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PATH ANALYSIS IN COVARIANCE-BASED STRUCTURAL EQUATION MODELING WITH AMOS 18.0

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ABSTRACT

Path analysis in structural equation modeling has been discussed in numerous articles by renowned researchers and scholars. Specifically, the proposed method is absolutely power to intensify the statistical analysis besides obey all the regression assumption suggested. In this case study, the author use five variables to determine the level of participation of youth towards volunteers activities. All of these variables are based on the previous empirical research and of course there are more other variables but this study interest to test the primary factors on this particular research. In this work paper, three mediators namely benefits, barrier and challenge are consider as indirect effect. The findings reveals the direct effect of goverment support on barrier, benefits, challenge and motivation are significant relationship. One of the indirect effect namely benefits has a significant impact on motivation. Based on the findings suggested, the benefits factor is the most crucial to give an immense impact on motivation.

Keywords: Structural Equation Modeling, Direct Effect, Indirect Effect, Path Analysis, Volunteers

1.0 INTRODUCTION

Structural equation modeling undoubtedly for the performance of this method has been recreation for researchers and scholars to assess their findings from various areas. One of the famous structural equation modeling can be known as covariance based structural equation model that has been performed in countless software. In reality, every limitation of these method will be overcome by other newly method in order to provide a better understanding the purpose of the case study. Structural equation modeling is the permutation of exploratory factor analysis and regression analysis (Wikipedia). Previously, most of the researchers often deal a compute mean for each items that reflected for each factors to assess their findings. In generals, there are violate the regression assumption whereby the mean should be equal to zero. Consequently, the structural equation modeling is born to generalize the limitation of older version besides provide a graphical modeling to assess the scholars make an intense analysis. In this case, these papers produce a simulation of modeling using AMOS whereby to capture an attention of readers towards the compensation of this software.

In order to accomplish the primary objective research, a research subject specifically volunteerism will be tested to carry on the mention analysis. These variables obtained are the major causes that bring a tremendous impact on the perspective of the level of youth towards volunteer activity. In particular, the research paper propose five variables namely government support, barrier, benefits, challenge and motivation to be put into practice of path analysis in structural equation modeling. In the nature of social science in Malaysia, the notion of community in tackling this issues is dissatisfied though everyone already knew the significant and magnitude of volunteerism. The research question is what is the most factor that can give an impact cause and to what extent the role of these factors on the perspective of youth towards volunteerism in Malaysia. All of these questions will be answer once testing the path analysis with Amos 18.0.

Of showing interested to figure out the causal effect of each exogenous and endogenous variable, the Confirmatory Factor Analysis (CFA) should be performed at the very beginning analysis in order to examine to what extent of consent existing of each indicators that will be reflected from inside of measurement model. In particular, the outcomes that appear in the measurement model are the measure captured in variables. Nevertheless, each of the measurement models should be evaluate via proposing of index values. One question will be prudent for some of scholar that argues with the necessary of index value. As aforementioned, all of measurement model should be reliable and valid upon on the use of structural equation modeling. For an example, all of the things of world need the measurement to measure the strength of application used such as or body should be measured by thermometer to determine the temperature of heat, the ruler is preferred to measure the length, the speed of runner is rely on stopwatch and anything that need the measurement tools. Hence, that also happens in our multivariate analysis to determine the validity of our proposed model in which Confirmatory Factor Analysis is deemed as tools to validate the variables consisted. Unfortunately, the Confirmatory Factor Analysis (CFA) will not be executing in this paper since our prior objectives to aim the causal effect of exogenous and endogenous variable coincide of the entitle on the front page. Of stating the significant of CFA, the structural model should be managed on the subsequent analysis and of course match our issues addressed that has been stipulated among well-known researchers. Thus, the proposed method is very fitting to equip all the needs of objective research in this work paper. Now, the author illuminates the reason of five variables selected in order to keep away from an ambiguity of explanation the prior of these variables.

2.0 LITERATURE REVIEW

The first part is pertaining to Motivation variable that will be keep as endogenous (dependent) variable in structural model. In the accordance of Rhyne (1995), motivation is defined as a role to influence the people in circumstances to be their rival. In addition, he has established 12 top reason that represent of motivation which is in descending order of importance, include: the opportunity to help others; contributing to a valuable area; having fun; promoting and maintaining sports and recreation programs and services; contributing in an area where the family (or self) are active participants; contributing to the community; using skills; learning new skills; and also companionship and friendship. Thus, this variable is affordable to be endogenous variable to measure the level of participation of youth towards volunteerism program.

The second part is pertaining to Benefits variable that will be keeps as exogenous (independent) variable in structural model. In the accordance of Dingle (2001), there are two importance results that should be achieved 1. It helps to create a stable and cohesive society. By bringing people together to act for the good of the community, voluntary action creates bonds of trust and encourages cooperation. It creates social capital. Deardorff's Glossary of International Economics (2001:256), defines social capital as the networks relationship among persons and institutions in a society, together with associated norms of behavior trust, cooperation, and something else that enable a society to function effectively. People who are powerless as individuals can get thing done if they volunteer together as a community: unemployed people who set up self-help group to find paid work.2. It adds values to the services that government provides. Many of the tasks that volunteers undertake voluntarily – such as giving advice, looking children, caring for the sick- are valuable supplements to the services that governments provide. In the context of this study, home based carriers are the valuable supplements in the care and support of the HIV/AIDS patients, especially when hospitals and other health care institutions are battling to cope with the rapid influx of patients-either because of a lack of personnel, funds, or infrastructure.

The third part is pertaining to Barrier variable that will be keeps as exogenous (independent) variable in structural model. Marlene Wilson, (1976) and Eva Schindler- Rainman, (1987) explores the barrier is the early mainstream (example: not about supported volunteering specifically) volunteer program management literature contains encouraging messages about broadening the base of volunteering. In generals, this factor can be main research problem of people from getting involved in volunteerism program due to the scenario that they will face. Hence, the number whose involve in these activity will become decrease.

The fourth part is pertaining to Challenge variable that will be keeps as exogenous (independent) variable in structural model. According to Dingle, (2001) describe three factors that challenges volunteering which can be indirectly among people to involve the volunteerism program. These are: globalization, relations with the state, and the relation with the market.

The fifth part is pertaining to Government Support variable that will be keeps as exogenous (independent) variable in structural model. According to Dingle (2001), volunteering is affected according to cultures and traditions, and more specifically, according to the socioeconomic and political climate of a country. Volunteering is a product of its environment and a governmental plan for promoting volunteering in Southern Africa, or Latin America, may not be appropriate for Western Europe or North America. Government support for volunteering may take several forms.

All of these variables selected will be drawn to test the causal effect between exogenous and endogenous constructs. Specifically, three out of five variables will be tested as mediator variable. Mediator variable is performed once the scholars find out the double role of these factors. In this case, three of mediator variable appear for volunteer activity as a research subject regarding the previous empirical research. However, the mediator variable as well as can be shown when the scholars expect that factors can be performed in

structural equation modeling. In order to prove the existing of mediator variable in this work paper, Table 1 present the reason of these variables to be mediator mode.

Mediator variable probably can be exogenous and endogenous at the same time in multivariate analysis. This case study has been suggested to provide better an understanding on the explanation of these variables. Besides, mediator can let the scholar to determine to what extent of level efficiency and sufficiency of the variable includes in a path model. The study is much interesting if scholar wise in drawing of conclusion and contribution of the research paper.

Author/ Years	**Statements**	**Variable**
Dingle, 2001	Goverments may contribute by supporting such infrastructure. Further, if goverments is better informed about the people who volunteeer, it is likely to become more aware of how policy legislation it introduces can affect, both directly and indirectly , people giving of their time	**Benefits**
Dingle, 2001	describe three factors that challenges volunteering which can be indirectly among people to involve the volunteerism program . These are : globalization, relations with the state, and the relation with the market	**Challenges**
Marlene wilson, 1976 and Eva Schindler- Rainman, 1987	. In generals, this factor can be main research problem of people from getting involve in volunteerism program due to the scenario that they will faced. . Hence, the number whose involve in these activity will become decrease	**Barrier**

Table 1

3.0 MEASUREMENT INSTRUMENTS

In this paper provided for five constructs namely motivation, government support, challenge, barrier and benefits that have been validated using the past previous literature. These variables once to outline the level of involvement in volunteerism program among youth but now the author intend to address the HCMs in PLS-SEM using these variables as a research subject. The questionnaire has been distributed to five higher educations chosen using stratified sampling technique and involving 453 respondents. Generally, questionnaire designed a total of 53 items in each difference variables so that the respondent know the aimed of question given. The likert scale used is from 1 through 5 (1- strongly disagree. 2- disagree, 3- undecided, 4- agree, 5- strongly agree). As usual, the researchers should ensure all the items loading in data set has been standardized (mean = 0, standard deviation =1). If not, the result obtained in confirmatory factor analysis consists of negative value. Means that, the item consists of factor loading do not have the same direction on endogenous variables.

4.0 FINDINGS

Once the researchers have addressed the issue of unidimensionality, validity, and reliability of the latent construct in the study, on the subsequent step is to provide model these particular constructs into a structural model for analysis using SEM. The normal practice is to assemble the construct from left to the right. The arrow to link the constructs is determined by the direction of hypotheses. The single headed arrow is used to test the causal effect or direct effect, while double headed arrow is used to test the correlational effects among constructs. In SEM, the reseracher could model and analyze the multiple relationships among the constructs simultaneously (Zainudin Awang, 2013).

Suppose the study has one independent construct, three mediators, and one dependent construct in the model. All five constructs are latent and they are measured through a set of items in a questionnaire. This SEM can be known as the covariace-based structural equation modeling (CB-SEM) which performs estimator of full maximum likelihood. In theoretically, maximum likelihood has two types which full maximum likelihood and restricted maximum likelihood. Normally, researchers commonly use full maximum likelihood since this estimator includes the fixed variable.

First and foremost, the researcher needs to run the CFA for the measurement model of the respective constructs. The CFA would assess the three requirements for modeling SEM namely unidimensionality, reliability and validity. The CFA procedure for measurement model has been achieved earlier before conducting the structural model. Structural model is an assembled of all measurement models that achieve all the required level in order to improve the fitness of model. Specifically, all the latent construct should be apply based on their case study once we had equip the requirement to be possible aside to keeping the substantive theory.

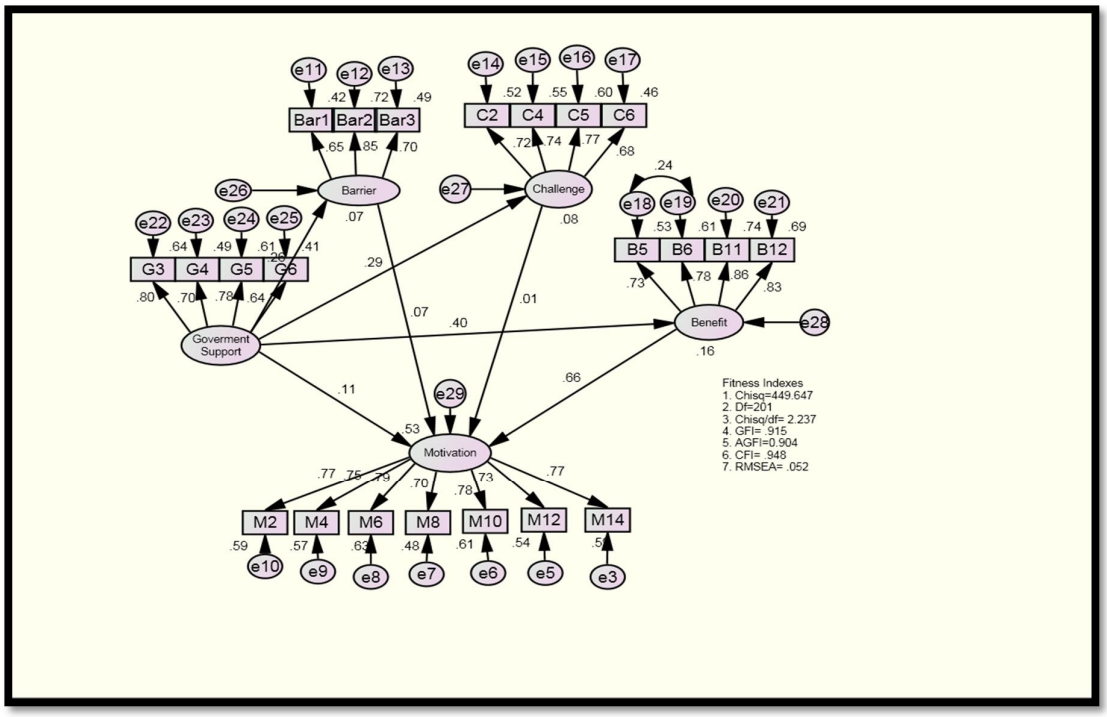

Figure 1

This is the model for standardized estimates. The standardized estimate shows the measure of correlation between exogenous and endogenous variables. All the fitness indexes achieve the required level. In doing so, the factor loading for each constructs would be appear, in particular, factor loadings is reflected of the capture in observed heterogeneity of variables. Some of the renowned researchers prone to emphasize on this behaviour estimation to compare the selected group such as gender, education, salary and others once cope to implement the multigroup analysis or multigroup confirmatory factor analysis (observed heterogeneity).

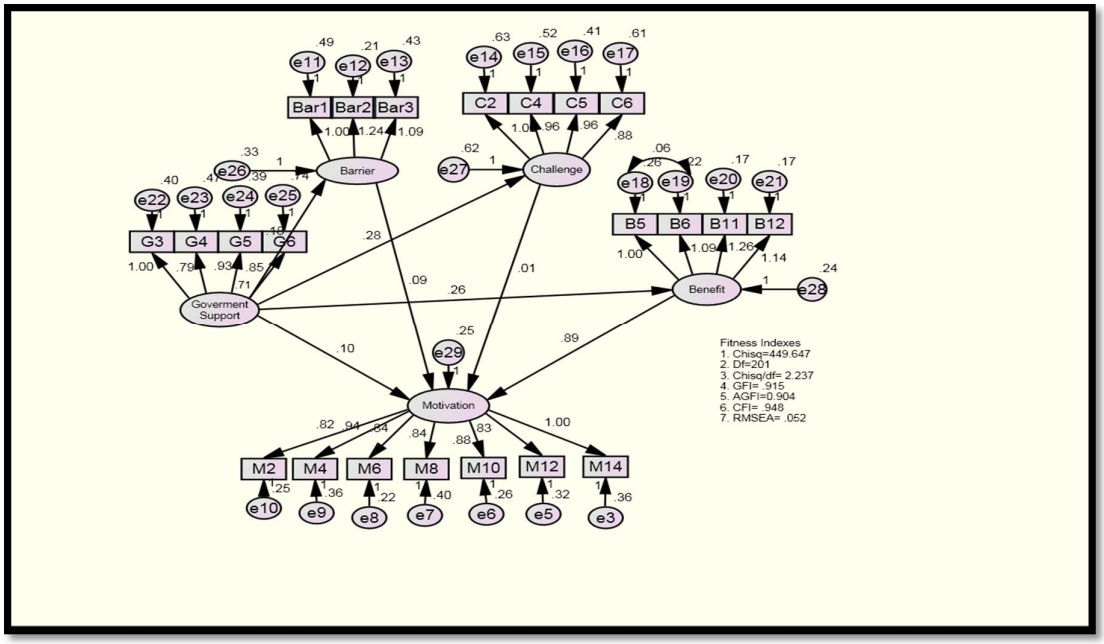

Figure 2

The diagram shows the structural model with factor loadings and fitness indexes. By regarding on the parsimonious fit (chi-square/df), the value is less than 5.0. Hence, this structural model is acceptable. However, the supplementary fit which is absolute fit and incremental fit is performed in order to get the best mesurement model. The absolute fit and incremental fit can be referred on the baseline comparison and Root Mean Square Approximation (RMSEA). Of the specify and setup the pattern of a path model, the findings should be provided once execute the calculation in SEM using maximum likelihood estimator. In such things, most of the researchers concur to label on particular estimator to be the best one to assess the findings. Previously, this paper had outlined seven research hypotheses that will be address in the modeling of the mediation using SEM. The finding is presented as the Table 2.

Hypothesis Statement of Path Analysis	**Estimate**	**P-Value**	**Result**
H_1: Goverment support influence on barrier	.182	***	**Supported**
H_1: Goverment support influence on challenge	.279	***	**Supported**
H_1: Goverment support influence on benefits	.255	***	**Supported**
H_1: Goverment support influence on motivation	.099	.024	**Supported**
H_1: Barrier influence on motivation	.085	.115	**Not Supported**
H_1: Challenge influence on motivation	.013	.735	**Not Supported**
H_1: Benefits influence on motivation	.890	***	**Supported**

Table 2

Table 2 present the findings of whole latent construct. The first part is to determine our research hypothesis is accepted or rejected. The probability value (p-value) whereby lower than 0.05 will be considered significant.In particular, the findings suggest to reject the null hypothesis and accept the hypothesis I. In this case, five out of seven research hypothesis are significant since below than 0.05. The author use the term of "Supported" to classify that research hypothesis is significant. Addressed to the direct effect constructs, the goverment support has a significant impact on barrier, benefit, challenge and motivation. By inspecting through for all direct effect or causal path, challenge factor is the highest estimation that may bring a tremendous effect due to the existing of goverment support. In doing so, the researchers could be focus to that issue for changing the influence of youth towards volunteer activities. Of we emphasize on that issue, we pursue to predict the indirect effect of barrier, benefits and challenges on motivation. Once again, these three mediators are to be chosen based on previous empirical research. So, that's no doubt we implement three mediators in path analysis using covariance-based structural equation modeling. Apparently, one of these three mediators is appear to be significant path whereby benefits is influece on motivation. In doing the same thing to the indirect effect, benefits factor is the most importance to bring abundance effect on the perception of youth towards volunteer activity. Thus, one can be concludes that the challenge is important for direct effect whereas benefits is important for indirect effect in path analysis.

Overall, the findings suggest the benefits factor is the best factor to be a major cause to give an impact on motivation. Some of the researchers may interest to outline the strength of mediator variable when encounter more than one mediator variable. If so, they might apply Cohen (1988) tehnique to isolate to what extent the importance of mediator variable once we implement in path analysis. In this case, this paper prone to determine the causal effect of exogenous and endogenous variables. Hence, the case study is limited on the path analysis and should be forward to drawing the conclusion and of course the recommendation is encouraged apply to enhance the limitation of case study.

5.0 CONCLUSION AND RECOMMENDATION

Conclusion is the summarized for whole subtopic that has been discovered by scholars aside emphasized the findings of research paper. In this instances, this paper straight wards to specify the purpose of path analysis in structural equation modeling with AMOS. In endeavor to setup the modeling, all scholars should apply their confirmatory factor analysis to validate the indicators of measurement model whether reflective or formative perspective. Afterwards, path analysis can be applied once have achieved all the required level in confirmatory factor analysis. In this case, this paper intend to use three mediators variables to indicate the causal path of these respective constructs on corresponding variable based on previous empirical research. The findings suggest challenge factor is the major cause to bring tremendous impact for direct effect. Unfortunately, the strength of challenge factor is totally transformed when fleet into indirect effect. Of indirect effect, the benefits factor is a major cause to provide an immense impact on motivation. The entire findings presented the benefits factor is the most importance linked to other four factors.

This case study is not so widely since implementation of five variables is not enough to examine the level of participation of youth towards volunteer activities. The study is much better if analyze more variables. So, this can be performed well if the work paper adds some variables related. Rather than address on the path analysis, the statistical power analysis should be carry on so that the readers know how well the contribution and strength of mediator variables of case study. Besides, the knowledge importance variable is should be advance to the performance of variables. In the future research, this paper prone to apply importance-performance matrix analysis whereby is the advance structural equation modeling. Thus, the scholars managed to draw a good interpretation on the case study provided.

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