The Accuracy of the Juster Scale for Predicting Purchase Rates of Branded, Fast-Moving Consumer Goods

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This paper examines the suitability of the Juster Scale for predicting demand for different brands of fast moving consumer goods, within two product categories. The products used in the study were three brands of canned soup (Watties, Campbells and Heinz), and four brands of yoghurt (Ski, Yoplait, Fresh and Fruity, and No-Frills). The purchase probability data was obtained from the 1992 Palmerston North Household (face-to-face) Omnibus survey. Respondents were reinterviewed by telephone, four weeks after the omnibus survey to obtain recalled estimates of actual purchases. The Juster scale overestimated purchases, both for product categories and for brands. Purchase rates for soup were overestimated by 5% and for yoghurt by 6%. The overestimate for individual brands were slightly larger; the average over all 7 brands being 8%.Although the accuracy of the predictions of purchase rates was disappointing, the predictions of brand share were more accurate. This study has demonstrated that it is possible to obtain quite accurate estimates of market share for branded products using the Juster Purchase Probability Scale, as well as accurate estimates of the purchase rate for each brand.

Keywords: Juster Scale, purchase probabilities, intentions, estimates

Introduction

Dissatisfied with the accuracy of predictions of purchase behaviour based on socio-economic and demographic variables, attitudes, and purchase intentions, researchers in the 1960's shifted their attention to purchase probabilities. This led to the development of a purchase probability scale, commonly known as the Juster Scale (Juster 1966).

Although various forms of the Juster Scale have been used (see Day, Gan, Gendall & Esslemont 1991, for a review), the "standard" form consists of an eleven point numerical scale, ranging from 0 to 10, each point associated with both a verbal and a numerical probability statement (Juster 1966).

This scale (see Figure 1) has been used to predict purchase rates for a range of items, in different product classes (durables, services and fast moving consumer goods), over various time periods. In all cases, the Juster Scale has proved to be a better predictor than purchase intention scales, although the accuracy of prediction has varied considerably for different types of goods or services (Juster 1966, 1969; Gruber 1970; Heald 1970; Clawson 1971; Gabor & Granger 1972/73; Pickering & Isherwood 1974; Isherwood & Pickering 1975; Gan, Esslemont & Gendall 1985; Gendall, Esslemont & Day 1991).

The Juster Scale, with one exception, has been applied to product categories rather than brands. U, Esslemont and Brennan (1991), who were primarily concerned with estimating purchase quantities, used three branded products in three separate product categories. This paper reports the findings of a study that investigated the suitability of the Juster Scale for predicting demand for different brands of fast moving consumer goods within two product categories.

Figure 1. The Juster Purchase Probability Scale

10	Certain, practically certain	(99 in 100)
9	Almost sure	(9 in 10)
8	Very probable	(8 in 10)
7	Probable	(7 in 10)
6	Good possibility	(6 in 10)
5	Fairly good possibility	(5 in 10)
4	Fair possibility	(4 in 10)
3	Some possibility	(3 in 10)
2	Slight possibility	(2 in 10)
1	Very slight possibility	(1 in 10)
0	No chance, almost no chance	(1 in 100)

Method

The purchase probability data for this study was obtained from the 1992 Palmerston North Household Omnibus survey. This is an annual project conducted by the Department of Marketing, Massey University. The survey covers households within the Palmerston North city boundary, and is based on clusters of four interviews (two with males, two with females, 15 years of age or older) around randomly selected starting points. Substitutions were made for households where an interview was refused or households where no contact could be made with the respondent after three attempts. The response rate was 55%; there were 417 completed interviews.

At the end of the interview, respondents were asked for their consent to be re-interviewed; no indication was given as to the subject of the further research. The re-interviews were conducted by telephone, four weeks after the omnibus survey, by professional interviewers; 239 respondents were successfully re-interviewed (90% of those who agreed to be re-interviewed).

The products used in the study were three brands of canned soup (Watties, Campbells and Heinz), and four brands of yoghurt (Ski, Yoplait, Fresh and Fruity, and No-Frills).

Procedure

Before obtaining the purchase probability data for the soup and yoghurt, respondents were introduced to the Juster Scale in the manner used by Juster (1966), using the prospects of shifting house as a practice exercise. The respondents were then asked about their prospects of buying a can of soup, and of buying specified brands of soup.

> *"Taking everything into account, what are the prospects that you personally will buy at least one can of soup some time within the next four weeks; that is, between now and the end of May?" RECORD RESPONSE. ASK THE FOLLOWING QUESTIONS TO RESPONDENTS WHO GIVE A PROBABILITY GREATER THAN ZERO.*

"I now want you to consider three brands of canned soup: Watties, Heinz, and Campbells."

"What are the prospects that you personally would buy one or more cans of <Watties> soup in the next four weeks?" RECORD RESPONSE

This process was repeated for the two other brands of soup and the four brands of yoghurt.

Results

The Juster scale overestimated purchases, both for product categories and for brands (see Table 1). Purchase rates for soup were overestimated by 5% and for yoghurt by 6%. The overestimate for individual brands were slightly larger; the average over all 7 brands being 8%.

Table 1. Predicted and actual purchase rates

	Predicted		Actual		Error of Prediction
	%	n	%	n	%
Soup	27.8	66	23.0	55	+4.8
Watties	26.9	64	15.9	38	+11.0
Campbells	10.4	25	4.6	11	+5.8
Heinz	9.0	22	4.6	11	+4.4
Total		111		60	
Yoghurt	49.0	117	42.7	102	+6.3
Fresh & Fruity	36.2	87	22.6	54	+13.6
Yoplait	27.1	65	15.9	38	+11.2
Ski	20.5	49	14.6	35	+5.9
No Frills	5.6	13	0.8	2	+4.8
Total		214		129	
Mean absolute error over all brands	8.1				

Note. n = 239

Although the accuracy of the predictions of purchase rates was disappointing, the predictions of brand share were more accurate (see Table 2). Since respondents at the reinterview were asked only whether they had bought the brand, and not how much they had bought, "brand share" here represents the number of people buying the brand divided by the sum, over all brands, of the number of people buying each brand. Thus for canned soup, for example, 55 people bought soup but some bought more than one brand, and the number buying Watties,

plus the number buying Campbells, plus the number buying Heinz is 60 (see Table 1). Brand share for canned soup is calculated as the number buying the brand divided by 60.

The mean absolute error of prediction of market share, calculated in this way, was only 3.1%. This, together with the fact that predictions of purchase of product categories were more accurate than predictions of purchase of brands, suggests an alternative method of predicting the number buying each brand.

Table 2. Predicted and actual brand share[1] of purchasers

	Predicted brand share	Actual brand share	Error of Prediction
	%	%	%
Soup	**(n=111)**	**(n=60)**	
Watties	58.1	63.3	-5.2
Campbells	22.5	18.3	+4.2
Heinz	19.4	18.3	+1.1
Total	100.0	100.0	
Yoghurt	**(n=214)**	**(n=129)**	
Fresh & Fruity	40.5	41.9	-1.4
Yoplait	30.3	29.5	+0.8
Ski	22.9	27.1	-4.2
No Frills	6.3	1.6	+4.7
Total	100.0	100.0	
Mean absolute error over all brands	3.1		

Note. n = 239

1. In this context, the "brand share" refers to the proportion of total purchasers who purchased a particular brand.
2. Based on predicted number of buyers calculated to three decimal places, not rounded.

The number buying a brand can be predicted by multiplying the predicted brand share by the predicted number of purchasers of the product category. For example, it was predicted that 66 people (actually, 66.442) would buy canned soup (see Table 1), and the predicted brand share for Watties was 58.1%, so the predicted number of people who would buy Watties is (58.1 * 66)/100 = 38.6. The results of this procedure are shown in Table 3.

The errors in predicted purchases for brands using this new method are clearly much smaller than for the original method. There appears not to be a tendency towards consistent overestimation, and the mean absolute error over all brands is only 1.7%, compared to 8.1%.

Table 3. Predicted and actual purchase rates using new method

	Predicted brand share	Predicted buyers		Actual buyers		Error of Prediction
	%	n	%	n	%	%
Soup	(n=66)					
Watties	58.1	38.6	16.2	38	15.9	+0.3
Campbells	22.5	14.9	6.3	11	4.6	+1.7
Heinz	19.4	12.9	5.4	11	4.6	+0.8
Yoghurt	(n=117)					
Fresh & Fruity	40.5	47.4	19.9	54	22.6	-2.7
Yoplait	30.3	35.5	14.9	38	15.9	-1.0
Ski	22.9	26.8	11.2	35	14.6	-3.4
No Frills	6.3	7.4	3.1	2	0.8	+2.3
Mean absolute error over all brands	1.7					

Conclusion

This paper reports on an exploratory study, involving only two sets of branded products, and a small sample size. Even so, the results of this study are very promising, and suggest that further investigation and validation of the technique used is in order.

This study has demonstrated that it is possible to obtain quite accurate estimates of market share for branded products using the Juster Purchase Probability Scale, as well as accurate estimates of the purchase rate for each brand. The recommended procedure is to use the Juster Scale to obtain purchase probabilities for each of the major brands in a product category, as well as for the brand category itself. From this data, one can then estimate both brand share and brand purchase rates.

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