

Quality of Psychology Test Between Likert Scale 5 and 6 Points

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Abstract: Problem statement: The purposes of this research were (1) to study the quality evaluation psychology test Likert's scale 5 and 6 points (attitude test, locus of control test and achievement motive test) focusing on construct validity, discrimination and reliability, (2) to compare the study of quality psychology test between Likert's scale 5 and 6 points and (3) to compare the study for personal decision making level between Likert's scale 5 and 6 points. **Approach:** The subjects were 180 (60 for each test) undergraduate students from Mahasarakham University who were selected by purposive sampling. **Results:** The research tools were attitude test, locus of control test and achievement motive test comprised of measurement patterns developed for different variables. Means, standard deviation, Factors Analysis, Alpha Coefficient and t-test were used for data analysis. **Conclusion/Recommendations:** The research revealed that (1) higher component and Initial Eigenvalues cumulative percent of psychology test Likert's scale 5 and 6 points, but psychology test Likert's scale 6 points had more higher trend of discrimination and reliability than Likert's scale 5 points, (2) construct validity, discrimination and reliability among Likert's scale 5 and 6 points were compared. It was found different reliability at 0.05 level on achievement motive test only and (3) personal decision making level psychology test among Likert's scale 5 and 6 points was different at 0.05 level.

Key words: Quality of test, psychology test, Likert's scale

INTRODUCTION

The measurement or the test of variables in terms of Behavioral Sciences and Social Sciences (Psychology, sociology and anthropology test) the measurement form or test in various types by holding the basic principles of science have been developed. The various measurements have been carried out in order to be in accordance with the dimensions of measurement of personals attributes perfectly. The measurement or the test is divided into 2 main attributes including Behavior Observation and Self-Report (Murphy and Davidshofer, 2004). There are a lot of measurement forms or tests and can be divided into several kinds of own report. However, The measurement of personal attributes especially the internal attributes which can be measured easily, conveniently, quickly and give the certain and constant results usually use the measurement form or the test of Rating Scale (Wright and Masters, 1982) especially the measurement of attitude, opinion level, satisfaction, motivation, self discipline, self efficacy. This kind of measurement has a lot of aspects but the popular one is Renis Likert rating scale (Aiken, 2000; Cohen and Swerdlik, 2001; Gregory, 2003). The Renis Likert

rating scale was begun around 50 years ago (Chang, 1993). Its advantages are (1) the consideration criteria is certain and easy to use and (2) The questions are not too many but give higher reliability than other rating scale types (Snaw and Wright, 1967).

Scale is considered to be the new approach of Renis Likert rating scale to measure personal attributes which are 4-Point Likert Type Scale or 6-Point Likert Type Scale. This concept is regarded as the model which is appropriate for measurement (Chang, 1993). The scale is cutting the opportunity of choice for answering without considering the items of measurement. The respondents cannot choose the moderate value, middle point in this kind of rating scale because the respondents have to choose between one of the two qualifications of the scale to be the answer, with this method, the respondents have to consider for a while or a level.

According to the study of behavioral sciences, the question usually found is what kind of Likert Scale should be used. There is still only a few study of comparison on the quality of instruments among the test or measurement forms which have different scales. Therefore, the researcher views that if this issue is taken into account for the study, it would likely help the

researcher who uses the psychology test of Likert Scale for his or her study will have the opportunity to choose and decide that which kinds of the test they will use. Hence, the researcher carried out the research project of "The study of comparison of the quality evaluation psychology test Likert's scale 5 and 6 points" for the reasons of academic needed which have been mentioned above.

Objectives:

- To study the quality evaluation psychology test Likert's scale 5 and 6 points (attitude test towards the alcohol drinking, locus of control test and achievement motive test) focusing on construct validity, discrimination and reliability
- To compare the study for quality psychology test between Likert's scale 5 and 6 points, (attitude test, locus of control test and achievement motive test) focusing on construct validity, discrimination and reliability
- To compare the study for personal decision making level between Likert's scale 5 and 6 points

Hypothesis:

- The quality evaluation psychology test Likert's scale 5 and 6 points has the construct validity, discrimination and reliability of the test differently
- The quality evaluation psychology test Likert's scale 5 and 6 points has the level of difficulty of decision making to answer the psychology test differently

MATERIALS AND METHODS

The population is the undergraduate students from Mahasarakham University. This is not emphasizing the scope of population because this is the study of quality evaluation test not focusing on the students attributes evaluation in various variables used for the study. The samples for data collection of the test are 180 (60 for each test) undergraduate students determined the size by using the research budgets to be the main. The samples were selected by purposive sampling according to the test issues which the researcher was conducting. The instruments of the study included 3 psychology test including the attitude test towards the alcohol drinking, locus of control test and achievement motive test together with level test of difficulty and easiness of decision making to answer the psychology test.

Data was analyzed according to the procedure, mean and standard deviation for the explanation of

general information of various variables used in the research. Initial Eigenvalues Value for the consideration of Component Factor Value for the analysis of construct validity of the testing instruments. Then, t-test for the consideration of instruments test discrimination. It is divided into high and low groups for the analysis with 27 techniques and 73 percentiles. Alpha Coefficient value for the consideration of reliability value of the testing instrument. Finally, t-test examination for comparing analysis the quality of testing instrument.

RESULTS

The analysis results of construct validity revealed that it was according to the achievement motive test, the scores from Likert's scale 5 and 6 points can give the numbers of components unequally different in 1 component. The Likert's scale 5 points can give 6 components. Whereas Likert's scale 6 points can give 5 components, the collected percentage of variance of all components had similar values which were the Likert's scale 5 points had the value equal to 72.67 and Likert's scale 6 points was equal to 72.15. According to the attitude test towards alcohol drinking, it was found that the test scores of Likert's scale 5 and 6 points gave the numbers of component unequally different in 1 component which were the Likert's scale 5 points gave 4 components whereas Likert's scale 6 points gave 5 components. However, the collected percentage of variance of all components had the values rather different. It was found that the Likert's scale 5 points had the value equal to 61.09 lower than the Likert's scale 6 points equal to 69.46. According to the locus of control test, the scores from the test of Likert's scale 5 and 6 points gave the numbers of component equally and the collected percentage of variance of all components had similar values which were the Likert's scale 5 points had the value equal to 64.44 and the Likert's scale 6 points had the value equal to 63.17.

When considering the discrimination, it was found that as a whole, the Likert's scale 6 points gave the discrimination value from the test higher than the Likert's scale 5 points. If considering each variable, it was found that according to the achievement motive test, Likert's scale 6 points gave higher value than the Likert's scale 5 points for 10 items from all of 15 items. According to the attitude test towards alcohol drinking, it was found that the Likert's scale 6 points gave higher value than Likert's scale 5 points for 9 items from all of the 15 items whereas the locus of control was found that the Likert's scale 5 points gave higher value than the Likert's scale 6 points for 8 items from all of the 15 items.

According to the reliability value as a whole, the Likert's scale 6 points gave the reliability by Cronbach's Alpha Coefficient higher than the Likert's scale 5 points. When considering each variable, it was found that the achievement motive test of Likert's scale 6 points gave higher value than the Likert's scale 5 points in every item from all of the 15 items. According to the attitude test towards alcohol drinking, it was found that the Likert's scale 6 points gave higher value than the Likert's scale 5 points for 8 items by giving the lower value for 1 item and for the rest 6 items gave the reliability value now differently. According to the locus of control, it was found that the Likert's scale 5 points gave the higher value than the Likert's scale 6 points for 6 items and whereas the rest 9 items gave the reliability not differently.

When comparing the discrimination between the Likert's scale 5 and 6 points by t-test analysis, it was found that the discrimination of each item (including all items) was not different by statistically significant at 0.05 whereas the comparison of estimated value of reliability of the test by Alpha if item deleted in each item (including all items), it was found that the estimated value of reliability for Alpha if item deleted in each item (including all items) was different by statistically significant at 0.05 level on achievement motive test only. The Likert's scale 6 points had the estimated value of reliability of Alpha if item deleted in each item (including all items) higher than the test of Likert's scale 5 points.

When comparing the difficulty level of decision making for answering the test in each item (including all items) between Likert's scale 5 and 6 points by t-test value analysis, it was found that the difficulty level of decision making for answering the test in each item (including all items) of the attitude test towards alcohol drinking and locus of control test of Likert's scale 6 points had the higher value than the Likert's scale 5 points by statistically significant at 0.05 level whereas the achievement motive test wasn't found the difference by statistically significant at 0.05 level.

DISCUSSION

The result of the study can be revealed that the Likert's scale 5 and 6 points of the achievement motive test, attitude test towards alcohol drinking and locus of control had the construct validity from the similarity of component analysis by having the collected percentage of variance at all components similarly. The results caused from the contents of the test were the same things. Therefore, although there were different scales, it had no any result to the validity because the test could

measure the things which need to be measured according to the variable definition. If considering the discrimination by t-test, it was found that the Likert's scale 6 points gave the discrimination from the t-test higher than the Likert's scale 5 points for 2 types of the test which were the achievement motive test and attitude test towards alcohol drinking whereas the locus of control was found that the Likert's scale 5 and 6 points gave the discrimination which might be regarded as it was not any different because the response of the samples in some parts affected the results of discrimination value in terms of some respondents didn't want to answer or answer unwillingly or answer in order to be finished without considering the issues which the researcher had asked or wanted to measure. Perhaps, the respondents who felt like this would decide to answer the questions by selecting the middle point of the rating scale test of Likert's scale 5 points. Moreover, the respondents who were considerate the researcher usually answered the questions moderately in the item which they were a little disagree, therefore it made the discrimination was lower than the Likert's scale 6 points which had the answers which forced the respondents to present their behavior only one choice. However, both 2 types of the tests gave the discrimination at the acceptable level according to the standard of psychology test.

According to the validity from Alpha Coefficient, it was found that the Likert's scale 6 points gave higher reliability than the Likert's scale 5 points for 2 tests which were achievement motive test and attitude test towards alcohol drinking. Whereas the variables of locus of control, it was found that the Likert's scale 5 points gave higher value than the Likert's scale 6 points. According to the Likert's scale 5 points which had the trend to give high reliability, it was because the numbers of forced scales which the respondents had to consider to select only one item without opening the opportunity to the respondents to answer the middle choice in the case that he or she didn't want to answer or answer without thinking or lazy to answer whereas the Likert's scale 5 points gave the opportunity for the respondents to answer the middle choice in the case that the respondents answered the questions without considering because they might think that answering the middle choice didn't affect any disadvantage to the data analysis of the research. According to that discovery, Rosenberg (1965); Crandal (1973) and Wylie (1974), the psychologist who was well-know for all over the world who had developed the personal self esteem test considered the various test scales before making the decision to use the Likert's scale for testing such variables by testing with 5.024 samples.

The study results revealed that according to the construct validity, it was found that the Likert's scale 5 and 6 points gave the numbers of component which was considered not different. And when considering the collected percentage of variance of all components, it was found that the Likert's scale 5 and 6 points had similar values. The results was found like this because the qualifications of the questions of both tests were the same questions and only different for the choice. If the respondents were constant in answering, it affected the results of the test which were concordant to each other.

According to the discrimination of the test, when comparing analysis the discrimination in each item (including all items) between Likert's scale 5 and 6 points with t-test and t-test, both of the tests had the discrimination not differently by statistically significant at the 0.05 level in every type of the tests. This was because both of the tests had a high discrimination, therefore the difference of the averages of the discrimination gave the statistic test results not differently although the Likert's scale 6 points gave the discrimination from the t-test higher than Likert's scale 5 points for 2 types which were the achievement motive test and attitude test towards alcohol drinking whereas in terms of locus of control found that there was no any difference. The results revealed like this because the Likert's scale 6 points had the choices to be chosen separated obviously between agree and disagree (each of 3 choices), therefore the respondents had to choose to present their behavior from one of them instead of answering moderately in the Likert's scale 5 points which had 1 choice in the middle which was not indicated the respondents to present their behaviors, therefore the discrimination value had he trend less than the Likert's scale 6 points.

In sum, reliability of the test with Alpha if item deleted in each item (including all items) between Likert's scale 5 and 6 points with the t-test, it was found that the Likert's scale 6 points had the estimated value of reliability of the Alpha if item deleted in each item (including all items) higher than those Likert's scale 5 points only in the achievement motive test whereas other variables test gave the reliability which was regarded as had no difference. The difference is not concerns only one variable, but also it was the numbers of collected samples. Moreover both of the tests can give the reliability rather in highly, therefore the difference found when testing in the statistic gave no any statistically significant. However, when considering in terms of reliability details, it was found that the Likert's scale 6 points tended to give the reliability higher than the Likert's scale 5 points

which was in accordance with the study of Chang (1993) who compared the advantages of Likert's scale 4 and 6 points found that the validity and reliability was higher than Likert's scale 4 points (the more scales gave the higher value)

This study reported that the level of difficulty in decision making of answering the test in each item (including all items) between Likert's scale 5 and 6 points with t-test analysis, it was found that the level of difficulty in decision making of answering the test in each item (including all items) of attitude test towards alcohol drinking and locus of control test of Likert's scale 6 points had higher value than Likert's scale 5 points by statistically significant at 0.05 level whereas the achievement motive test found that the level of difficulty in decision making of answering the test in each item (including all items) of the Likert's scale 5 and 6 points was not different by statistically significant at 0.05 level. The result found like this because each scale meant the choice that the respondents had to make a decision. Having choices to make a decision more, the samples had to use the time to consider more. Although there wasn't found the difference in the achievement motive test, when considering the statistic value, it was found that there was the value rather similar to the statistically significant level. If studying in more numbers of the samples, it might be found that the Likert's scale 6 points tended to use time to consider and decide more. It could be seen that from the research about evaluation of product use of Microsoft company (Bargeron and Moscovich, 2003), the researchers of the company wanted high reliability of the research results in order to reduce risks from business which might cause the research results were missed reality, therefore the decided to use the Likert's scale 6 points instead.

CONCLUSION

- The study result revealed that the Likert's scale 6 points tend to give the discrimination and reliability values which are higher than the Likert's scale 5 points. If they wanted to emphasize the discrimination and reliability high, therefore they should use the Likert's scale 6 points
- If want to reduce the deviation to be the least or reduce the risks which might be happened from the deviation of personal decision making, it should choose the Likert's scale 6 points instead of Likert's scale 5 points
- Likert's scale 6 points is appropriate to the research which has several variables because it will make the test as a whole has the numbers of items not to

many and it will not be the burden of the respondents while the reliability is acceptable according to the standard of psychology test

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REFERENCES

- Aiken, R.L., 2000. *Psychological Testing and Assessment*. 10th Edn., Allyn and Bacon, Boston, pp: 360.
- Bargeron, D. and T. Moscovich, 2003. Reflowing digital ink annotation. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Apr. 5-10, ACM Press, Ft. Lauderdale, Florida, USA., pp: 385-393. DOI: 10.1145/642611.642678
- Chang, L., 1993. Using confirmatory factor analysis of multitrait-multimethod data to assess the psychometrical equivalence of 4-point and 6-point likert type scales. *Proceeding of the Annual Meeting of the National Council on Measurement in Education*, Apr. 13-15, ERIC, Atlanta, GA., pp: 1-47.
- Cohen, R.J. and M. Swerdlik, 2001. *Psychological Testing and Assessment: An Introduction to Tests and Measurement*. 5th Edn., McGraw-Hill, Boston, ISBN: 10: 0767421574, pp: 800.
- Crandal, R., 1973. The Measurement of Self-Esteem and Related Constructs. In: *Measures of Social Psychological Attitudes*, Robinson, J.P. and P.R. Shaver (Eds.). Institute for Social Research, Arbor, MI., pp: 80-82.
- Gregory, R.J., 2003. *Psychological Testing: History, Principles and Applications*. 5th Edn., Pearson Education, Boston, ISBN: 10: 0205354726, pp: 654.
- Murphy, K.R. and C.O. Davidshofer, 2004. *Psychological Testing Principles and Applications*. 6th Edn., Prentice-Hall, New Jersey, ISBN: 10: 0131891723, pp: 624.
- Rosenberg, M., 1965. *Society and the Adolescent Self Image*. 1st Edn., Princeton University Press, New Jersey, ISBN: 10: 0691093350, pp: 326.
- Snaw, M.E. and J.M. Wright, 1967. *Scale for Measurement of Attitude*. 1st Edn., McGraw Hill Inc., New York, pp: 108.
- Wright, B.D. and G.N. Masters, 1982. *Rating Scale Analysis*. 1st Edn., MESA Press, Chicago, ISBN: 10: 0941938018, pp: 206.
- Wylie, R.C., 1974. *The Self-Concept*. 1st Edn., University of Nebraska Press, Lincoln, NE., pp: 433.