Model of Psychological State Affecting to Global Warming Alleviation

MODÈLE DE L'ÉTAT PSYCHOLOGIQUE AFFECTANT À LA LUTTE CONTRE LE RÉCHAUFFEMENT CLIMATIQUE

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Abstract

The intention of psychologists tried to understand on human behavior, and then they had developed a large number of theories and models but they had the main focus on explanation how individual perceived and evaluated the stimulant before making decision to express his behavior. However, study on human behavior, it can't be ignored the psychological state. Psychological state is a mental condition in which the qualities of a state are relatively constant even though the state itself may be dynamic but it contains certain characteristics that might be permanent for period of life. Especially, people is inspired for value of self-living, value of family living, attitude of sufficiency, religion belief, and Environmental Physical.

The populations was 35, 010 undergraduate students of the first semester of academic year 2011 of Mahasarakham University. The simple random sampling was used to collect the sample for 450 undergraduate students with equivalent proportion according to fields of study. The questionnaire was employed as instrument for data collecting. LISREL was used for model verification.

Results illustrated that the structural model, confirmatory factors of Psychological State (STATE) were able to explain the variation of confirmatory factors of Inspiration of Public Consciousness to caused Environmental Behaviors for Global Warming Alleviation with 63.4 percents. Therefore, the equation can be written as following.

BEH = 0.38 MIND + 0.29 STATE   (1)
$(R^2 = 0.57)$

Résumé

L'intention de psychologues ont essayé de comprendre le comportement humain, et puis ils avaient développé un grand nombre de théories et de modèles, mais ils avaient l'accent principal sur la façon dont chaque explication perçu et évalué les stimulants avant la prise de décision pour exprimer son comportement. Toutefois, une étude sur le comportement humain, il ne peut pas être ignoré l'état psychologique. État psychologique est un état mental dans lequel les qualités d'un Etat sont relativement constants, même si l'État lui-même peut être dynamique, mais il contient certaines caractéristiques qui pourraient être permanente pour la période de la vie. Surtout, les gens sont inspirés pour la valeur de l'auto-vie, valeur de la vie familiale, l'attitude de suffisance, de croyance religieuse, et l'environnement physique.

Les populations était de 35, 010 étudiants de premier cycle du premier semestre de l'année académique 2011 de l'Université Mahasarakham. L'échantillonnage aléatoire simple a été utilisé pour recueillir l'échantillon de 450 étudiants de premier cycle avec une proportion équivalente selon les domaines d'étude. Le questionnaire a été utilisé comme instrument pour la collecte des données. LISREL a été utilisée pour la vérification de modèle.

Résultats montré que le modèle structurel, les facteurs de confirmation de l'état psychologique (ÉTAT) ont été en mesure d'expliquer la variation des facteurs de confirmation de l'inspiration de la conscience publique aux comportements environnementaux causés par la lutte contre le réchauffement climatique avec 63,4 pourcents. Par conséquent, l'équation peut être écrite comme suit.

BEH = = 0,38 + 0,29 ESPRIT D'ÉTAT   (1)
$(R^2 = 0,57)$

Global Warming; Affectan

INTRODUCTION

Global warming is continuous rising in the average temperature of Earth's atmosphere and oceans. This finding is recognized by the national science academies of all the major industrialized countries and is not disputed by any scientific body of national or international standing. In particular, most scientists indicate that the warming in recent decades has been caused primarily by human activities that have increased the amount of greenhouse gases in the atmosphere such as deforestation and fossil fuel combustion (United States National Academy of Sciences., 2008, National Research Council of USA., 2010, and Thiengkamol, 2011e).

The main international mitigation effort is the Kyoto Protocol, which seeks to stabilize greenhouse gas concentration to prevent a "dangerous anthropogenic interference" (UNFCCC, 2005). At international level as of May 2010, 192 states members of the UNFCCC had ratified the protocol. The only members of the UNFCCC that were asked to sign the treaty but have not yet ratified it are the USA and Afghanistan (UNFCCC, 2011).

The Tenth National Economic and Social Development Plan of Thailand (B.E. 2550-2554), it included the principle of participation of every sectors in Thai society and aimed to set Thai citizen as center of development in order to accomplish a sustainable economic and society based on the moral and ethics for living and conservation of natural resources and environment in order to develop the quality of life of Thai people in numerous aspects that was consistent to principle of sustainable development in accordance to concept of conference of environment and development of United Nation since 1992. In Agenda 21 of global action plan mentioned that "Sustainable development is development which meets the needs of the presented without compromising the ability of future generations to meet their own needs." (Office of National Economic and Social Development Plan, 2010, WCED, 1987, Volker, 2007, Watkinson, 2009, & Thiengkamol, 2011e).

The psychologists also realized that psychological state affects to human behavioral blueprint, and then they had developed a large number of theories and models but they had the main focus on explanation how individual perceived and evaluated the stimulant before making decision to express their behaviors. Nevertheless, study on human behavior, it can't be neglected the psychological state. There is much debate over how much of whom we are is by nature (genetic) or nurture (environment), and both contribute significantly to our complete expression (Kassin, 2003, Pearson, 2006, & Thiengkamol, 2011f). Nevertheless, psychological state is a mental condition in which the qualities of a state are relatively constant even though the state itself may be dynamic but it contains certain characteristics that might be permanent for period of life. Especially, people is inspired for value of self-living, value of family living, attitude of sufficiency, religion belief , and Environmental Physical.

In accordance with this perspective, psychological states are relatively stable over time, differ across individuals, and influence behavior. However, in studying of human characteristics, it revealed that both physical and biological features are the stimulants to make people express their behavior in different approaches of place, surrounding people, and experience. These are unable to overlook since the human and environment are deeply and tightly interrelated to each other, while environment play a role as stimulant to make human to perform different activities. Therefore, the human behavior was expressed by psychological state and also caused to make behavior change for environmental conservation with public consciousness (Suwan, 2006, & Thiengkamol, 2011f). The ability of understanding about behavioral occurrence or expression of human, it leads to predict and control the undesirable behaviors or promote and build the desirable behaviors. In addition, the findings revealed that psychological state in terms of value of self-living, value of family living, attitude of sufficiency, religion belief, and environmental physical were affecting through environmental consumption behavior. However, the inspiration of public mind also affected to environmental consumption behavior (Thiengkamol, 2004, Thiengkamol, 2005a, Thiengkamol, 2005b, Thiengkamol, 2010b, Thiengkamol, 2011b, Thiengkamol, 2011c, Thiengkamol, 2009a, Thiengkamol, 2009b, Thiengkamol, 2011a, & Thiengkamol, 2011e, & Thiengkamol, 2011f, & Jumrearnsan, & Thiengkamol, 2011).

Regarding to another essential factor that was neglected is inspiration to have public consciousness or public mind. Public mind or public consciousness was defined according to different perception or consideration of people, however in Thai society gave various meaning such as National Research Council of Thailand giving definition of public mind that take notice and participate in the public issues that are advantage to country with consciousness and holding the system of morality and ethics including indignity for wrong action and emphasizing on being neat, economizing, and balance between human and nature.

Accordingly, Thiengkamol mentioned on public consciousness or public mind based on inspiration from insight and inspiration different from motivation because inspiration needs no rewards. Inspiration of public

consciousness or public mind, especially, for natural resources and environment conservation, one doesn't receive any reward, admiration or complement for ones act for natural resources and environment conservation. Inspiration of public consciousness might occur due to appreciation in a person as role model or idle, impressive events, notable situations, impressive environment, media perceived such as movies, book, magazine, and internet (Thiengkamol, 2009a , Thiengkamol, 2009b , Thiengkamol, 2011a, Thiengkamol, 2011e, & Thiengkamol, 2011f).

It was obviously seen that there was no research done on environmental behavior for global warming alleviation affecting by psychological state covering value of self-living, value of family living, attitude of sufficiency, religion belief, and environmental physical through inspiration of public consciousness. Currently, it is very rarely and there is no research is holistically integrative done about psychological state when it is compared with other aspects of relating factors affecting to environmental behaviors such as knowledge, understanding, awareness and attitude.

Therefore, this research was designed to study by covering all factors relating as mentioned above, it would be able to develop a model of environmental behaviors that are affected by psychological state through inspiration of public consciousness.

OBJECTIVE

The objective was to propose the structural model of psychological state through inspiration of public consciousness affecting to environmental behavior for global warming alleviation.

METHODOLOGY

The research design was implemented in steps by step as follows:

1)   The populations were 35,010 undergraduate students of the first semester in academic year 2011 of Mahasarakham University. The 450 simple random sampling was employed to collect data from different faculties of Mahasarakham University with the equivalent proportion.

2)   The research instrument was the questionnaire and it was used for data collecting.

The content and structural validity were determined by Item Objective Congruent (IOC) by 5 experts in the aspects of environmental education, psychology, social science and social research methodology. The reliability was done by collecting the sample group from 50 undergraduate students of Rajabhat Mahasarakham University which is nearby Mahasarakham University. The reliability was determined by Cronbach's Alpha. The reliability of psychological states, and inspiration of

public consciousness, environmental behaviors, and the whole questionnaire were 0.897, 0.805, 0.829 and 0.949 respectively.

3)   The descriptive statistics used were frequency, percentage, mean and standard deviation. The inferential statistics used was LISREL by considering on Chi-Square value differs from zero with no statistical significant at .05 level or Chi-Square/df value with lesser or equal to 2, P-value with no statistical significant at .05 level and RMSEA (Root Mean Square Error Approximation) value with lesser than 0.05 including index level of model congruent value, GFI (Goodness of Fit Index) and index level of model congruent value, AGFI (Adjust Goodness of Fit Index) between 0.9-1.00.
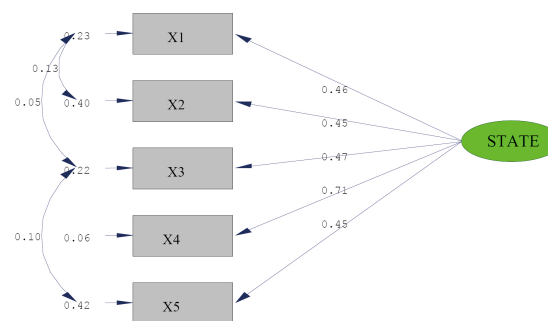
RESULTS

Confirmatory Factors of Exogenous Variables

Results of Confirmatory Factor Analysis of Exogenous Variables of Psychological State affecting to environmental behaviors for global warming alleviation, were revealed as followings.

Confirmatory Factor Analysis of Psychological State (STATE)

Confirmatory factors of State had Bartlett's test of Sphericity of 751.823 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.769. This indicated that components of STATE aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 1 and table 1.

Chi-Square=0.236, df=2, P-value=0.75428, RMSEA=0.001

Picture 1
Model of Confirmatory Factors of Psychological State

Table 1
Results of Analysis of Confirmatory Factors of Psychological State

Confirmatory factors of Psychological State	Weight	SE	t	R_2
X1 Value of Self-Living	0.46	0.028	12.02**	0.39
X2 Value of Family Living	0.45	0.035	11.56**	0.47
X3 Attitude of Sufficiency	0.47	0.037	15.58**	0.49
X4 Religion Belief	0.71	0.038	17.96**	0.88
X5 Environmental Physical	0.45	0.039	11.01**	0.46

Chi-Square=0.236, df=2, P-value=0.75428
GFI = 1.00   AGFI = 1.00
RMSEA = 0.001 RMR = .012

** Statistically significant level of .01

From picture 1 and table 1, results of analysis of confirmatory factors of STATE from 5 observe variables were revealed that the model was congruent to empirical data by considering from 1) Goodness of Fit Index (GFI) equaled to 1.00 and Adjust Goodness of Fit Index (AGFI) equaled to 1.00 2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.001 (RMSEA< 0.05) and 3) Chi- Square value had no statistically significant at level of .01 and degree of freedom was lesser than or equaled to .05 ($x^2/df \leq 5.00$).

Considering on loading weight of observe variables in model, it was revealed that observe variables had loading weight with 0.45 to 0.71 and had covariate to model of Psychological State with 39.0 to 88.0 percents.

Confirmatory Factor Analysis of Endogenous Variables

Results of Confirmatory Factor Analysis of Endogenous Variables of Inspiration of Public Consciousness influencing to environmental behaviors for global warming alleviation, was revealed as followings.

Confirmatory Factor Analysis of Endogenous Variables of Inspiration of Public Consciousness (MIND)
Confirmatory Factor of Inspiration of Public

Consciousness (MIND) had Bartlett's test of Sphericity of 579.995 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.658. This indicated that components of EE aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 2 and table 2.
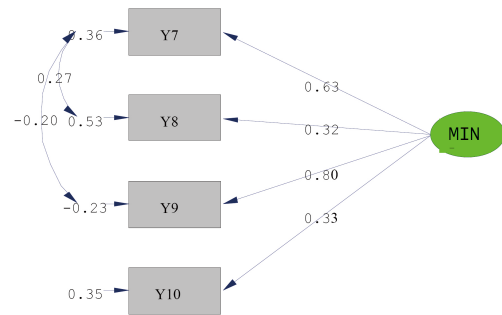
Chi-Square=0.123, df=1, P-value=0.9990, RMSEA=0.001

Picture 2
Model of Confirmatory Factor of Inspiration of Public Consciousness

Table 2
Results of Analysis of Confirmatory Factors of Inspiration of Public Consciousness

Confirmatory factors of Inspiration of Public Consciousness	Weight	SE	t	R_2
Y7 Person as Role Model	0.63	0.069	8.41**	0.52
Y8 Impressive Event	0.32	0.045	6.04**	0.14
Y9 Impressive Environment	0.80	0.088	8.72**	0.99
Y10 Public Mind Performance	0.33	0.046	6.98**	0.23

Chi-square = 0.123 df = 1 P = 0.9990
GFI = 1.00 AGFI = 1.00 RMSEA = 0.0001 RMR = .0001

** Statistically significant level of .01

From picture 2 and table 2, results of analysis of confirmatory factors of MIND from 4 observe variables was revealed that the model was congruent to empirical data by considering from 1) Goodness of Fit Index (GFI) equaled to 1.00 and Adjust Goodness of Fit Index (AGFI) equaled to 1.00 2) Root Mean Square Error of

Approximation (RMSEA) equaled to 0.000 (RMSEA< 0.05) and 3) Chi- Square value had no statistically significant at level of .01 and degree of freedom was lesser than or equaled to .05 and $x^2/df \leq 5.00$.

Considering on loading weight of observe variables in model, it was revealed that observe variables had loading

weight with 0.32 to 0.80 and had covariate to model of Inspiration of Public Consciousness with 14.0 to 99.8 percents.

Confirmatory Factor Analysis of Endogenous Variables of Environmental Behaviors for Global Warming Alleviation (BEH)

Confirmatory Factor of Environmental Behaviors for Global Warming Alleviation (BEH) had Bartlett's test of Sphericity of 834.235 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA of 0.832. This indicated that components of BEH aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 3 and table 3.
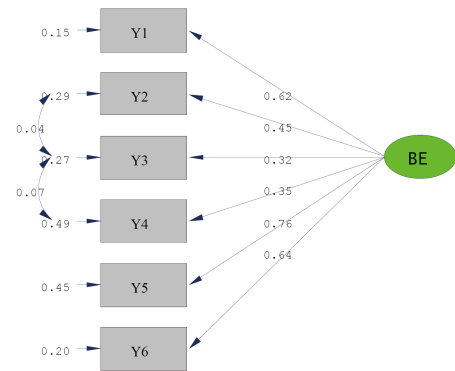
Chi-Square=11.55, df=7, P-value=0.15482, RMSEA=0.0355

Picture 3
Model of Confirmatory factors of Environmental Behaviors for Global Warming Alleviation (BEH)

Table 3
Results of Analysis of Confirmatory Factors of Environmental Behaviors for Global Warming Alleviation

Confirmatory factors of Environmental Behaviors for Global Warming Alleviation		Weight	SE	t	R_2
Y1	Consumption Behavior	0.62	0.029	20.65**	0.70
Y2	Energy Conservation	0.45	0.031	12.99**	0.35
Y3	Waste Management	0.32	0.029	9.45**	0.19
Y4	Travelling Behavior	0.35	0.039	10.56**	0.22
Y5	Recycling Behavior	0.76	0.045	17.47**	0.66
Y6	Knowledge Transferring and Supporting for Environmental Conservation	0.64	0.030	19.89**	0.64

Chi-square = 11.55 df = 7 P = 0.15482
GFI = 1.00 AGFI = 0.99 RMSEA = 0.000 RMR = 0.0355

** Statistically significant level of .01

From picture 3 and table 3, results of analysis of confirmatory factors of BEH from 6 observe variables were revealed that the model was congruent to empirical data by considering from 1) Goodness of Fit Index (GFI) equaled to 1.00 and Adjust Goodness of Fit Index (AGFI) equaled to 0.99 2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.000 (RMSEA< 0.05) and 3) Chi- Square value had no statistically significant at level of .01 and degree of freedom was lesser than or equaled to .05. $x^2/df \leq 5.00$.

Considering on loading weight of observe variables in model, it was revealed that observe variables had loading weight with 0.32 to 0.76 and had covariate to model of Inspiration of Public Consciousness with 22.0 to 70.0 percents.

Results of Effect Among Variables in Model in Terms of Direct Effect

Confirmatory factors of Psychological State (STATE) had direct effect to Inspiration of Public Consciousness (MIND) and Environmental Behaviors for Global Warming Alleviation (BEH) with statistically significant at level of .01 with effect of 0.69 and 0.38. Additionally, confirmatory factors of Psychological State (STATE) had indirect effect to Environmental Behaviors for Global Warming Alleviation (BEH) with statistically significant at level of .01 with 24.
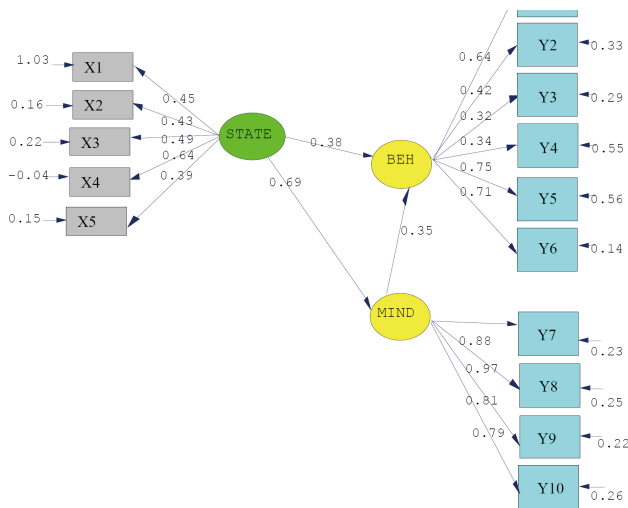
Confirmatory factors of Inspiration of Public Consciousness (MIND) had direct effect to and Environmental Behaviors for Global Warming Alleviation (BEH) with statistically significant at level of .01 with effect of 0.35.

Considering on structural model, exogenous factors of psychological state factors was able to explain the variation of endogenous factors of Inspiration of Public Consciousness (MIND) to caused Environmental Behaviors for Global Warming Alleviation (BEH). Consequently, the equation can be written as equation 1.

$$BEH = 0.35 \, MIND + 0.38 \, STATE \qquad (1)$$
$$(R^2 = 0.57)$$

Equation (1) factors that had the most effect to Environmental Behaviors for Global Warming Alleviation (BEH) was Psychological State (STATE) and subsequences was Inspiration of Public Consciousness (MIND) and these were able to explained the variation of Environmental Behaviors for Global Warming Alleviation (BEH) with 57.0 percents.

Chi-Square=137.98, df=126, P-value=0.350, RMSEA=0.0346

Picture 4
Model of Direct and Indirect Effect of STATE Through MIND Affecting to BEH

DISCUSSION

The results discovered that exogenous factor of Psychological State (STATE) was able to explain the variation of endogenous factors of Inspiration of Public Consciousness (MIND) to caused Environmental Behaviors for Global Warming Alleviation (BEH) with 57.0 percents. The model of STATE through MIND affecting to BEH was verified the proposed model was fitted with all observe variables according to criteria of Chi-Square value differs from zero with no statistical significant at .05 level or Chi-Square/df value with lesser or equal to 2, P-value with no statistical significant at .05 level and RMSEA (Root Mean Square Error Approximation) value with lesser than 0.05 including index level of model congruent value, GFI (Goodness of Fit Index) and index level of model congruent value, AGFI (Adjust Goodness of Fit Index) between 0.90-1.00.

Moreover, the findings also indicated that Psychological State (STATE) had direct affecting to inspiration of public consciousness and environmental consumption behavior for global warming alleviation with highly with statistically significant at level of .01 with effect of 0.69 and 0.38. Moreover, when considering on weight of loading of observe variables of Value of Self-Living (X1), Value of Family Living (X2), Attitude of Sufficiency (X3), Religion Belief (X4), and Environmental Physical (X5) was congruent to study of Jumrearnsan, & Thiengkamol, (2011) that the results illustrated that psychological state in terms of value of self-living, family living, attitude of sufficiency, religion

belief and environmental physical illustrated the highest directly affected to inspiration of public consciousness and environmental behaviors in term of consumption behavior.

It might be concluded that psychological state play very essential functions to affect through inspiration of public consciousness to create the environmental behavior of consumption behavior, energy conservation, waste management, travelling behavior, recycling behavior, and knowledge transferring and supporting for environmental conservation. Additionally, inspiration of public consciousness in aspects of person as role model, impressive event, impressive environment, and public mind performance should be paid attentions, particularly, in aspect of role model, the parents and teacher or even though movie stars or political men should act as role model and express their public consciousness to inspire their children, students, and young generations. The results of this study were congruent to various studies of Thiengkamol, (2004, 2005a, 2005b, 2010b, 2011b, & 2011c) and the concept proposed by Thiengkamol, N., (2009a, 2009b, 2011e, & 2011f). Nevertheless, the inspiration of public consciousness and psychological state are rarely researched at present.

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