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Research Article

Model of IQ, MQ, AQ and environmental education influencing conservation behavior

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Abstract - The objective was to propose a structural model of the Intelligence Quotient (IQ), Moral Quotient (MQ), Adversity Quotient (AQ) and Environmental Education (EE) that influences Conservation Behavior (CB) through Inspiration of Public Consciousness (IPC). The population was 35,450 undergraduate students of Mahasarakham University in the academic year of 2014. A multi-stage simple random sampling technique was employed to collect the sample for 400 undergraduate students. The research instrument was a questionnaire and it was used for data collection. LISREL was used for model verification.

The results illustrated that IPC had the most effect on CB with an effect of 0.62 and the subsequences were EE, MQ, AQ and IQ with effects of 0.46, 0.38, 0.34 and 0.23, respectively. They were able to explain the variation of CB with 97.70 percent. Additionally, EE had the most effect on IPC with an effect of 0.46. Subsequences were AQ, MQ and IQ with effects of 0.32, 0.31 and 0.21, respectively. These were able to explain the variation of IPC with 93.00 percent.

Keywords: Model IQ, MQ, AQ, Environmental Education, Conservation Behavior, Inspiration of Public Consciousness

1. Introduction

Most people assume that global warming is caused by burning oil and gas, but in fact between 25 and 30 percent of the greenhouse gases released into the atmosphere each year, with 1.6 billion tons, is caused by deforestation. The national science academies of all the major industrialized countries realized that the green house gas effect was due to human activities. However, global warming has become a noteworthy issues for ordinary people who are directly influenced by earth quakes, floods and droughts (FAO, 2006; United States National Academy of Sciences, 2008; National Research Council of USA, 2010; Thiengkamol, 2011a). To accomplish the environmental conservation behavior, it is necessary to understand the various features of human Intelligence Quotient (IQ), Moral Quotient (MQ) and Adversity Quotient (AQ) with the integration of an Environmental Education (EE) Process based on Inspiration of Public Consciousness (IPC).

Notwithstanding, the relationship of IQ between genetic inheritance and natural environment is doubtful. Some still believe that it is directly connect to biological parental IQ. However, the heritability of IQ has been examined for nearly a century, and the importance of heritability estimates and the mechanisms of inheritance are still discussed (Neisser *et al*., 1996; Neisser, 1997; Devlin *et al*., 1997; Deary and Batty, 2007; Turkheimer, 2008; Johnson *et al*., 2009). Consequently, Dickens and Flynn (2002) offered a model for determining several uncertain conclusions involving IQ. In their model, an environmental stimulus can have a very great effect on IQ, even for adults, but this effect also decays over time unless the stimulus continues. The model could be adapted to embrace probable factors, like nutrition during early childhood that may cause stable effects. Therefore, IQ change can be explained by a generally more stimulating environment for all people. The study concluded that IQ scores do have high predictive validity for individual differences in school achievement. They validate the predictive validity of IQ for adult occupational status, even when variables such as education and family conditions have been statistically controlled. They suggested that individual differences in intelligence come from both genetics and environment, but it still is not identified which one is the major influence (Dickens and Flynn, 2001; 2002).

MQ is considered in terms of generalization and environmental ethics. Morality differs from intentions, opinions and actions between those that are good or right and those that are bad or wrong. A moral code is a system of morality in relation to a particular philosophy, religion and culture; therefore, morality is any one practice or teach-

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ing within a moral code. Morality may also be specifically identical with "goodness" or "rightness." Immorality is the active opposition to morality, while amorality is variously defined as an ignorance of, indifference toward or doubt in any set of moral standards or principles (Dictionary.com, 2010; Johnstone, 2008; Superson, 2009; Wiktionary, 2010). An example of a moral code is the Golden Rule that states, "One should treat others as one would like others to treat oneself" (Antony, 1979).

AQ is the capability to solve problems and overcome struggles with difficulties with the aim to find a way to change the crisis to be an opportunity and with higher mind power. The person who has good AQ will be an optimist and he or she will turn obstructions into opportunities. The fundamental component of human effectiveness must have something to deal with how people respond to the complicated side of life, or hardship. People have the strength to respond to difficulties in life, such as annoyances, aggravations and hindrances to the most unsatisfactory difficulties (Peterson and Seligman, 2004; Seligman, 2002; 2004; Stoltz, 1997; Duckworth and Seligman, 2006). There was evidence from our lives of responses to difficult issues, annoyances and obstructions that are the most serious problems that involve a superficial role in all human effort (Stoltz, 1997; Seligman, 2002; 2004; Peterson and Seligman, 2004; Duckworth and Seligman, 2006).

EE is essential to promoting sustainable development through raising the people's capability to focus on environmental and developmental issues. Particularly, it should be administered through all educational channels of formal, informal, non-formal and lifelong education to foster awareness and attitude, to cultivate the consciousness, to take responsibility and to practice skill for achieving better environmental behavior with inspiration of public mind or public consciousness. The principle of EE is consistent with Sustainable Development (SD) in terms of increasing environmental knowledge and understanding, changing people's attitudes and awareness, to have appropriate values and skills to take responsibility for environmental conservation behavior based on inspiration of public mind and for effective public participation in decision-making. Moreover, for the effectiveness of EE and SD they should deal with the dynamics of both the physical/biological and socio-economic environment and human (which may include spiritual) development, which should be integrated in all disciplines with effective means of communication (WCED, 1987; Thiengkamol, 2011a; 2011b; 2011c; 2012a; 2012b).

Thiengkamol discovered, from a variety of research, the IPC or public mind, therefore she identified that it might arise from one's insight without any stimulant or it might happen due to one's sensitivity from a role model, event, environment and media source. It is different from motivation because inspiration needs no rewards. IPC or public mind, in particular, for natural resources and environment conservation, one does not receive any inducement, admiration or appreciation for ones perform for natural resources and environment conservation (Thiengkamol, 2009a ; 2009b ; 2011a; 2011b).

Research about IQ, MQ, AQ and EE influencing environmental behavior for global warming alleviation through IPC, including persons as role model, impressive events, impressive environment and media perception is rarely seen (Thiengkamol, 2011c; 2013a; 2013b; Koonboonchan, 2015; Gonggool *et al*, 2012b). At present, it is very seldom used to conduct a holistically integrative with IQ, MQ and AQ when compared with other aspects of relating factors influencing the environmental behavior for global warming alleviation.

Therefore, this research was designed to study all factors mentioned above, so it would be able to develop a model of environmental conservation behavior that is influenced by IQ, MQ, AQ and EE through IPC.

2. Objective

The objective was to propose a structural model of IQ, MQ, AQ and EE influencing conservation behavior through IPC.

3. Methodology

The research design was conducted in a methodical order as follows:

Firstly, the population was 35,450 undergraduate students of Mahasarakham University in the second semester of the academic year of 2014. Multi-stage random sampling was conducted to collect 400 undergraduate students from different faculties of Mahasarakham University.

Secondly, the research tool was a questionnaire that was used for data collection. It was composed of 125 items with a five level rating scale (Likert's Rating Scale with 5 = Strongly Agree, 4 = Agree, 3 = Neither Agree nor Disagree, 2 = Disagree, and 1 = Strongly Disagree). The constructs and variables are shown in Table 1.

Thirdly, the content and structural validity were determined by Item Objective Congruent (IOC) with five experts in the aspects of environmental education, psychology, social science and social research methodology. The reliability was determined using a sample group of 50 undergraduate students from Rajabhat Mahasarakham University, which is near Mahasarakham University. The reliability was determined by Cronbach's Alpha. The reliabilities of the IQ, MQ, AQ, EE, IPC, Conservation Behaviors (CB) and the whole questionnaire were 0.895, 0.889, 0.880, 0.972, 0.975, 0.966 and 0.969, respectively. Lastly, the descriptive statistics used were frequency, percentage, mean and standard deviation. The inferential statistics used were in LISREL by considering how Chi-Square values differ from zero with no statistical significance at the 0.05 level or Chi-Square/df value less or equal to 5; RMSEA (Root Mean Square Error Approximation) value of less than 0.05, including index level of model congruent value; and GFI (Goodness of Fit Index) and index level of model congruent value and AGFI (Adjust Goodness of Fit Index) between 0.90-1.00.

Table 1. Constructs, variables and number of items.

Constructs	Variables	Number of Items
Intelligence Quotient (IQ)	X1 Conceptual Creation	15
	X2 Talent Expression	
	X3 Relationship Perception	
Moral Quotient (MQ)	X4 General Ethics	15
	X5 Personal Ethics	
	X6 Social Norm	15
Adversity Quotient (AQ)	X7 Personal Challenge	
	X8 Family Challenge	
	X9 Social Challenge	30
Environmental Education (EE)	X10 Knowledge and Understanding	
	X11 Environmental Awareness	
	X12 Environmental Attitude	
	X13 Environmental Skill	20
Inspiration of Public Consciousness (IPC)	X14 Environmental Participation	
	X15 Environmental Evaluation	
	Y7 Person as Role Model	30
	Y8 Impressive Event	
Conservation Behaviors (CB)	Y9 Impressive Environment	
	Y10 Media Receiving	
	Y1 Consumption Behavior	
	Y2 Energy Conservation Behavior	
	Y3 Recycling Behavior	
	Y4 Waste Management Behavior	
	Y5 Travelling Behavior	
	Y6 Knowledge Transferring for Environmental Conservation	

4. Results

4.1 Confirmatory Factors Analysis of Exogenous Variables of IQ

The results of the confirmatory factor analysis of exogenous variables of IQ influencing CB can be revealed as in the following.

Confirmatory factors of IQ had a Bartlett's test of Sphericity of 176.89 at the statistically significant level of 0.01 and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA of 0.64. This indicated that the components of the IQ aspect had a proper relationship at a good level and it can be used for the analysis of the confirmatory factors as shown in Figure 1 and Table 2.

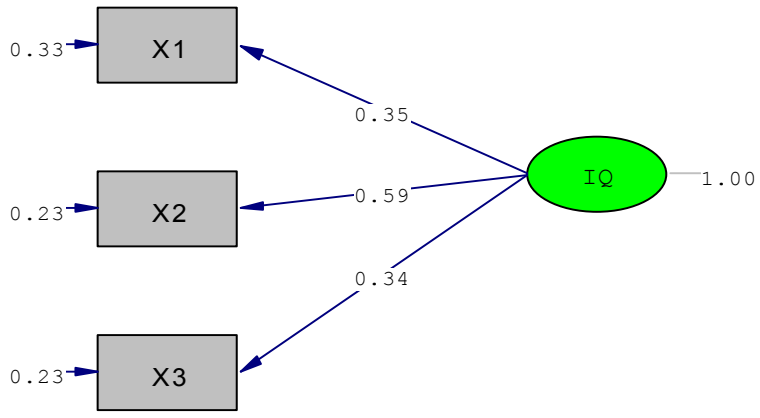


Figure 1. Model of confirmatory factors of Intelligence Quotient.

Table 2. Results of analysis of confirmatory factors of Intelligence Quotient.

Components of Moral Quotient	Weight	SE	t	R^2
X1 Conceptual Creation	0.35	0.04	8.75**	0.27
X2 Talent Expression	0.59	0.05	11.12**	0.60
X3 Relationship Perception	0.34	0.04	9.37**	0.34
Chi-square = 0.00 df = 0 P = 1.00000				
GFI =1.00 AGFI =1.00 RMSEA = 0.000 RMR =0.000				

** Statistically significant level of 0.01

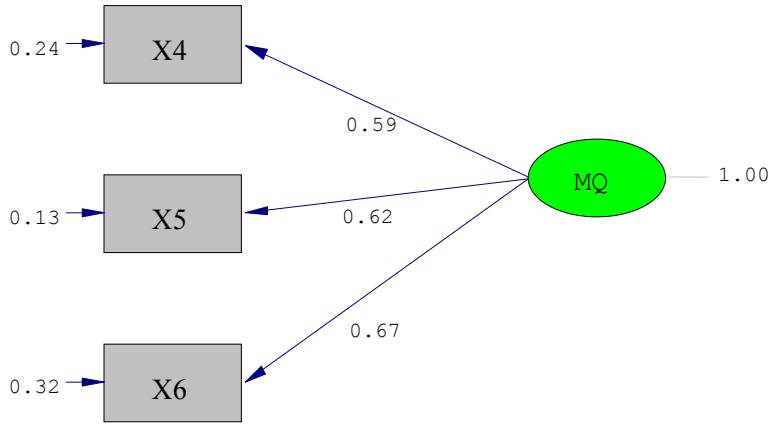
From Figure 1 and Table 2, the results of the analysis of confirmatory factors of the IQ from the three observed variables revealed that the model was congruent to the empirical data by considering: 1) GFI equaled 1.00 and AGFI equaled 1.00, 2) RMSEA equaled 0.035 (RMSEA < 0.05) and 3) Chi- Square value had no statistically significance at level of 0.01, while the Chi-Square value when divided by the degree of freedom was less than or equal to 5.00 ($\chi^2/df \leq 5.00$).

Considering the loading weight of the three observed variables in the model, it was revealed that the observed variables had loading weights with 0.34 to 0.59 and had a covariate to the model of the IQ with 27.00 to 60.00 percent.

4.2 Confirmatory Factors Analysis of Exogenous Variables of MQ

The confirmatory factor analysis of exogenous variables of MQ influencing CB was revealed as in the following.

The confirmatory factors of MQ had a Bartlett's test of Sphericity of 500.37 at the statistically significant level of 0.01, and a Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA of 0.72. This indicated that the components of the MQ aspect had proper relationships at a good level and it can be used for the analysis of confirmatory factors as shown in Figure 2 and Table 3.



Chi-Square=0.00, df=0, P-value=1.00000, RMSEA=0.000

Figure 2. Results of analysis of confirmatory factors of Moral Quotient.

Table 3. Results of analysis of confirmatory factors of Moral Quotient.

	Components of Moral Quotient	Weight	SE	t	R^2
X4	General Ethics	0.59	0.04	16.84**	0.60
X5	Personal Ethics	0.62	0.03	19.29**	0.75
X6	Social Norm	0.67	0.04	16.17**	0.59
	Chi-square = 0.00 df = 0 P = 1.00000				
	GFI =1.00 AGFI =1.00 RMSEA = 0.000 RMR =0.000				

** Statistically significant level of 0.01

From Figure 2 and Table2, the results of the analysis of the confirmatory factors of the MQ from the three observed variables revealed that the model was congruent to the empirical data by considering: 1) GFI equaled 1.00 and AGFI equaled to 1.00, 2) RMSEA equaled 0.000 (RMSEA < 0.05) and 3) Chi- Square value had no statistically significant at level of 0.01, and when divided by the degree of freedom was less than or equal to 5.00 ($\chi^2/df \leq 5.00$).

Considering the loading weight of the observed variables in the model, it was revealed that the observed variables had a loading weight of 0.59 to 0.67 and had a covariate to the model of MQ with 59.00 to 75.00 percent.

4.3 Results of Confirmatory Factors Analysis of Exogenous Variables of AQ)

The confirmatory factor analysis of the exogenous variables of the AQ influencing the CB was revealed as following.

The confirmatory factors of AQ had a Bartlett's test of Sphericity of 339.97 at the statistically significant level of 0.01, and a Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA of 0.69. This indicated that the components of the AQ aspect had a proper relationship at a good level and it can be used for the analysis of the confirmatory factors as shown in Figure 3 and Table 4.

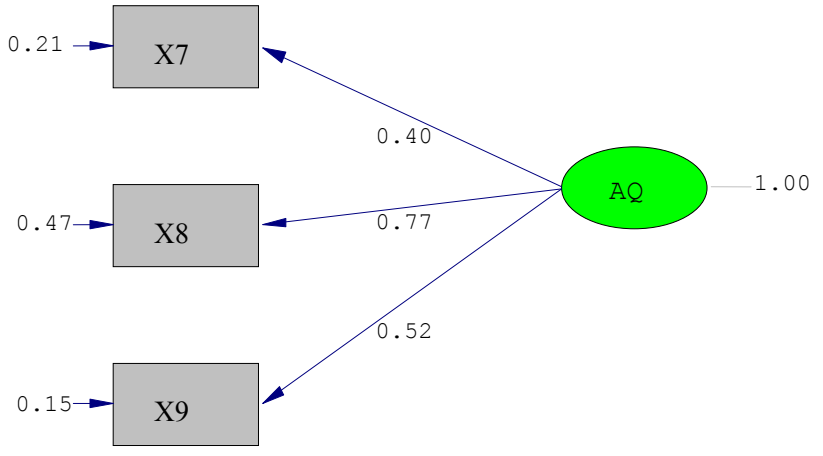


Figure 3. Results of analysis of confirmatory factors Adversity Quotient.

Table 4. Results of analysis of confirmatory factors of Adversity Quotient.

	Components Adversity Quotient	Weight	SE	t	R^2
X7	Personal Challenge	0.40	0.03	13.14**	0.44
X8	Family Challenge	0.77	0.05	14.75**	0.56
X9	Social Challenge	0.52	0.03	15.85**	0.65
	Chi-square = 0.00 df = 0 P = 1.00000				
	GFI =1.00 AGFI =1.00 RMSEA = 0.000 RMR =0.000				

** Statistically significant level of 0.01

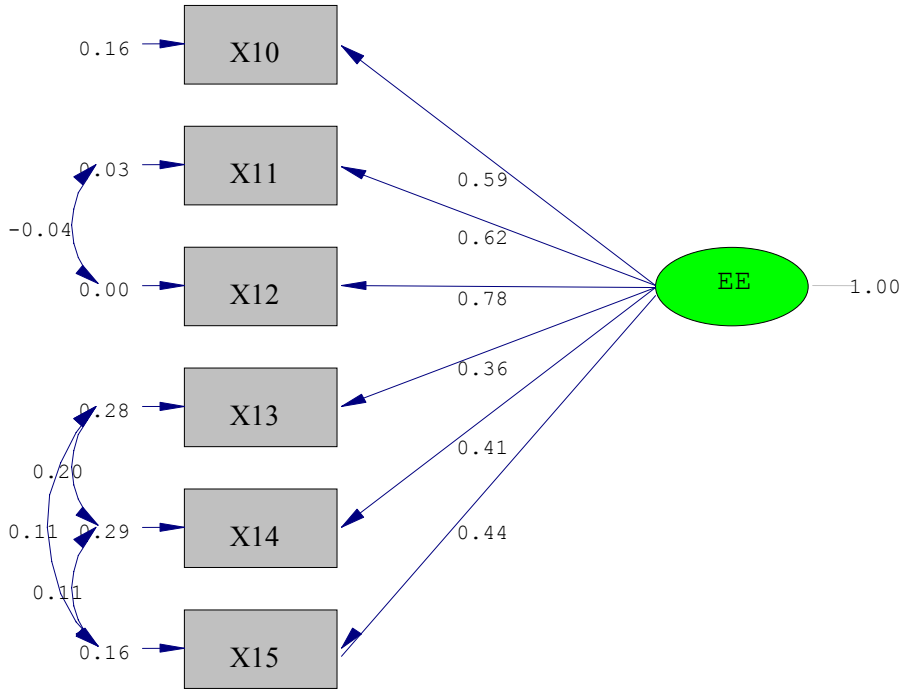
From Figure 3 and Table 4, the results of the analysis of the confirmatory factors of the AQ from the three observed variables revealed that the model was congruent to the empirical data by considering: 1) GFI equaled 1.00 and AGFI equaled 1.00, 2) RMSEA equaled 0.000 (RMSEA < 0.05) and 3) Chi- Square value had no statistical significance at level of 0.01, and when divided by the degree of freedom was less than or equal to 5.00 ($\chi^2/df \leq 5.00$).

Considering the loading weight of the observed variables in the model, it was revealed that the observed variables had a loading weight with 0.40 to 0.77 and had a covariate to the model of the AQ with 44.00 to 65.00 percent.

4.4 Confirmatory Factor Analysis of Exogenous Variables of (EE)

The confirmatory factor analysis of the exogenous variables of the EE influencing the CB was revealed as follows.

The confirmatory factors of EE had a Bartlett's test of Sphericity of 2115.47 at the statistically significant level (p< .01) and a Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA of 0.86. This indicated that the components of the EE aspect had a proper relationship at a good level and it can be used for analysis of the confirmatory factors as shown in Figure 4 and Table 5.



Chi-Square=7.83, df=5, P-value=0.16603, RMSEA=0.038

Figure 4. Model of confirmatory factor of Environmental Education.

Table 5. Results of analysis of confirmatory factor of Environmental Education.

	Components of Environmental Education	Weight	SE	t	R^2
X10	Knowledge and Understanding	0.59	0.030	19.38**	0.68
X11	Environmental Awareness	0.62	0.026	24.14**	0.93
X12	Environmental Attitude	0.78	0.030	25.70**	0.99
X13	Environmental Skill	0.36	0.030	12.11**	0.31
X14	Environmental Participation	0.41	0.031	13.13**	0.36
X15	Environmental Evaluation	0.44	0.026	16.76**	0.54

Chi-square = 7.83 df = 5 P = 0.16603

GFI = 0.99 AGFI = 0.97 RMSEA = 0.038 RMR =0.0032

** Statistically significant level of 0.01

From Figure 4 and Table 5, the results of the analysis of the confirmatory factors of EE from the five observed variables revealed that the model was congruent to the empirical data by considering: 1) GFI equaled 0.99 and AGFI equaled 0.97, 2) RMSEA equaled 0.041 (RMSEA < 0.05) and 3) Chi- Square value had no statistical significance at level of 0.01, and when divided by the degree of freedom was less than or equal to 5 ().

Considering the loading weight of the six observed variables in the model, it was revealed that the observed variables had loading weights with 0.36 to 0.78 and had a covariate to the model of the EE with 31.00 to 99.00 percent.

4.5 Confirmatory Factors Analysis of Endogenous Variables of IPC for Environmental Conservation

The confirmatory factors analysis of endogenous variables of IPC for environmental conservation influencing CB was revealed as in the following.

The confirmatory factors of IPC for environmental conservation had a Bartlett's test of Sphericity of 1280.48 at the statistically significant level ($p < 0.01$) and a Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA of 0.85. This indicated that the components IPC for environmental conservation aspect had a proper relationship at a good level and it can be used for analysis of the confirmatory factors as shown in Figure 5 and Table 6.

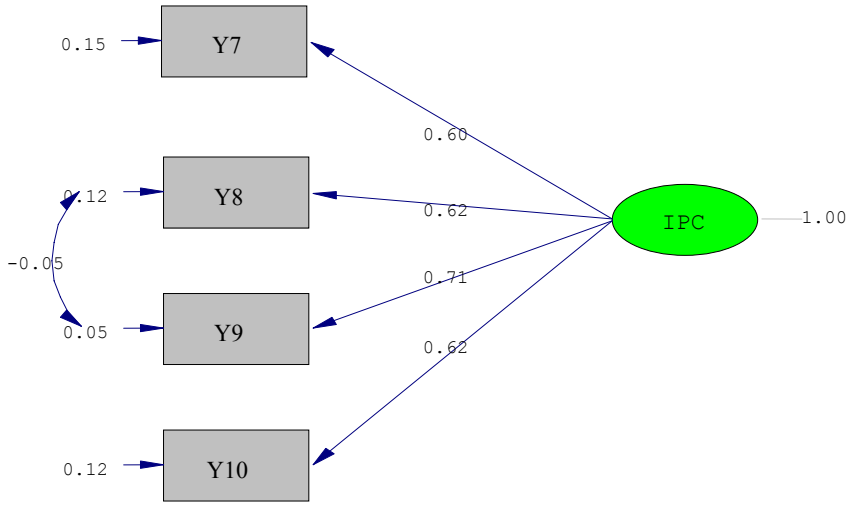


Figure 5. Model of confirmatory factor of Inspiration of Public Consciousness for environmental conservation.

Table 6. Results of analysis of confirmatory factor of Inspiration of Public Consciousness for environmental conservation.

Confirmatory Factor of Public Consciousness for Environmental Conservation	Weight	SE	t	R^2
Y7 Person as Role Model	0.60	0.029	20.39**	0.70
Y8 Impressive Event	0.62	0.030	21.04**	0.76
Y9 Impressive Environment	0.71	0.029	24.80**	0.92
Y10 Media Receiving	0.62	0.028	21.69**	0.76
Chi-square = 1.84 df = 1 P = 0.17496				
GFI = 1.00 AGFI = 0.98 RMSEA = 0.046 RMR = .0030				

** Statistically significant level of 0.01

From Figure 5 and Table 6, the results of the analysis of the confirmatory factors of IPC from the four observed variables revealed that the model was congruent to the empirical data by considering: 1) GFI equaled 1.00 and AGFI equaled 0.98, 2) RMSEA equaled 0.046 (RMSEA < 0.05) and 3) Chi-Square value had no statistical significance at level of 0.01, and when divided by the degree of freedom was less than or equal to 5.00 ($\chi^2/df \leq 5.00$).

Considering the loading weight of the four observed variables in the model, it was revealed that the observed variables had loading weights with 0.60 to 0.71 and had a covariate to the model of IPC for environmental conservation with 70.00 to 92.00 percent.

4.6 Confirmatory Factors Analysis of Endogenous Variables of CB

The confirmatory factors of CB had a Bartlett's test of Sphericity of 1409.30 at the statistically significant level

(p< 0.01) and a Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA of 0.83. This indicated that the components of the CB aspect had a proper relationship at a good level and it can be used for analysis of the confirmatory factors as shown in Figure 6 and Table 7.

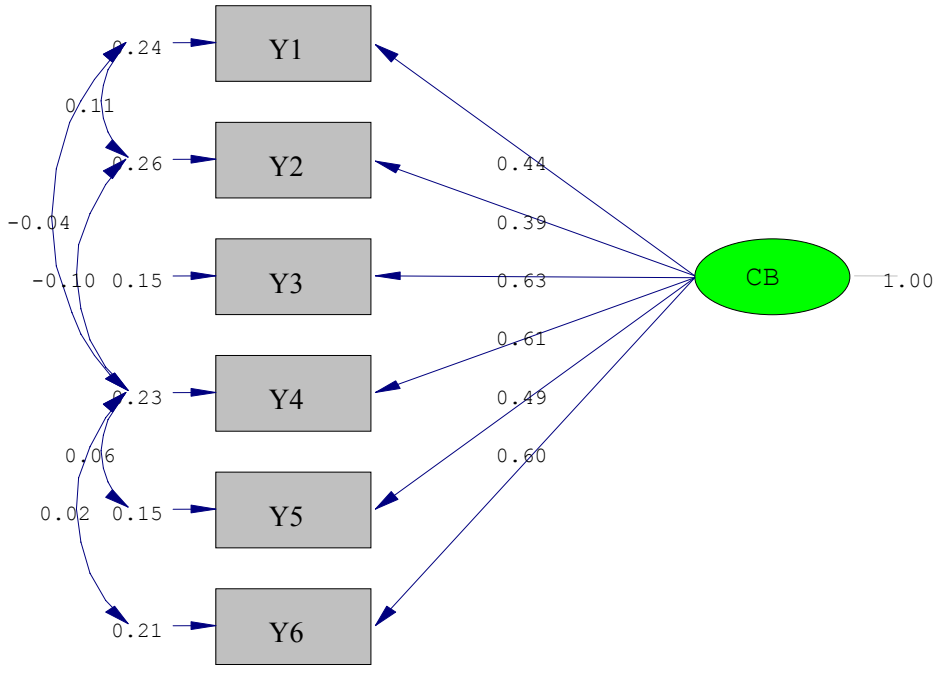


Figure 6. Model of confirmatory factors of Conservation Behaviors.

Table 7. Results of analysis of confirmatory factors of Conservation Behavior.

	Confirmatory Factors of Conservation Behaviors (CB)	Weight	SE	t	R^2
Y1	Consumption Behavior	0.44	0.031	14.21**	0.45
Y2	Energy Conservation Behavior	0.39	0.031	12.70**	0.37
Y3	Recycling Behavior	0.63	0.031	19.89**	0.73
Y4	Waste Management Behavior	0.61	0.036	16.78**	0.62
Y5	Travelling Behavior	0.49	0.028	17.52**	0.61
Y6	Knowledge Transferring for Environmental Conservation	0.60	0.0.8	18.00**	0.63
Chi-square = 4.94 df = 4 P = 0.29356					
GFI = 1.00 AGFI = 0.98 RMSEA = 0.024 RMR = 0.0055					

** Statistically significant level of 0.01

From Figure 6 and Table 7, the results of analysis of the confirmatory factors of the environmental behaviors for global warming alleviation from the six observed variables revealed that the model was congruent to the empirical data by considering: 1) GFI equaled 1.00 and AGFI equaled 98, 2) RMSEA equaled 0.000 (RMSEA < 0.05) and 3) Chi- Square value had no statistical significance at the level of 0.01, and when divided by the degree of freedom was less than or equal to 5.00 ($\chi^2/df \leq 5.00$).

Considering the loading weight of the six observed variables in the model, it was revealed that the observed variables had loading weights with 0.39 to 0.63 and had a covariate to the model of environmental behaviors for global warming alleviation with 37.00 to 73.00 percent.

4.7 Results of Effects among Variables in Model in Terms of Direct Effect

1) The confirmatory factors of the IQ had direct effects to the IPC for environmental conservation and CB with statistical significance at the level of 0.01 with effects of 0.27 and 0.25. Moreover, the confirmatory factors in the aspect of the IQ had indirect effects on the CB with statistical significance at the level of 0.01 with an effect of 0.20.

2) The confirmatory factors of the MQ had a direct effect on the IPC for environmental conservation and CB with statistical significance at the level of 0.01 with effects of 036 and 0.34. Moreover, the MQ had an indirect effect on the CB with statistical significance at the level of 0.01 with an effect of 0.23.

3) The confirmatory factors of the AQ had a direct effect on the IPC for environmental conservation and CB with statistical significance at the level of 0.01 with effects of 0.37 and 0.35. Moreover, the confirmatory factors in the aspect of the AQ had indirect effects on the CB with statistical significance at the level of 0.01 with effects of 0.24.

4) The confirmatory factors of the EE had a direct effect on the IPC for environmental conservation and CB with statistical significance at the level of 0.01 with effects of 0.37 and 0.39. Moreover, the confirmatory factors in the aspect of the EE had indirect effects on the CB with no statistical significance at the level of 0.05 with an effect of 0.22.

5) The confirmatory factors on the IPC for environmental conservation had a direct effect on the CB with statistical significance at the level of 0.01 with an effect of 0.62.

6) When considering the structural model confirmatory factors of the IQ, MQ and AQ were able to explain the variation in the endogenous factors on the IPC for environmental conservation to cause CB with 97.70 percent, as in equation (1).

BEH = 0.23*IQ+0.38*MQ+0.34*AQ +0.46*EE+ 0.62*IPC……..(1)

(R^2 = 0.977)

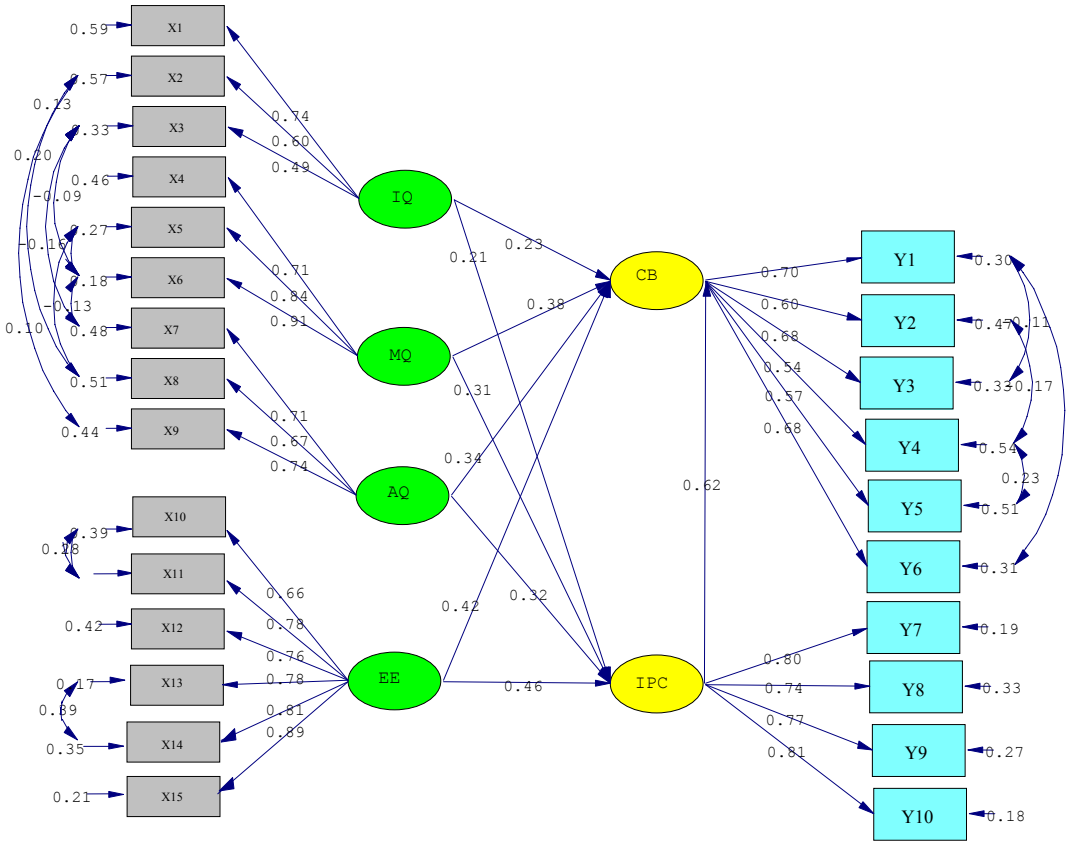
The factors in equation (1) that had the most effect on the CB were the IPC with an effect of 0.62 and followed by EE, MQ, AQ and IQ with effects of 0.46, 0.38, 0.34 and 0.23, respectively. These were able to explain the variation in the CB by 97.70 percent.

Consequently, the confirmatory factors on the IQ, MQ and AQ were able to explain the variation in the confirmatory factors on the IPC for environmental conservation with 93.00 percent. Therefore, the equation can be written as in equation (2).

IPC = 0.46*EE+0.21*IQ+0.31*MQ + 0.32*AQ ……(2)

(R^2 = 0.93)

The factors in equation (2) that had the most effect on the IPC for environmental conservation were EE with an effect of 0.46 and followed by AQ, MQ and IQ with effects of 0.32, 0.31 and 0.21, respectively. These were able to explain the variation on the IPC for environmental conservation with 93.00 percent.



Chi-Square=623.01, df=349, P-value=0.10912, RMSEA=0.031

Figure 7. Model of direct and indirect effects of IQ, MQ, AQ and EE through IPC influencing CB.

Table 8. Direct and indirect effects of IQ, MQ, AQ and EE through IPC influencing CB.

Causal variable	Result variables					
	IPC			CB		
	TE	IE	DE	TE	IE	DE
IQ	0.21* (0.035)	-	0.21* (0.035)	0.42* (0.033	0.13** (0.025)	0.29** (0.038)
MQ	0.31** (0.032)	-	0.31** (0.032)	0.50** (0.016)	0.19** (0.025)	0.31** (0.032)
AQ	0.32** (0.035)	-	0.32** (0.035)	0.53** (0.024)	0.20** (0.018)	0.32** (0.035)
EE	0.46** (0.029)	-	0.46** (0.029)	0.75** (0.019)	0.29** (0.021)	0.46** (0.029)
IPC	-	-	-	0.62** (0.052)	-	0.62** (0.052)
χ^2= 623.01; df = 349			CN = 248.99		χ^2/df= 1.785	
GFI = 0.94; AGFI = 0.91			RMSEA = 0.031		RMR = 0.042	

5. Discussion

The findings indicated that the confirmatory factors of IQ had a direct effect to CB at the statistically significant level of 0.01 with an effect of 0.23, and had indirect effects on CB at the statistically significant level of 0.01 with an effect of 0.13. Additionally, IQ had a direct effect to IPC at the statistically significant level of 0.01 with an effect of 0.21. This implies that IQ plays an important role in altering CB via IPC for both direct and indirect aspects.

It might be concluded that IQ is composed of Conceptual Creation (X1), Talent Expression (X2) and Relationship Perception (X3) influences CB composed of Consumption Behavior (Y1), Energy Conservation Behavior (Y2), Recycling Behavior (Y3), Waste Management Behavior (Y4), Travelling Behavior (Y5) and Knowledge Transferring for Environmental Conservation (Y6) through IPC, hence the results of this study are in line with the studies of Thiengkamol and her colleagues (Thiengkamol, 2011c; 2012a; 2012b; 2012d; 2013a; Donkonchum *et al*., 2012a; Gonggool *et al*., 2012b; Morrasri *et al*, 2012b; Koonboonchan, 2015).

The findings indicated that the confirmatory factors of the MQ had a direct effect on the CB at the statistically significant level of 0.01 with an effect of 0.38, and had an indirect effect on the CB at the statistically significant level of 0.01 with an effect of 0.18. Moreover, the MQ had a direct effect on the IPC at the statistically significant level of 0.01 with an effect of 0.31.

It might be concluded that the MQ is composed of General Ethics (X4), Personal Ethics (X5) and Social Norm (X6) that influences the CB composed of Consumption Behavior (Y1), Energy Conservation Behavior (Y2), Recycling Behavior (Y3), Waste Management Behavior (Y4), Travelling Behavior (Y5) and Knowledge Transferring for Environmental Conservation (Y6) through IPC, therefore the results of this study are in line with the studies of Thiengkamol and her colleagues (Thiengkamol, 2011c; 2012a; 2012b; 2012d; 2013a; Donkonchum *et al*., 2012a; Gonggool *et al*., 2012b; Morrasri *et al*, 2012b; Waewthaisong *et al*., 2012a).

Concurrently, the results revealed that the confirmatory factors of the AQ had direct effects on the CB at the statistically significant level of 0.01 with an effect of 0.34, and had indirect effects on the CB at the statistically significant level of 0.01 with an effect of 0.21. Furthermore, the AQ had direct effects on the IPC at the statistically significant level of 0.01 with an effect of 0.32.

Therefore, it is evidence that the AQ is composed of Personal Challenge (X7), Family Challenge (X8) and Social Challenge (X9) that influenced the CB through IPC composed of Person as Role Model (Y7), Impressive Event (Y8), Impressive Environment (Y9) and Media Receiving (Y10), therefore the results of this study are harmonious with the studies of Thiengkamol and her colleagues (Thiengkamol, 2011c; 2012a; 2012b; 2012c; 2013b; Donkonchum *et al*., 2012a; Gonggool *et al*., 2012b; Morrasri *et al*, 2012b; Koonboonchan, 2015).

Moreover, the EE had direct effects on the CB at the statistically significant level of 0.01 with an effect of 0.42, and had indirect effects on the BEH at the statistically significant level of 0.01 with an effect of 0.29. Furthermore, the EE had direct effects on the IPC at the statistically significant level of 0.01 with an effect of 0.46.

Therefore, it is clearly seen that the EE is composed of Knowledge and Understanding (X10), Environmental Awareness (X11), Environmental Attitude (X12), Environmental Skill (X13), Environmental Participation (X14) and Environmental Evaluation (X15) influencing the CB through IPC composed of Person as Role Model (Y7), Impressive Event (Y8), Impressive Environment (Y9) and Media Receiving (Y10), therefore the results of this study are harmonious with the studies of Thiengkamol and her colleagues (Thiengkamol, 2011c; 2012a; 2012b; 2012c; Donkonchum *et al*., 2012a; Gonggool *et al*., 2012b; Morrasri *et al*, 2012b). The exogenous factors of the IQ, MQ, AQ and EE were able to explain the variation in the

endogenous factors of IPC caused CB by 97.70 percent.

The model of IQ, MQ, AQ and EE influencing the CB through IPC was verified by the proposed model that was fitted with all the observed variables according to the criteria of the Chi-Square value that differed from zero with no statistical significance at the 0.05 level or Chi-Square/df value less than or equal to five and RMSEA value less than 0.05 including the index level of the model congruent value, GFI and index level of model congruent value, AGFI between 0.90-1.00.

Therefore, it might be concluded that IQ, MQ, AQ and EE play very important roles in creating the environmental behavior of the consumption behavior, energy conservation, waste management, travelling behavior, recycling behavior and knowledge transferring and support for environmental conservation; therefore, Four Nobel Truths should be reintroduced again into the school. However, IQ, MQ, AQ and EE are significant factors for undergraduate students to have environmental conservation behavior for global warming alleviation through public consciousness to meet sustainable development. These results are congruent to concepts proposed by Thiengkamol (2009a, 2009b, 2011e, 2011f).

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