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REVISITING THE SEVEN COMMANDMENTS FOR USERS OF MULTIVARIATE METHODS

REVISITANDO OS SETE MANDAMENTOS PARA USUÁRIOS DE MÉTODOS MULTIVARIADOS

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While multivariate methods are extremely relevant to marketing problems, it is not easy to successfully implement them in the research program of the organization due to their complexity and variety. Therefore, a number of practical guidelines are described below which should be followed by researchers if they are committed to the idea of integrating multivariate methods in their research programs.

First, try not to be technique-oriented. It is not uncommon to find researchers who are comfortable with, and experienced in, a particular multivariate method such as multidimensional scaling, factor analysis or LISREL and who try to use that technique across all research problems. They seem to be literally in search of problems which will fit the technique rather than the other way around. Often this leads to re-definition of the problem just so it meets the specifications of the technique. No single technique can solve all research problems, however, and this "Tom Swift and his electronic machine" attitude has resulted in many misapplications of multivariate methods. While it is easy to explain this attitude as due to narrow specializations and discipline biases, it is highly hazardous to the long-term survival of multivariate methods in marketing research. In fact, this technique-oriented myopic attitude of the researcher may well be the cause for the downfall of multivariate methods just as it did for operations research models several decades ago.

Second, consider multivariate methods as information inputs to managerial decisions rather than as their substitutes. Often a researcher gets carried away in building models and attempts to replace managerial judgment with the model. Unfortunately, this is suicidal in view of the fact that marketing research is only a staff function whose legitimate role is to provide the necessary inputs for managerial decisions. Most managers tend to be satisfiers rather than optimizers, given the complexity of decisions and the press for time. They regard research as useful input to their judgmental process but do not wish their judgment skills to be replaced by models and computers. In short, it is in the best interest of the researcher to be client centric where his clients are the managers.

Third, multivariate methods are not substitutes for the researcher's skills and imagination in the proper design of the study. Statistics has nothing to do with causality and can never replace prior theory or experimental design. Unless the problem is adequately conceptualized, it is very easy in today's world of fast, efficient and inexpensive computerized calculations to evoke the GIGO principle (garbage in-gospel out)!

Fourth, half the battle in market research is proper communication of techniques and display of results. It is not uncommon at all to find a brilliant researcher totally competent in multivariate analysis whom the management or even others in the research department simply cannot understand. His or her communication about the beta weights, heteroscedasticity, eigenvalues, varimax rotations, vectors, configurations and Kruskal's stress are Chinese and Sankrit to the management. Consequently, the most carefully designed studies with highly relevant results for managerial planning go wasted because the management simply cannot understand let alone utilize them as inputs to its decision-making process. It is indeed a sad state of affairs in marketing research that too little emphasis is placed on the art and science of display and communication and too much emphasis is placed on the marginal elegancies of techniques and computer programs.

Fifth, avoid making statistical inferences about the parameters of multivariate models. This is simply impossible to do in the social sciences due to the substantial existence of nonsampling or measurement errors in the data. No sampling theory can as yet offset this nonsampling error even if one has the resources to sample the total population. Furthermore, it is not easy to apply sampling procedures in the social sciences where we often don't know the population itself. Unfortunately, too often multivariate methods have been criticized, chastised and even discarded as irrelevant tools and techniques because it is impossible to make statistical inferences. While it is true that multivariate methods demand far more stringent requirements of multinormal distributions, it should be pointed out that distribution assumptions underlying statistical techniques even in the univariate and bivariate analysis are also impossible to meet in marketing research.

A better strategy, therefore, is not to discard the techniques as irrelevant but to put them to use for other purposes such as for making substantive directional inferences or as descriptive statistical techniques by which large data sets can be reduced to meaningful and concise summaries for managerial inputs, In other words, multivariate methods are more useful as data transformation, data reduction and as data display techniques than as mathematical models. This is not the fault of the techniques but arises from the limitations of existing methods of data collection.

Sixth, guard yourself against the danger of making substantive inferences about market realities which may be an artifact solely due to the peculiarities of a particular multivariate method. Since multivariate methods are more complex statistical procedures, there are many more underlying assumptions required for the optimization (minimization or maximization) of statistical decision rules. Consequently, it is easier to inject substantive meanings into the data even if the data are essentially stochastic relationships. This has been especially true of those multivariate methods such as cluster analysis, multidimensional scaling and conjoint measurement which possess no underlying sampling theory, and therefore are essentially heuristics often no better than wise judgmental rules.

In order to guard against this danger, it is recommended that the same data be subjected to at least two different techniques. Often, this may be limited to two or more variations of the same basic multivariate method. The replication principle underlying this recommendation will at least bring to the researcher's attention the presence of a technique artifact in his or her data analysis.

Finally, exploit the complementary relationship inherent between the structural and the functional multivariate methods. For example, it is extremely advantageous to subject the original predictor variables to a factor analysis and utilize the transformed factor scores

as derived predictor variables in a multiple regression because it makes the data more closely match the requirements of lack of multicollinearity and nonsampling error and the presence of normality of the distribution. Similarly, it is best to utilize cluster analysis first to define the number of mutually exclusive groups or segments before attempting a multiple discriminant analysis. In short, this guideline urges the researcher to replace or at least substantiate a number of judgments he or she has to make in order to build functional multivariate methods, with a structural multivariate analysis of the data. More often, the researcher's judgment is highly tenuous and sometimes patently wrong which increases the probability of building less useful multivariate models.

In conclusion, multivariate methods are highly relevant to marketing problems. However, due to lack of familiarity with them, their innate complexity and large variety, it is easy to misapply these techniques. Several practical suggestions have been made in this paper to increase the likelihood of getting more out of the multivariate methods. Perhaps the single most important guideline to recommend is: don't be enamored by them.