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Development and validity testing of belief measurement model in Buddhism for junior high school students at Chiang Rai Buddhist Scripture School: An application for Multitrait-Multimethod analysis

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The purposes of this study were to develop a model to measure the belief in Buddhism of junior high school students at Chiang Rai Buddhist Scripture School, and to determine construct validity of the model for measuring the belief in Buddhism by using Multitrait-Multimethod analysis. The samples were 590 junior high school students at Buddhist Scripture School who selected using the multi-stage random sampling. Three-Choice Situational Buddhist Belief Test (Sbbd) and Five-Scale Buddhist Belief Test (Rbbd) were used for data collection. Data were analyzed by descriptive statistics, CFA, and MTMM. The findings showed that 1) the results of the second order confirmatory factor analysis for measuring the belief in Buddhism were correlated with the empirical data at a good level (Sbbd: χ^2/df = 1.141, p-value = 0.146 and Rbbd: χ^2/df = 1.071, p-value = 0.287), and 2) multitrait-multimethod analysis had construct validity at a good level (χ^2= 33.664, df = 26, p-value = 0.144, CFI = 0.999, TLI= 0.998, RMSEA = 0.022, SRMR = 0.032, χ^2/df = 1.294). Both types of tests used for measuring the belief in Buddhism had convergent validity at a high level, discriminative validity at a moderate level, and reliability at a high level.

Key words: Belief in Buddhism, construct validity, second order confirmatory factor analysis, multitrait-multimethod analysis.

INTRODUCTION

The Belief in Buddhism has been a factor significantly influencing the peace of the society. In other words, Buddhism has been associated with the life of the people for a long time. Although the society has been greatly

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developed in recent years, Buddhism still has an influence on the peace of the society (Glock, 1973). At individual level, Buddhism teaches people to love peace by developing their mental strength, viewing the world based on cause and effect, treating others with kindness, and being a mental refuge in order to face sufferings in life with courage, and these teachings lead to a peaceful life. At organizational level, Buddhism has laid concept foundation, good ideology, and control of people to behave according to the norms of society in order to build the unity to be able to live together in peace (Dowling, 2006; Hirota, 2004). When people have a strong belief in Buddhism, they will behave according to the teachings strictly. As a result, the belief in Buddhism is, in indeed, a factor that has an effect on peace in the society (Bronkhorst, 2000).

Measuring the belief in Buddhism is a study on the scope of the behavioral sciences since measuring on such belief is related to ideas and individual behavior (Pargarment, 1995; Fukuyama, 1961). The results of previous studies indicated that measuring religious belief faces a lack of external validity. This is mainly because religious belief is a behavioral variable that has a wide scope, and easy to result in measurement errors due to a combination of several latent variables making the composition and behavioral indicators unclear. In the past, researchers measured several components by using only one method of measurement—rating scale (Hadaway and Penny, 2005). Although this research instrument is convenient and economical to collect the data, it is easy to be biased, and may not be appropriate for some features or indicators of certain elements. Measurement tools created are relatively specific since the research directions aim at specific groups. As a result, they cannot be used in conjunction with those of other groups, which have different qualifications, seniority or social contexts. Most importantly, the development of previous measurement tools for measuring a religious belief relied merely on examining content validity, and therefore cannot ensure whether the measurement results were fully met with the characteristic components of the religious belief (Siobhan and Voas, 2011; Dowling, 2006). This challenges many researchers to solve such problems by using the techniques of advanced statistical analyses to analyze the development results and test the validity of wide-scoped behavioral variable measurement tools (Jacobs and Roodenburg, 2014; Simsek et al., 2012; Mitte and Kampfe, 2008)

In order to develop the behavioral sciences measurement tools to meet standard, measurement validity is a factor that has a direct variation with other qualities of measurement tools. Consequently, validity quality is important for research measurement tools (Fraenkel and Wallen, 2006). To obtain the instruments developed for measuring wide-scope behavioral sciences variables, researchers can determine it through statistical analysis in two ways. First, a confirmatory factor analysis (CFA) which is a technique that can provide evidence of measuring variables in behavioral sciences with various elements that are fully conformed to the theory or are appropriate with the samples by considering consistency of the empirical data (Sunthud et al., 2014; Marsh et al., 2013). In addition, the importance of the elements and indicators developed can also be confirmed through the weight of the components (Hull and Beaujean, 2011). Second, Multitrait-Multimethod Analysis (MTMM) is a technique for analyzing various matrix features and ways to measure through confirmatory factor analysis, which is a measurement that provides precise analytical results. This shows if the instruments can be measured according to the traits or not. It can also indicate if the variance of scores is a result of the measuring instrument or traits, by considering convergent validity. The results can also indicate if each feature can respond or suit the type of measurement regarding the comparison of the weight of elements. Moreover, this can also indicate which measurement can better classify the traits in each category by considering the discriminant validity and R^2 value to consider the reliability of the traits. It can be seen that MTMM analysis is a statistical method that could solve the problem in the past; it could fully measure wide-scope behavioral sciences variables with the highest efficiency (Christian et al., 2015; Byrne, 2012; Brian and Frederick, 2007).

Therefore, developing and testing the accuracy of the model to measure the belief in Buddhism by applying MTMM analysis should be concretely investigated in order to provide information for the development and promotion of the religious faith of the people in the society, and for the peace of the society in the future, especially for junior high school students at Buddhist Scripture School who would become leaders of Buddhist community in the future.

Objectives

Regarding the review of related literature, the purposes of this study are to

1) develop a model to measure junior high school students at Buddhist Scripture School, Chiang Rai province, belief in Buddhism since the elements and indicators of related literature are mostly specific.
2) to determine a constructive validity of the model for measuring the belief in Buddhism of junior high school students at Buddhist Scripture School in Chiang Rai province by using MTMM analysis.

Hypothesis

1) Model to Validation of belief to Buddhism

Measurement Model is in the harmony with of non-statistical significance of fit indices.
2) Model to Validation of belief to Buddhism Measurement Model of the construct validity by the convergent validity in weight coefficients the composition features. The higher the coefficient of weight composition measurement and discriminant validity in the correlation coefficient between the feature and correlation is low.

MATERIALS AND METHODS

Belief in Buddhism

Belief in Buddhism refers to the confidence of the people towards the Triple Gem, and the Law of Karma. As a result, people behave based on their belief such as performing good deeds, keeping the precepts, and practicing mindfulness meditation (Dowling, 2006). The Buddhist belief of the people in the society can be explained by the theory of the religiosity of Glock (1973), which explains the five factors that make humans religious: 1) intention to provide themselves with a better life, 2) the ideological steadfastness towards religion, 3) joining religious ceremonies, 4) receiving religious information, and 5) having values as a result of the above reasons. In addition, the increasing level of faith in Buddhism of the society, according to Hirota (2004), describes the causal relationship of the increasing level of Buddhist faith in four reasons: 1) adherence (satisfaction in look, praise, way of life, and consistency with the original concept); 2) receiving religious information; 3) consideration with wisdom; and 4) trials to prove these religious teachings. These mechanisms result in societal belief in Buddhism.

The survey findings of previous research on religious faith showed a variety of measuring elements both of the differences and similarities. For example, Hayes and Pittelkow (1993) measured the religious belief of 500 elderly Australian Christians on five elements. This includes the belief in God, life after death, devil, hell, and heaven using a rating scale. Meanwhile Hadaway and Penny (2005) measured the public's faith in Christianity in the United States on three elements—the belief in God, church and charity using a rating scale. Also, Siobhan and Voas (2011) measured the public's faith in Christianity of 1,600 people in England and Wales on three elements: the belief in God, life after death, and practices according to the teachings, using a five-point rating scale. It can be concluded that a measurement of faith in religion is a study of the uniqueness of each religion. It is the measurement on the dimension of faith, and practice on the principles of the religion. As a result, the elements of the study has no clarity on measuring elements since the religious belief is a wide-scope behavioral science variable. However, the synthesis results of previous Buddhist research can summarize the elements of measuring the belief in Buddhism into six components for conducting the research framework: the concept of confidence in the triple gem; the concept of Buddhist karma; adherence to Buddhist concepts/precepts; training to avoid passions; commitment on training mindfulness; and perseverance in the pursuit of knowledge.

All these findings revealed that previous research had not examined the quality of the research measurement tools in terms of construct validity which was especially important for measuring wide-scope behaviors. This made it impossible to know if measuring results fully met the traits required. Furthermore, the religious belief contains many features, and each feature is relatively different. However, previous research used only one form of measurement rating scale. Although this form of measurement is convenient, economical, can collect large data, uses fewer data collectors, and the respondents are free to choose the answer, the measurement tool could be biased and may not be suitable for the traits of certain elements. If we add a situational measurement tool that has better ability to prevent biased answers from the respondents, this will result in a suitable measurement tool that can fit certain features. Consequently, if there is a review of the traits and behavior indicators regarding the belief in Buddhism in terms of measurement model, it will provide clarity, a variety of instruments to measure the Buddhist faith in a more tangible way, and serve as information for related personnel to use with policy planning. This will help to promote people's belief in Buddhism.

Multitrait-multimethod analysis (MTMM)

The findings of previous studies showed that many researchers attempted to solve validity problems of wide-scope behavioral science variables measuring results, and different latent variables by using advanced statistic techniques to analyze the development and validity testing of MTMM measurement tools (Jacobs and Roodenburg, 2014; Simsek et al., 2012; Mitte and Kampfe, 2008).

The confirmatory factor analysis technique for MTMM analysis is a way to test the construct validity of the invention in order to eliminate problems or limitations of traditional analysis of correlation. This is done by using confirmatory factor analysis to determine the results of the traits and elements of measuring methods to test the model in order to know how important it is for theoretical elements. In other words, it is a way to test construct validity by analyzing linear structure relationship for testing the characteristic variability and measuring methods or other unique traits aimed while studying. The analysis of MTMM can be divided into three parts: 1) to ensure the consistency between the measurement model and eight empirical data, statistical values, chi-square (χ^2), degree of freedom (df), statistical significance (p-value), comparative fit index (CFI), Tucker Lewis index (TLI), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and relative chi-square (χ^2/df) which provides information for determining the validity, clarity, and appropriateness between the measurement model and theories or traits (Steiger, 2007); 2) to verify convergent validity from the comparison between the weight of the elements (β) on traits and the measurement method. This indicates that the variability of the measurement scores obtained determines the result of the traits or the methods used to measure; and 3) to determine discriminant validity by comparing the matrix correlation coefficients and traits measured by the similar pattern. Regarding both considerations on validity, they provide the information on how to select appropriate and effective measurement for each component feature and individual components. In addition, MTMM analysis shows R^2 value of each element which is the reliability of the measurement traits (Christian et al., 2015; Byrne, 2012; Nussbeck et al., 2009; Brian and Frederick, 2007; Millsap, 1995).

The findings of previous studies shows that MTMM analysis is a wide-scope behavioral science validity testing which provides a detailed, precise, and effective analysis results. For example, Anthea et al. (2004) applied MTMM analysis to develop and test the model of optimistic attitude measuring instruments. It was found that MTMM analysis provides the information that shows validity of measurement tools, as well as the appropriateness of measurement tool model towards the traits, and this study is consistent with Simsek et al. (2012) who used MTMM analysis to test the validity of multiple personality measuring model of students in Germany and Turkey. The MTMM analysis provided the

Table 1. Discrimination and instrument reliability used for data collection.

Model	Traits	Item	No.	t-value	α
Situation Test (Sbbd)	Confidence in the Triple Gem	9	1-9	2.611 - 6.802	0.708
	Belief in the Law of Karma	9	10-18	2.514 - 13.759	0.825
	Adherence to Buddhist Concepts	16	19-34	3.013 - 8.138	0.792
	Training to Avoid Passions	10	35-44	2.913 - 12.209	0.781
	Commitment on Training Mindfulness	6	45-50	3.227 - 4.892	0.690
	Perseverance in the Pursuit of Knowledge	10	51-60	2.355 - 6.791	0.745
Total		**60**	**1-60**	**2.335-13.759**	**0.937**
Rating Scale Test (Rbbd)	Confidence in the Triple Gem	9	1-9	3.715 - 6.326	0.877
	Belief in the Law of Karma	9	10-18	2.677 - 4.762	0.770
	Adherence to Buddhist Concepts	16	19-34	3.395 - 11.011	0.857
	Training to Avoid Passions	10	35-44	4.236 - 8.759	0.873
	Commitment on Training Mindfulness	6	45-50	8.785 - 11.793	0.866
	Perseverance in the Pursuit of Knowledge	10	51-60	5.668 - 10.222	0.932
Total		**60**	**1-60**	**2.677-11.793**	**0.963**

$t_{(0.05, 58)} = 1.671$.

information on the measurement model in details, and indicated the priority of each feature of the model. Also, Samuel et al. (2013) used MTMM analysis to solve selection problems of complexed behavior instruments. It was found that MTMM analysis provided information to select the instruments suitable for complexed traits or large structures. Jacobs and Roodenburg (2014) used MTMM analysis to test the validity of the model to measure self-efficacy. It was found that MTMM analysis provided detailed information and was quick for determining construct validity of the measurement model. Using MTMM analysis provides advanced analytics in details and is more effective than any other methods to develop and test behavioral science variable measurement of a model. As a result, if MTMM analysis is used to develop and test the validity of the belief in Buddhism model. This will provide clarity in Buddhist belief study more concretely. This will also be used as data for the development and promotion of Buddhist faith of the people in order to promote peace of the society in the future.

Sample

The data providers of this study were the first to third year students of academic year 2015, at Buddhist Scripture School, under the Division of General Education, The Office of National Buddhism in Chiang Rai province. The sample size of this study was approximately ten times the estimated parameters in the model (Hair et al., 2010). There were 58 factor loadings needed for parameter estimation in the assumption model, and they were verified for content validity by experts in Buddhism. As a result, the minimum number of the sample would be 580 monks (58 × 10). In this study, a sample size of 590 monks was used in this study selected by multi-stage random sampling. The school and classroom level were used as unit sampling. It was found that most of the samples were 201 first year students, (34.07%), followed by 196 second year students (33.22%) and 193 third year students (32.71%).

Instruments

The research instruments included two Buddhist belief tests for junior high school students at Buddhist Scripture School. The first test included 60 items of a three-choice situational Buddhist belief test (and a measure of faith in Buddhism; the respondents have to evaluate themselves, and the discrimination was relatively high and the t-value was between 2.514 to 13.759) and the reliability of the entire test (Alpha cronbach s alphas: α) was 0.937. The second test comprised 60 items of a five-scale Buddhist belief test. The respondents had to evaluate themselves which led to a relatively high discrimination (the t-value was between 2.000 to 11.793) and the reliability of the entire test (Alpha Cronbach's alphas: α) was 0.963. Details of the instruments used to collect the data are shown in Table 1.

Data collection and analysis

Data were collected from 590 high school students by cooperating with Buddhist Scripture School where sample were taken manually throughout a one-month period. The data were tested for answer integrity prior to the data analysis.

The data analysis to determine the development of the measurement model employed a second order confirmatory factor analysis using Mplus 7.4 program. The consistency between the developed measurement model and empirical data was considered by using relative chi-square (χ^2/df) that does not exceed 2 of the p-value, CFI, TLI that was greater than 0.950, RMSEA, and SRMR that was less than 0.050 (Steiger, 2007). It can be considered that a model consisting of indicators and elements having structural relationship could explain traits of the belief in Buddhism the junior high school students at Buddhist Scripture School. After that, the validity of the model was tested using Mplus 7.4 program. The consistency of empirical data and convergent validity was studied by comparing the weight of the components (β) between features and the measurement method. The weight of the feature was higher than the weight on the measurement method. This indicates that the variability of the measurement results is not a result based on the methods used to measure, but as a result of the features. The discriminant validity was studied by comparing matrix correlation coefficient of the features, which should be low, and has no statistical significance (Byrne, 2012). It can be considered that

the developed model has construct validity, and can explain the belief in Buddhism of the students at Buddhist Scripture School.

RESULTS

The key findings are summarized as follows:

1. The development of a model to measure the belief in Buddhism of junior high school students at Buddhist Scripture School.

When considering the consistency of the measurement model with empirical data, and from the statistics used to determine the validity of the model, the findings showed that the measurement results on the belief in Buddhism measured by 60 items of situational Buddhist belief test had Chi–Square (χ^2), 128.881; degree of freedom (df),113; and p-value, 0.146. This indicated that the chi-square had no statistical significance, so this Buddhist belief measurement model using situational measurement was consistent with the empirical data. When the index was compared to the level of Comparative Fit Index (CFI), it was equal to 0.997, and Tucker–Lewis Index (TLI) was equal to 0.997. Both values were and close to one. In addition, RMSEA was equal to 0.015; SRMR was 0.029, which was less than 0.050; and relative chi - square (χ^2/df) was 1.141, which was less than two.

Regarding the analysis results of the Buddhist belief measurement model measured by rating scale, it was found that the chi – square (χ^2) was equal to 120.987, degree of freedom (df) was equal to 113, and a p-value was 0.287. It showed that the chi - square had no statistical significance which indicated that the model was consistent with the empirical data. CFI was equal to 0.999, TLI was 0.999, both values were high, and close to one. In addition, RMSEA was equal to 0.011, SRMR was equal to 0.021, which was less than 0.050, relative chi - square (χ^2/df) was equal to 1.071, which was less than two.

From above analysis results, both Buddhist belief measurement model were consistent with the empirical data based on fit index of the model in all respects (Steiger, 2007). This indicates that the hypotheses of the research were correct, and this feature shows a linear relationship from data analysis as shown in Figure 1.

2. The findings of the construct validity model of Buddhist belief measurement model of junior high school students at Buddhist Scripture School by analyzing MTMM.

When considering the consistency of the model with the empirical data using statistics to determine the validity of the model which included χ^2= 33.664, df = 26, p-value = 0.144 CFI = 0.999, TLI = 0.998, RMSEA = 0.022, SRMR=0.032 and χ^2/df = 1.295, the findings showed that χ^2 had no statistical significance. Also, when considering CFI and TLI, they were equal to is one, while RMSEA and the SRMR were lower than 0.050 which were according to the criteria of fit model (Steiger, 2007). It can be said that the model was fit to the empirical data at a good level.

Regarding the analysis of convergent validity, when considering the standard weight coefficients on traits of six variables measured by the Buddhism belief test, the situation type was between 0.837 to 0.987 with a statistical significance level of 0.010 (p-value = 0.000), and all variables had higher standard component weight coefficient on traits than on method of measurement ranging from 0.105 to 0.494. This was in accordance with the variables measured by the Buddhism belief test of six variables rating scale at standard component weight coefficients on traits between 0.728 to 0.863, and all variables also had higher standard component weight coefficients on traits than on the measurement method ranging from 0.455 to 0.627. It can be said that the two types of measurement had convergent validity at a high level since the variability of 12 variables measured by situational Buddhism belief test, and rating scale types result from the variability of the measurement traits than method of measurement (Christian et al., 2015). When comparing the standard component weight coefficients on traits measured by situational test (M1) with rating scale test (M2), it was found that all variables measured by situational test had higher scores than those measured by rating scale test. In conclusion, the situational Buddhism belief test had higher convergent validity than rating scale test. Detailed results are shown in Table 2.

Regarding the analysis of discriminant validity, when considering the relationship between the traits measured by calculating the same model, it was found that both Buddhism belief tests had discriminant validity at a moderate level. The correlation coefficients between traits of 15 pairs of the six traits measured by situational test (M1) were mostly related at a moderate level, ranging from 0.428 to 0.761. For the traits measured by rating scale (M2), it was found that all six traits, 15 pairs, were mostly related between moderate to relatively high level ranging from 0.549 to 0.815. When comparing the correlation coefficients between situational and rating scale test, it was found that all traits measured by situational test were lower than those measured by rating scale test. This indicated that situational test had lower correlation coefficients than those measured by rating scale (Christian et al., 2015). In conclusion, it can be summarized that situational test had higher discriminant validity than rating scale test.

When considering R^2 which represents the ability to explain the variability of latent variables in Buddhism belief that were coefficients of reliability of the traits

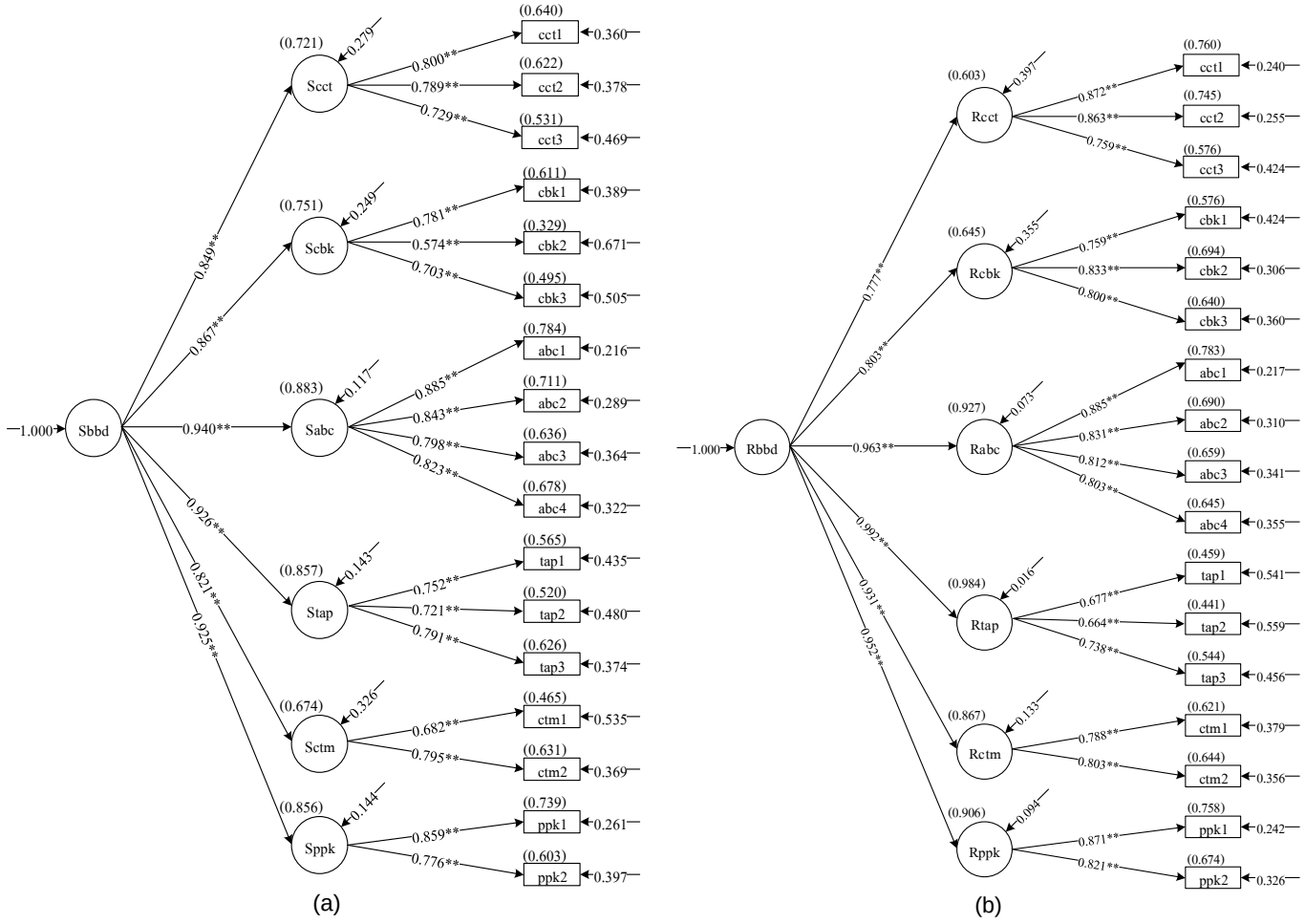

Figure 1. Second-Step Confirmatory Factor Analysis Model a) Situation Test b) Rating Scale Test. 1) ** refers to a p-value < 0.010 2) The number in parenthesis ( ) refers to reliability 3) The values shown in the diagram is the STDYX standardization.

Table 2. Standard component weight coefficient (β) reliability (R**2)** and variability for considering convergent validity.

Characteristic factors		Traits						Method of measurement		R^2	Residual
		CCT	CBK	ABC	TAP	CTM	PPK	M1	M2		
M1	**Scct**	0.918						0.309		0.939	0.610
	Scbk		0.837					0.494		0.945	0.055
	Sabc			0.960				0.105		0.933	0.067
	Stap				0.987			0.116		0.988	0.012
	Sctm					0.855		0.125		0.747	0.253
	Sppk						0.931	0.302		0.958	0.042
M2	**Rcct**	0.863							0.455	0.952	0.048
	Rcbk		0.876						0.467	0.985	0.015
	Rabc			0.739					0.627	0.940	0.060
	Rtap				0.742				0.563	0.868	0.132
	Rctm					0.728			0.570	0.855	0.145
	Rppk						0.760		0.589	0.925	0.075

χ^2 = 33.664, df = 26, χ^2 / df = 1.295,p-value = 0.144, CFI = 0.999, TLI = 0.998, RMSEA = 0.022, SRMR = 0.032.

Table 3. Reliability coefficient **(R^2)** and correlation coefficient for considering discriminant validity and reliability.

Characteristic factors	Traits					
	CCT	**CBK**	**ABC**	**TAP**	**CTM**	**PPK**
Reliability Coefficient R^2						
M1 (Sbbd)	0.939	0.945	0.933	0.988	0.747	0.958
M2 (Rbbd)	0.952	0.985	0.940	0.868	0.855	0.925
Correlation Coefficient						
Scct	1.00					
Scbk	0.761	1.00				
Sabc	0.636	0.569	1.00			
Stap	0.592	0.543	0.718	1.00		
Sctm	0.489	0.428	0.619	0.612	1.00	
Sppk	0.610	0.605	0.690	0.706	0.616	1.00
Rcct	1.00					
Rcbk	0.815	1.00				
Rabc	0.680	0.694	1.00			
Rtap	0.612	0.626	0.751	1.00		
Rctm	0.555	0.549	0.731	0.693	1.00	
Rppk	0.651	0.638	0.754	0.726	0.748	1.00

measured by both tests of Buddhism belief, it was discovered that these traits could explain the variability in the latent variables of the belief in Buddhism at a high level. R^2 was based on the features of the measure with a degree of negative situations ranging from 0.747 to 0.988. In other words, these variables could explain the unevenness in latent variables of approximately 75 to 99 percent, which is less than the traits measured by rating scale that could explain the variability in the variables of 85 percent to 99 percent. When comparing the reliability coefficients between the variables measured by situational test with those measured by rating scale, it was found that the situational test had R^2 in the Concept of Buddhist Karma (CBK), and the Perseverance in the Pursuit of Knowledge (PPK) was higher than the variables measured by the rating scale test. However, the Concept of Confidence in the Triple Gem (CCT), Adherence to Buddhist Concepts/Precepts (ABC), and Training to Avoid Passions (TAP) and the Commitment on Training Mindfulness (CTM) were lower. It can be concluded that rating scale test for measuring the belief in Buddhism had higher reliability than the situational test.

In summary, both tests on the belief in Buddhism had high construct validity. The convergent validity was at a high level. The discriminant validity was at a moderate level, and reliability at a high level. Detailed results are shown in Table 3 and Figure 2.

DISCUSSION

The results of the analysis of consistency between the belief in Buddhism model and empirical data using Second Order CFA Model came out as predicted and the model was consistent with the empirical data. The situational and rating scale tests were consistent with the empirical data at a high level based on the criteria for determining the consistency of model and the empirical data (Steiger, 2007). The important factors may result from the collection of adequate and appropriate data to test the fit of the measurement model in the context of junior high school students at Buddhist Scripture School, which were consistent with the findings studied by Marsh et al. (2013). The model was fit to measure the context of the population or sample that affects the consistency between the measurement model and empirical data.

The standard component weight coefficients (β) of 17 observed variables measured by both tests showed that the results confirmed the importance of observed variables in latent variables. There were five consistent latent variables except for two variables in the law of karma that yielded different results. The results were inconsistent just as other variables in the measurement of the belief in Buddhism. The second latent variable concerning the Concept of Buddhist Karma (CBK) may be caused by the factors on different level of understanding related to the essence of karma in Buddhism of the students at the Buddhist Scripture School (Dowling, 2006; Hirota, 2004) and they may have experienced a biased situation, as well as choices on the situational test (McAllister and Guidice, 2012). In that situation, the choice of latent variables concerning karma may be too confusing or beyond the level of students' competence. For example, a student asked an abbot "I

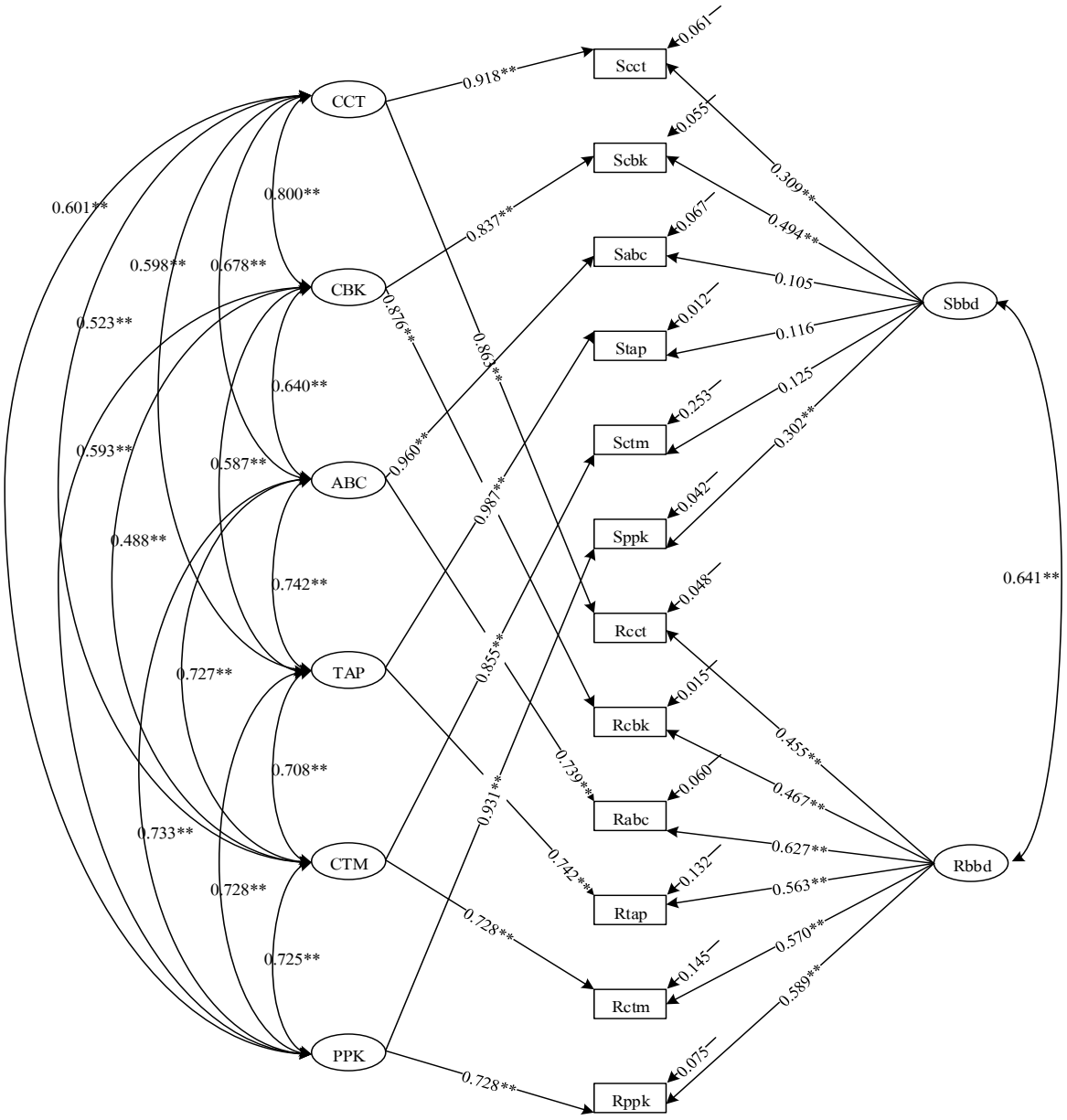

Figure 2. Multitrait-Multimethod analysis model. 1) ** refers to a p-value < 0.010 2) The values shown in the picture is the STDYX Standardization.

hired a gunman to intimidate my enemy, but the gunman missed the shot, and made my enemy's brother die. Would all the incidents happen to my family and that mistaken action make me a sinner? "

In addition, the standard component weight coefficients of latent variables on the belief in Buddhism in the confirmatory factor analysis of the second stage of the six variables measured by two tests confirms the importance of different variables. This may be because of the level of different standard component weight coefficients of observed variables in each instrument. This may differently confirm the analysis results of the elements at the second stage (Sunthud et al., 2014).

The analysis of construct validity using MTMM analysis came out as predicted. The convergent validity and reliability were at a high level while discriminant validity was moderate. The high-level convergent validity resulted from the variability of scores from the Buddhism belief measurement. It was a result of the variability of latent variables in the model and not from measurement

methods (Byrne, 2012; Nussbeck et al., 2009). The moderate-level discriminant validity may result, principally from few traits and methods. The number of traits and appropriate minimum measurement methods for confirmatory factor analysis of MTMM include three features and three methods. On the other hand, there should be at least four traits and four methods and the percentage of correct analysis should increase. When the number of traits and measurement method increases the MTMM design would be large (6T x 6M, 7T x 4M, etc.) This model is a measurement of the belief in Buddhism. This study included only two methods of measurement. Indicators of the components or latent variables that may cause the above were partly a result of inappropriate element indicators elements leading to the likelihood of accurate analysis results. Each trait should consist of at least three indicators. Certain traits in the model of measuring the belief in Buddhism in this study included only two indicators, and this may be a factor resulting in moderate-level discriminant validity (Millsap, 1995).

CONCLUSION AND IMPLEMENTATIONS

The results of this study are suggested to be implemented on measuring the belief in Buddhism of junior high school students at Buddhist Scripture School, which consists of six traits and 17 observed variables, and they were consistent with the empirical data at a high level. Therefore, it is appropriate to use this model to measure and assess the belief in Buddhism of students at Buddhist Scripture School alone. If applying to other groups which may have a different context, the consistency with the empirical data should be checked every time prior to the use of the model in order to obtain an accurate information as possible which contributes to policy planning for the development and promotion of the belief in Buddhism in the society sustainably. In using these two types of tests, users should emphasize that test takers must use correct information to answer the questions as possible. They should stipulate the benefits of using true information such as selecting honest people to receive a scholarship. Another important aspect is the time management of taking both tests. They should be taken separately for at least one to two days so that the test takers would not be bored or stressed, and the conditions for the return of the tests should be placed. For example, if the test time does not exceed 30 minutes, they cannot submit the test. If conditions are not established, the test takers may not pay attention which would lead to incorrect information at a high level.

Moreover, if those involved in developing and promoting the belief in Buddhism of junior high students at Buddhist Scripture School need to measure the belief to serve as a guideline in planning to improve and promote the faith among such students who would be leading in the future, they should use situational test as an instrument. However, if they need more detailed information, they should measure five traits of the belief in Buddhism: the concept of confidence in the triple gem, adherence to Buddhist concepts/precepts, training to avoid passions, commitment on training mindfulness, and perseverance in the pursuit of knowledge with situational and trait test. On the other hand, rating scale measurement is suitable for measuring the concept of Buddhist karma.

For future studies, this research is beginning to develop and test the reliability of the model in measuring the belief in Buddhism using Multitrait-Multimethod Analysis (MTMM). If there is a need for results analysis or more detailed information, the construct validity should be examined by the second or third order of MTMM, which would provide details of the moderating effects to contribute to further development of other factors that have influence on the belief in Buddhism and a variety of methods should be added to reduce the factors that cause errors in the analysis model, such as carrying out peers or teachers evaluation. Other forms may also be used, such as CTCU which is a MTMM model since the model has strength and resistance toward analysis errors more than CFA-CTCM model which was used in this study.

Conflict of Interests

The authors have not declared any conflict of interests.

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