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Time Efficient Brand Image Measurement - Is Binary Format Sufficient to Gain the Market Insight Required?

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Abstract

Ordinal scales have become the most popular format in questionnaire design for marketing surveys (Van der Eijk, 2001) despite both (1) causing a number of methodological problems (Scharf, 1991; Peterson, 1997; Kampen & Swyngedouw, 2000) and (2) taking longer to answer (Dolnicar, 2003). The duration of the survey is especially critical in brand image surveys, where including one additional brand leads to as many additional questions as there are attributes along which the brands have to be evaluated. This study aims at gaining insight into the consequences of asking respondents to evaluate brand-attribute associations in ordinal of binary format. This is done from three perspectives: (1) a pure practitioners view, (2) by testing significance of differences in agreement with single brand-attribute combinations, and (3) by determining individual cut-off points and trying to predict the binary answers with the ordinal information.

Introduction

Measuring attitudes consumers have about brands represents the basis for both strategic and operational marketing decisions in branded industry. Such measurements usually take the form of brand-attribute combinations that are presented to the respondent who is then asked to state an agreement level regarding the association of the brand with the attribute. The construct measured in this way is in line with the definition of brand image by Keller (1993, p. 3): "perceptions about a brand as reflected by the brand associations in consumer memory".

Brand image measurement quality depends on numerous aspects of survey design, most importantly the careful selection of brands and attributes to be included. But also less central elements regarding the structure of the task. While there is extensive literature on these issues (Myers & Alpert 1968; Alpert, 1971; Wilkie & Weinreich, 1972; Boivin, 1986; Romaniuk & Driesener, 2002; Sharp & Romaniuk, 2002a), the aspect of the actual scale along which respondents are asked to answer has not been studied. This aspect is important because brand image surveys result in so-called three-way data sets. For instance, a respondent might be asked how s/he perceives Coca Cola regarding to a set of 10 attributes, including variables as "refreshing", "cool", "popular". Given the nature of three-way data sets respondents are confronted with large numbers of questions, making the concern on respondent fatigue crucial. Consequently it would be very attractive to find a way of reducing the amount of time respondents require to answer every single question in order to have more freedom in adding another attribute or brand without sacrificing data quality.

One possibility to reduce response time to single items is to switch from frequently used ordinal to binary answer format.

The aim of this study is to gain insight into the consequences of asking respondents to evaluate brand-attribute associations in ordinal of binary format. Three ways of evaluating these consequences are chosen: (1) a pure practitioners view is taken that centres around the interpretation of resulting brand profiles, (2) significance of differences in agreement with single brand-attribute combinations is tested, and (3) individual cut-off points are determined for each respondent and predictions are made about their binary answers given the ordinal information. The practical relevance lies in potential improvements in brand image measurement. If binary answers require less time and render essentially the same results, they should be preferred over ordinal scales.

Data

In his particular study a longitudinal approach was chosen. The motivation behind that was that the direct intra-individual comparison of the ordinal and binary findings was more essential and the potential distortion resulting from repeated measurement was estimated to be less crucial than the potential mistake made by comparing two random samples who answered the two questionnaire versions.

A convenience sample of undergraduate students from the University of Wollongong in Australia was exposed to two versions of the same three-way data questionnaire on fast food brands in two consecutive tutorials: a binary version and a six-point-scaled ordinal version. The questionnaire included six fast food chains and 11 attributes. In total, each respondent had to make 66 evaluations in each questionnaire. The usable sample size amounted to 148.

From prior investigations of the data set (Dolnicar, 2003) it is known that the duration of answering the two questionnaire versions differed significantly, with the binary version taking 4 minutes on average and the ordinal version 6 minutes. Also, it has been shown that the ordinal questionnaire was perceived as longer and more difficult to answer by the respondents.

Results

Do the brand profiles differ (the managerial perspective)?

Managers typically use average profiles of attributes for each brand to interpret brand image survey data. For binary data this values equal to the percentage of agreement among respondents. Assuming the same conditions as in the case of analysing ordinal data as cardinal data, the ordinal scale of 1 to 6 was transformed into equidistant intervals between 0 and 1 to make average values directly comparable.

Based on the profile inspections for all fast food brands, only one difference between answer formats are so strong that they would potentially lead to a different interpretation on the side of management: Red Rooster would under one condition be interpreted as spicy, but not under the second one.

Do the brand-attribute associations differ significantly?

Paired sample *t*-tests were conducted on all pairs of brand-attribute evaluations. In the case of assuming complete homogeneity in the market (assuming that each individual is expected a priori to have the same brand-attribute associations), 37 out of 66 attribute brand combinations render significantly different values (56 %) although only one such combination dramatically influences the brand image interpretation based on the profile, as stated above. When the tests are Bonferroni-corrected (accounting for 66 statistical tests on vthe same data set) none of them are significant.

If it is assumed that brand-attribute associations vary in dependence of the fact which fast food brand students favour even the non-Bonferroni-corrected number of significant tests decreases to 19.

All in all, this supports the findings from visual inspection that – assuming essentially cardinal properties of the ordinal scale – the findings do not differ significantly.

Can binary answers be predicted by ordinal answers?

Another approach of testing the consequences of different answer formats is to investigate whether every single respondent's answers can be transformed from one scale to the other. In this case, the ordinal information is used to first identify individual cut-off points (thus taking into account heterogeneity in scale usage) that determine for each student which ordinal scale values are transformed into a) and which ones into a 1 into a 1 on the binary scale. These cut-off values are determined by minimizing the prediction error. Figure 1 shows the distribution of the individual cut-off values determined. As can be seen, the cut-off value of 4, indicating the middle of the ordinal scale, rendered optimal predictions for more than 60 respondents thus representing the most frequently appropriate cut-off level for the data set at hand.

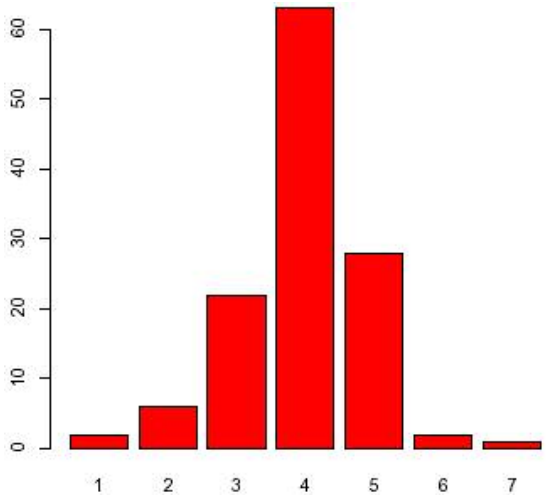

Figure 1: Optimal cut-off points

Next, individual-level predictions are made and analysed. The quality of predictions was evaluated by computing the precision. Precision of "no" gives the number of correctly predicted "no" responses divided by the number of real "no" answers in the binary data set

per person. The histogram of achieved precision for both the negative and positive brand-attribute associations is provided in Figure 2.

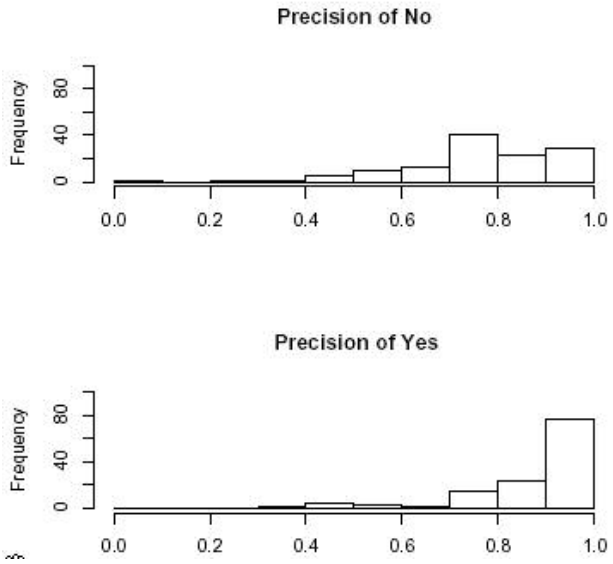

Figure 2: Precision of predictions

It can be seen from Figure 2 that the agreement with brand-attribute combinations (the 1's in the binary data set) were predicted with a higher precision than the non-associations (0's). The overall precision for "no" is 0.76, and 0.90 for "yes". If instead of individual cut-off values, one general cut-off value (4) is used for all respondents, the average precision amounts to 0.70 and 0,90. In this case 85 respondents have a precision between 0.9 and 1 and another 40 between 0.8 and 0.9.

Table 1 gives all precision values separately for the fast food brands and the attributes.

Table 1: Precision for fast food brands and attributes

	BurgerKing	KFC	McDonalds	PizzaHut	RedRooster	Subway
1	0.92	0.91	0.93	0.89	0.88	0.86
0	0.75	0.73	0.82	0.68	0.69	0.69
	cheap	convenient	disgusting	expensive	fast	fattening
1	0.93	0.93	0.78	0.76	0.94	0.94
0	0.58	0.39	0.76	0.74	0.49	0.52
	healthy	spicy	tasty	yummy	greasy	
1	0.82	0.67	0.90	0.89	0.93	
0	0.91	0.85	0.63	0.66	0.63	

Conclusions and future work

The findings from this preliminary study with a student sample indicate that there is little variation between brand profiles resulting from binary and ordinal answer formats. Furthermore, the predication rate of the binary answers based on the ordinal answers indicates that respondents do have identifiable transformations between the two scales. And if only full agreement is relevant from the managerial perspective, than very little relevant information is lost by using binary brand image survey questionnaires. From these results – which are clearly limited in generalisability at this stage – is can be recommended to use binary answer format instead of ordinal format for brand image measurement, unless information of the kind that" 15 percent slightly associate an attribute with a brand" are really of importance to management. By using binary scales, respondents' perceptions of difficulty are reduced as well as the actual duration of the survey, which consequently leads to lower fieldwork expenses.

Future work should replicate the study using a representative sample of the population or users of a particular branded product category. Also, an investigation among marketing managers would be interesting to determine how often frequency distributions over all ordinal categories are actually used. To the authors' knowledge managerial interpretations are based on means, and the binary answer format is clearly sufficient to provide these same numbers at lower cost and lower effort on the part of the respondents.

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