SEMANTIC QUANTIFICATION: A CROSS-CULTURAL PERSPECTIVE

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Abstract

Marketing research makes extensive use of semantic stimuli in scaling procedures. Magnitude estimation provides a technique for assessing respondents' quantitative assessments of words or phrases used as scale anchor points. Hispanic and non-Hispanic respondents estimated the numerical value of a series of expressions of amount. Minimal differences were found between the cultural groups.

Introduction

Consumer research in marketing makes extensive use of assessments of amount, frequency and evaluation. A consumer respondent might be asked to assess to what extent he/she agrees with a statement of product utility, the degree of importance associated with a given product attribute or the frequency with which a given product is consumed in the household. For example a question could ask, "How often do you dine out?" Possible responses to such a question could include "regularly," "occasionally," "not too often," etc. There are a wide array of such modifiers available to express the range of such judgements as to both amount (none at all) and frequency (never to always). In the qualitative mode a respondent might be asked to assess the taste of a beverage on an evaluative (good/bad) scale.

The analytical phase of such consumer research typically involves attaching numerical values to responses. The level of data (ordinal, interval or ratio) obtained by such attachments is conjectural as is often the appropriateness of the specific value assigned. Response values are assigned on the basis of position on a linear scale, on the basis of the meaning of the adjective label used, or on some combination of both (Green and Tull, 1978, Churchill, 1979). Recent research has supported the importance of label modifiers as a factor governing subject responses (Wildt and Mazis, 1978).

A research tradition has been evolving to quantify the semantic stimuli utilized in scale point description. Recent studies have indicated that such semantic stimuli can be quantified (Bass, Cascio and O'Connor, 1974, Schreisheim and Schreisheim, 1978, Bradburn and Miles, 1979).

Cross-cultural market research is assuming increasing importance with the internationalization of marketing. However such research raises some very significant methodological questions. Green and White (1976) discussed these issues in a recent paper. A major problem area that they identified was that of measurement, i.e., do research instruments validly measure the phenomena under study in each of two cultures? As cross-cultural analysis is typically searching for similarity and/or difference on a cultural basis the investigative issue is whether research results are an artifact of the research process, or more specifically the research instrument, or that the results truly reflect the underlying reality.

The specific issue investigated in this study involved the assignment of numerical values to a series of terms used to express amount in a semantic mode. The re-search was designed to determine if there was a cultural component in the determination of these quantitative values. The research hypothesis may be succinctly stated: "Respondents from different cultures (Hispanic and non-Hispanic) will assign different quantitative values to a set of seven expressions of amount."

Method

The investigation draws heavily on the research tradition of psychophysics, the discipline which is concerned with the measurement of sensory and perceptual phenomena (Stevens, 1975). The particular technique utilized in this research was magnitude estimation which utilizes direct quantification of semantic stimuli by the respondent (Stevens, 1975, pp. 26-31). The distinguishing characteristic of magnitude estimation is that it permits the achievement of the highest level of measurement, namely the ratio scale. As Stevens notes in comparing magnitude estimation to the more typical procedure (in marketing research also) of category scaling.

"... the category scaling procedure seems seductively simple. As a consequence, unfortunately, the procedure enjoys unmerited popularity. Category procedures result at best in interval scales, not in ratio scales. In most cases only a slight rewording of the instructions would allow the observer to employ, not a restricted set of category numbers, but any numbers he thinks appropriate to express the apparent magnitude of the stimulus. It would then be possible for the observer to generate a ratio scale." (Stevens, 1975, p. 231)

The research made use of the following seven expressions of amount: "no", "somewhat", "a moderate amount of", "quite a bit of", "a great amount of", "an extraordinary amount of", and "all". Previous investigation had suggested that these seven expressions of amount provided an equal-interval ratio scale, the level of measurement which provides the maximum degree of analytical versatility. The value generated by the semantic stimulus, "no", represented the zero on the scale derived by Bass, Cascio and O'Connor, (1974). The instructions provided to subjects are descriptive of the technique of magnitude estimation and are reproduced below:

In subsequent questions, you will be asked to determine how important various characteristics are when choosing a university. For example, you may feel that the quality of a business school's faculty is "somewhat" important to you in choosing a university. Would you please assign a number to what you conceive "somewhat" to mean. You may use any number that seems appropriate to you and is greater than, or equal to, zero (0). Please place the number of the line next to "somewhat".

Somewhat_____

Now, using the number you assigned to "somewhat" as a standard, please assign a number to each of the other words below indicating each word's value relative to "somewhat". Again, use any number greater than, or equal to, zero (0). The number placed next to each word or phrase should reflect what you feel that word

or phrase means when compared with "somewhat". For example, if you assign a value of 50 to "somewhat" you might assign the value 100 to any other word or phrase which you feel represents twice the amount of importance as "somewhat", and a value of 5 to any word or phrase which seems to represent only 1/10 the amount of importance as "somewhat". You may use any whole or decimal number greater than zero (0), just as long as you feel it represents the numerical value of a word or phrase when that word or phrase is compared with "somewhat".

No	_____
A Moderate Amount of	_____
A Great Amount of	_____
Quite a Bit of	_____
An Extraordinary Amount of	_____
All	_____

The subjects of the research were undergraduate business students located in a major metropolitan area in the southeastern United States. The community, and the university, has a large Hispanic component.

It is recognized that there is some controversy over the use of student subjects in marketing research (Cunningham, Anderson and Murphy, 1974, Morgan, 1979). Their use in this study is justified by the following factors:

(i) in that the research employed a new (to marketing) methodology and thus was exploratory in nature
(ii) the use of business students isolated the cultural dimension of the study (the issue of interest) to the maximum extent in that it eliminated educational differences, a presumed source of variation in semantic quantification.

A total of 181 students participated in the study – 73 were Hispanic, 108 were non-Hispanic. The cultural assignment was made on the basis of "the primary language of your parents" with students with both parents native Spanish-speaking being labeled as Hispanic. The data was collected with an English language questionnaire.

Results

As noted earlier, the seven expressions of amount were chosen on the basis that they represented an equal-interval 7 point ratio scale. As a corollary this implied that there was an expected ordering of the values assigned to the expressions. Thus the initial data analysis involved non-parametric correlation of each subject's derived rank ordering of the seven stimuli with the predicted ordering. The results are displayed on Table 1. Spearman correlation was the nonparametric procedure utilized. Inspection of Table 1 indicates that the majority of students implicitly ordered the semantic stimuli consistently with expectations. However, it should be noted that Hispanic subjects showed a lesser propensity to order the expressions in the expected manner.

TABLE 1

CROSS-CULTURAL COMPARISON OF DERIVED ORDERINGS OF SEMANTIC STIMULI WITH EXPECTED ORDERING

Significance Level of Spearman Correlation Coefficient	Non-Hispanic	Hispanic	Total
$\leqslant$ .05	83.3%	68.5%	77.3%
$\geqslant$ .05	16.7%	31.5%	22.7%

The primary analysis was performed using a one-way multivariate analysis of variance (MANOVA). The program utilized was BMDX69 (Dixon, 1973). Using untransformed raw data as input, the non-significant multivariate F $(1.15, \text{d.f.} = 1, 7)$ representing the comparison of scale values assigned to the seven expressions of amount between the two cultural groups (Hispanic and non-Hispanic), was obtained. The mean scale values for each cultural group and the significance of the differences between cultural groups have been summarized in Table 2.

TABLE 2
MEANS OF EXPRESSIONS OF AMOUNT FOR UNTRANSFORMED DATA

Expression	$\overline{X}$ Hispanic	$\overline{X}$ non-Hispanic	Statistical Significance
Somewhat	18.77	11.23	$p < .05$
A Great Amount of	22.41	16.96	N.S.
Quite a Bit of	22.51	15.88	N.S.
An Extraordinary Amount of	26.74	20.43	N.S.
All	29.65	21.39	N.S.
No	2.41	2.15	N.S.
A Moderate Amount of	16.84	11.77	N.S.

The raw data were then transformed following the suggestion of Stevens (1975). Because different subjects might have chosen different anchor values for the referent concept (e.g., to one person might assign the value 10 to "somewhat", while to another "somewhat" might mean 100), the data was transformed so that each student's anchor value was the same, namely 50, and all other values were multiplied by the result. The multivariate F was again not significant. The transformed data has been summarized in Table 3.

TABLE 3
MEANS OF EXPRESSIONS OF AMOUNT FOR TRANSFORMED DATA*

Expression	$\overline{X}$ Hispanic	$\overline{X}$ non-Hispanic	Statistical Significance
Somewhat	50.00	50.00	N.S.
A Great Amount of	75.03	83.37	N.S.
Quite a Bit of	74.34	76.22	N.S.
An Extraordinary Amount of	102.32	108.06	N.S.
All	112.29	115.59	N.S.
No	10.30	9.18	N.S.
A Moderate Amount of	56.44	54.41	N.S.

$$*\text{Transformed expression} = \frac{50}{\text{Score (somewhat)}} \times \text{Score (expression)}$$

Discussion

The hypothesis of the study, namely that the assignment of quantitative values to a set of semantic stimuli was culture dependent was largely not supported. Neither multivariate analysis of variance and only one of the thirteen univariate analyses of variance exhibited a statistically significant difference. However the nonparametric Spearman correlations indicated some cultural

difference in semantic quantification, and inspection of Table 2 indicates that for all the expressions of amount the mean values for Hispanics were higher than those of non-Hispanics. It is possible that if the sample size was larger the differences might be statistically significant. In any event, the differences that the data display could potentially distort a study utilizing semantically defined scales. If a market research study were to utilize a scale value such as "somewhat important" and cross-cultural comparisons were desired the results of this research suggest that differences could be found based on cultural distinctions in the assessment of semantic meaning, as contrasted to the "true" differences that such investigation would be seeking. It should also be recognized that the homogeneous nature of the sample (excepting the cultural dimension) made the research a very strong test of the hypothesis.

The study described in this paper represents an exploratory attempt to explore an area of cross-cultural research which we believe is of great significance for international marketing research. A more extensive set of expressions of amount and the study of expressions of frequency ("always", "sometimes", "never") and evaluation ("excellent", "fair", "bad") would appear as avenues for future research. Of even more importance to cross-cultural research is the investigation of the language factor in semantic quantification. What quantitative impact is there in translating the English "always" to the Spanish "siempre"?

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