

Analysis of the Point Scale Range within the Scope of Data Characteristics and Quality: An Inference on Optimal Point Scale Range

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Extensive Summary

Introduction

The fact that the psychometric scales are now widely used in marketing and management sciences; that the approaches that are not appropriate for the purpose and method are applied and the quality of the data obtained via the questionnaire are now questioned and discussed. These discussions have been continued over methodological details such as systematic error, non-systematic error, response bias, non-response bias and number of participation level options (Armstrong and Overton, 1977; Meade and Craig, 2012; Barber et al., 2013). Especially when the researches where these discussions are continued over the number of options of the participation level, it can be observed that the number of options of the participation level may have effects on the participation levels of the participants to the items (Dawes, 2002), the reliability coefficients of the scales (Cronbach, 1950; Bendig, 1953; Komorita, 1963; Jacoby and Matell, 1971) and response time to scale items (Bevan and Avant, 1968; Matell and Jacoby, 1972).

Putting forth different and improved new analysis techniques (i.e. Rasch analysis, partial least structural equality modelings, conditional process analysis, finite mixture partial least squares analysis) is accepted in marketing and management sciences and applied within the scope of research projects by the researchers. On the other hand, this new and improved analysis techniques are known to be sensitive towards the data characteristics (Dawes, 2008). In this sense, the importance of association of the method

and analysis techniques and this association fulfilling the scientific discipline and requirements cannot be ignored. In other words, the analysis period where the research findings are in the process of obtaining is very sensitive towards the method and methodology followed. Hence the first objective and contribution of this research is to examine the number of options of the participation level regarding the method and methodology, to test whether the analysis results are sensitive towards the number of options of the participation level and to reveal a graphic regarding the sensitivity. The second contribution of this research is to be able to make suggestions and inferences regarding the determination of optimal number of options of the participation level which has been purified from systematic error within the universe and culture (Cox, 1980). The final contribution of this research is to examine the effect of the number of options of the participation level, which is methodological choice within the scope of data characteristics and quality.

Method

The data collection phase of the research has been carried out on the students of Faculty of Economics and Administrative Sciences of Eskisehir Osmangazi University by means of convenience sampling method in January 2014. The research data has been collected with drop and collect method. This study has methodological research questions and does not attempt testing a specific theory or revising such theory. In this sense, the population of the research can be defined as the students of Faculty of Economics and Administrative Sciences of Eskişehir Osmangazi University. As mentioned before, the questionnaire is the data collection instrument of this research and the questionnaire form includes the brand image scale developed from the works of Martin and Brown (1990), Aaker (1996), Weiss et. al. (1999) and Villarejo (2002) by Salinas and Perez (2009) and consisting of four items; the brand loyalty scale developed from the works of Kim and Kim (2005) and Yoo et al. (2000) by Severi and Ling (2013) consisting of four items; customer satisfaction scale developed by Hsu (2008) and consisting of three items and finally, the items determined to the demographical characteristics of the participants (gender and age). The participation level for the scale items included in the questionnaire form that is the data collection instrument of the research is numbered with 5, 7 and 11 intervals as "I definitely agree,....., I definitely do not agree". The expert opinions have been taken in order for the scales to fulfill the internal validity and translation/back-translation method has been applied. In addition, the scale items have been finalized by means of pilot questionnaire administration.

In the research, the data has been collected by means of three different questionnaire forms. The data collection period with these three different questionnaire forms occurs due to the methodological design of the research. The structure of questionnaire forms and the numbers of participation level options of questionnaire forms are as follows in Table 1.

Table 1. Numbers of participation level options of questionnaire forms

	Brand image	Brand loyalty	Customer satisfaction
Questionnaire-1	5	5	5
Questionnaire-2	5	7	7
Questionnaire-3	5	11	11

The number of options of the participation level for the brand image scale has been kept stable as 5 (5 response range) in 3 different questionnaires. The main reason for the fact that number of options of the participation level for the brand image scale has been kept stable as 5 in 3 different questionnaire is to obtain evidence regarding the fact that three different samples taken from the same universe as a result of the variance analysis to be carried out is homogeneous among themselves. Thanks to this evidence, the argument regarding the fact that the statistical differences that might arise concerning the different number of options of the participation level do not occur due to heterogeneity among the samples. On the other hand, the participation level numbers of the brand loyalty and customer satisfaction scales have been framed differently in each of 3 questionnaires (5, 7, and 11). The reason for this framework is to be able to measure and test the data characteristic and the differences in analysis results due to the number of options of the participation level. As stated above, the data of this research is obtained via three different questionnaire forms during three-phased data collection period. The three different samples in three-phased data collection period is different from each other and each sample is taken from the universe consisting of the students of Eskişehir Osmangazi University Faculty of Economics and Administrative Sciences.

Results

First of all, it has been observed that the more the number of options of the participation level, the more the increase in the internal consistency coefficient; however, that this increase indicated a statistically significant change in 5 and 11 number of options of the participation level. It is possible to infer in a matter of speaking that the number of options of the participation level may cause some differences in psychometric scale.

Second of all, the findings regarding the fact that the covariance matrices among the latent phenomenons (variables) such as attitude and tendency which has been the aim to be tested via psychometric scales have differentiated in a systematically and statistically significant way depending on the number of options in participation level and that the correlation coefficients have also differentiated systematically but has not differentiated in a statistically significant way has been reached within the scope of the limitations of this research. In other words, the choice to be made by the researcher between 5, 7 or 11 participation level option count poses a statistically significant difference in the covariance matrices among the researched variables.

Finally, no systematic relation has been observed between the number of participation level options and the normal distribution of data. In other words, the data has not been able to procure normal distribution structure in three different counts of participation level (5, 7, and 11). It has also been observed that the data does not have a tendency depending on the count of participation level within the scope of skewness and kurtosis levels.

Conclusion

In conclusion, this research suggests 11 as the number of options of the participation level for the researchers as optimal number of options of the participation level. Weijters et al. (2010) suggested an increased number for the number of options of the participation level for student participation and 5 as the number of options of the

participation level for general sampling. In this sense, the results of this research and the research conducted by Weijters et al. (2010) display coherence.