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B10. Effect of overseas educational experience on waste-separation practice.

	OLS	OLS	2SLS		2SLS	
			1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	−0.118	−0.041	-	−0.451	-	−0.440
	(0.117)	(0.129)	-	(0.363)	-	(0.434)
Male	−0.256**	−0.238**	0.040	−0.244**	0.001	−0.241**
	(0.117)	(0.118)	(0.063)	(0.118)	(0.060)	(0.118)
Age	−0.001	−0.005	0.001	0.004	0.008	0.003
	(0.011)	(0.011)	(0.008)	(0.013)	(0.008)	(0.015)
Spouse	0.147	0.149	−0.185**	0.093	−0.159**	0.093
	(0.145)	(0.145)	(0.075)	(0.160)	(0.074)	(0.160)
Volunteerism	0.127	0.129	−0.035	0.132	−0.031	0.132
	(0.136)	(0.136)	(0.062)	(0.134)	(0.059)	(0.134)
COVID-19	−0.125**	−0.131**	−0.011	−0.124**	0.003	−0.125*
	(0.063)	(0.064)	(0.034)	(0.062)	(0.030)	(0.064)
Self-transcendence	0.168*	0.174*	−0.027	0.159*	−0.036	0.160*
	(0.090)	(0.090)	(0.047)	(0.089)	(0.043)	(0.089)
General education	-	-	0.254***	-	0.215***	-
	-	-	(0.062)	-	(0.054)	-
Constant	2.868***	2.763***	0.241	3.031***	0.408	3.017***
	(0.575)	(0.588)	(0.301)	(0.569)	(0.271)	(0.597)
Country fixed effects?	No	Yes	No	No	Yes	Yes
Observation (N)	206	206	205	205	205	205
R-squared (R^2)	0.071	0.080	-	-	-	-
F-statistic	-	-	-	16.89	-	15.59

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B11. I plan to compost my garbage separated.

	OLS	OLS	2SLS		2SLS	
			1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	−0.196	−0.279	-	−1.017**	-	−1.291**
	(0.190)	(0.206)	-	(0.472)	-	(0.543)
Male	−0.443***	−0.463***	0.041	−0.406**	0.001	−0.466***
	(0.153)	(0.155)	(0.063)	(0.168)	(0.060)	(0.175)
Age	0.016	0.020	0.002	0.027	0.009	0.040*
	(0.017)	(0.017)	(0.008)	(0.020)	(0.008)	(0.024)
Spouse	−0.136	−0.138	−0.184**	−0.285	−0.159**	−0.291
	(0.210)	(0.210)	(0.075)	(0.249)	(0.074)	(0.255)
Volunteerism	0.303*	0.301*	−0.038	0.299*	−0.035	0.294*
	(0.162)	(0.162)	(0.062)	(0.162)	(0.058)	(0.163)
COVID-19	−0.063	−0.057	−0.013	−0.070	0.001	−0.049
	(0.086)	(0.086)	(0.033)	(0.092)	(0.030)	(0.092)
Self-transcendence	0.289**	0.281**	−0.028	0.273**	−0.037	0.249**
	(0.111)	(0.112)	(0.047)	(0.764)	(0.043)	(0.121)
General education	-	-	0.253***	-	0.214***	-
	-	-	(0.062)	-	(0.055)	-
Constant	0.717	0.831	0.244	1.096	0.410	1.457*
	(0.677)	(0.689)	(0.301)	(0.764)	(0.270)	(0.804)
Country fixed effects?	No	Yes	No	No	Yes	No
Observation (N)	207	207	206	206	206	206
R-squared (R^2)	0.121	0.123	-	-	-	-
F-statistic	-	-	-	16.76	-	15.40

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B12. Effect of overseas educational experience on shopping-bag usage.

	OLS	OLS	2SLS		2SLS		Ordered
			1st Stage	2nd Stage	1st Stage	2nd Stage	Probit
	[1]	[2]	[3]		[4]		[5]
Testing group	0.696***	0.579***	-	0.922**	-	0.834*	0.651***
	(0.163)	(0.170)	-	(0.371)	-	(0.429)	(0.199)
Male	−0.467***	−0.494***	0.428	−0.488***	0.003	−0.507***	−0.662***
	(0.140)	(0.136)	(0.063)	(0.139)	(0.050)	(0.135)	(0.176)
Age	−0.019	−0.013	0.001	−0.024	0.008	−0.019	−0.013
	(0.014)	(0.014)	(0.008)	(0.015)	(0.008)	(0.016)	(0.017)
Spouse	0.100	0.099	−0.181**	0.167	−0.154**	0.167	0.045
	(0.173)	(0.169)	(0.076)	(0.187)	(0.075)	(0.184)	(0.207)
Volunteerism	0.070	0.066	−0.036	0.096	−0.032	0.095	0.067
	(0.139)	(0.137)	(0.062)	(0.138)	(0.059)	(0.135)	(0.167)
COVID-19	−0.096	−0.086	−0.012	−0.083	0.003	−0.076	−0.118
	(0.075)	(0.77)	(0.034)	(0.075)	(0.031)	(0.076)	(0.093)
Self-transcendence	0.313***	0.303***	−0.028	0.306***	−0.037	0.299***	0.397***
	(0.105)	(0.103)	(0.047)	(0.105)	(0.051)	(0.104)	(0.133)
General education	-	-	0.254***	-	0.215***	-	-
	-	-	(0.062)	-	(0.054)	-	-
Constant	1.477**	1.639***	0.250	1.414**	0.420	1.534**	–
	(0.617)	(0.602)	(0.302)	(0.638)	(0.271)	(0.658)	–
Country fixed effects?	No	Yes	No	No	Yes	Yes	Yes
Observation (N)	205	205	204	204	204	204	205
R-squared (R^2)	0.220	0.234	-	-	-	-	-
F-statistic	-	-	-	16.88	-	15.58	-
/cut1	-	-	-	-	-	-	−0.860
/cut2	-	-	-	-	-	-	−0.127
/cut3	-	-	-	-	-	-	0.872
/cut4	-	-	-	-	-	-	2.347

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B13. Effect of overseas educational experience on shopping-bag usage.

	Self-transcendence	X8	X9	X11	X13	X14	X15	Male	Volunteerism	COVID-19
Self-transcendence	1	-	-	-	-	-	-	-	-	-
X8	−0.16**	1	-	-	-	-	-	-	-	-
X9	−0.24***	0.40***	1	-	-	-	-	-	-	-
X11	−0.13**	0.25***	0.12	1	-	-	-	-	-	-
X13	0.22***	−0.16**	−0.10	−0.17**	1	-	-	-	-	-
X14	0.14**	−0.17**	−0.06	−0.13	0.30***	1	-	-	-	-
X15	0.18***	−0.06	−0.18***	−0.04	0.33***	0.25***	1	-	-	-
Male	−0.23***	−0.11	−0.07	−0.01	−0.26***	−0.17**	−0.03	1	-	-
Volunteerism	0.15**	−0.02	−0.06	−0.01	0.21***	0.11	0.05	−0.18***	1	-
COVID-19	0.18***	0.06	0.16**	0.01	−0.02	−0.05	−0.07	−0.07	0.03	1

Note: X8: Is waste separation difficult? X9: Don't you have time for waste separation? X11: Is improved waste collection necessary? X13: Do you intend to compost the waste separated? X14: Do you intend to sell the wastes separated? X15: Do you intend to separate waste into organic and non-organic? $*p < 0.10$, $**p < 0.05$, $***p < 0.01$.

Table B14. I plan to separate my garbage into organic and non-organic.

	OLS	OLS	2SLS		2SLS	
			1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]		[4]	
Testing group	−0.047	−0.103	-	−0.055	-	−0.122
	(0.114)	(0.126)	-	(0.270)	-	(0.312)
Male	0.007	−0.007	0.040	0.004	0.001	−0.011
	(0.105)	(0.108)	(0.063)	(0.104)	(0.060)	(0.105)
Age	0.005	0.007	0.001	0.004	0.008	0.007
	(0.011)	(0.011)	(0.008)	(0.012)	(0.008)	(0.012)
Spouse	0.024	0.023	−0.185**	0.031	−0.159**	0.030
	(0.131)	(0.131)	(0.075)	(0.139)	(0.074)	(0.138)
Volunteerism	0.030	0.029	−0.035	0.039	−0.031	0.038
	(0.106)	(0.106)	(0.062)	(0.104)	(0.059)	(0.104)
COVID-19	−0.091	−0.086	−0.011	−0.087	0.003	−0.082
	(0.060)	(0.061)	(0.034)	(0.060)	(0.030)	(0.060)
Self-transcendence	0.247**	0.242**	−0.027	0.243**	−0.036	0.237**
	(0.097)	(0.098)	(0.047)	(0.096)	(0.043)	(0.645)
General education	-	-	0.254***	-	0.215***	-
	-	-	(0.062)	-	(0.054)	-
Constant	2.125***	2.202***	0.241	2.143***	0.408	2.232***
	(0.602)	(0.617)	(0.301)	(0.612)	(0.271)	(0.645)
Country fixed effects?	No	Yes	No	No	Yes	Yes
Observation (N)	206	206	205	205	205	205
R-squared (R^2)	0.052	0.057	-	-	-	-
F-statistic	-	-	-	16.89	-	15.59

Standard errors are in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

Table B15. Average marginal effects after ordered probit.

	Marginal Effects				
	Never	Rarely	Sometimes	Often	Always
	[1]	[2]	[3]	[4]	[5]
Testing group	−0.028**	−0.072***	−0.141***	0.099**	0.143***
	(0.014)	(0.027)	(0.047)	(0.041)	(0.043)
Observations (N)	207	207	207	207	207

Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Interaction Effect:

To make sure if people engaged in social and environmental affairs (volunteerism) will practice waste separation regardless of how inconvenient the waste management system is, I interacted the dummy variable of overseas educational experience with *volunteerism* variable (regression 5, Table B9). The result is robust to the claim with coefficient ($\beta = 0.497$, $p < 0.05$) with F-statistic = 156.42. On contrary, the interaction effect between the coefficient of overseas educational experience and *self-transcendence* is statistically insignificant ($\beta = 0.088$, $p > 0.05$) with small F-statistic = 10.65 (regression 6, Table B9).

Average Marginal Effects:

The probability of sorting garbage among the fellows is statistically insignificant upon their arrival in Cambodia (regression 4, Table B9). However, the probability of using shopping bag is statistically significant (regression 4 & 5, Table B12) even after their arrival at their home country. The coefficient of average marginal effect is all negative in the first bottom three categories: *never*, *rarely* and *sometimes* but positive for *often* and *always* (Table B15). Therefore, experiencing overseas education decreases the probability of not using shopping bag but increases the probability of using it by approximately 11% and 16% for category "often" and "always" respectively.