

Using the Best-Worst method to examine market segments and identify different influences of consumer choice

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Abstract

Wine marketers use market segmentation to target different products to different segments in order to increase sales, often with little evidence about what influences choice within or between segments. In this paper we provide initial results using a relatively new and very straightforward method for measuring consumer preferences. The best-worst scaling method (also called max-diffs) simply asks consumers to look at sets of products, attributes, or other factors to be compared and choose from each set the best/most favourable and the worst/least favourable. A simple count and manipulation results in a single preference scale, where the differences may be compared as distances rather than rank order. This paper shows how segmenting the consumers using factors such as gender, frequency of consumption, wine involvement and age produce segments with similar preferences for different varietal wines. Two country examples are used, Israel and Australia, to show the ability of the Best-Worst method to develop 'maps' of segments across markets based on patterns of choice. The goal of this paper is to demonstrate the practical and a scholarly usefulness of this approach and to show the method for a larger cross-national study across major wine consuming markets.

Introduction

Understanding what product features drive consumer choice is necessary for developing marketing and segmentation. Choice modeling provides a means to understand consumer preferences for product attributes and is much more predictive of actual marketplace choices than standard hedonic scaling (Lockshin and Hall 2003; Lockshin et al. 2006; Louviere et al. 2000). However, choice modeling confounds the scale and size of the utilities and therefore is not suitable for making comparisons among different data collections (Louviere et al. 2000). Finn and Louviere first published the Best-Worst method in 1992 and recently proved the ability of the method to provide unbiased estimates across different data collections (Marley and Louviere 2005). Best-Worst scaling produces much less method variance than hedonic scaling and thus results in better separation among various alternatives. A literature review is beyond the scope of this paper, the focus here is to present results to demonstrate the direction of the research and initial findings. For a literature review, see the paper published earlier using this method in the wine sector (Goodman, Lockshin, Cohen 2005), which gives a review not just of the Best-Worse method but also of classical choice modeling approaches. Goodman, Lockshin and Cohen introduced the method to the wine sector in 2005, which showed that it was easily applicable to measuring style preferences for wine in both Australia and Israel. This paper extends their work by utilizing the data from two countries and shows the ease of using this method to test for evidence of segmentation. We use two demographic and two psychographic measures to illustrate the method. The four variables were all significant in previous examinations of consumer choice for wine (Lockshin et al 2006; Perrouy et al 2005).

Method

We collected data in Israel and Australia. The Australian data were collected in Australia among participants in several wine seminars in Adelaide and Perth during 2004. There were 145 valid

responses from Australia. The other set was collected in Israel in 2005 where there were 130 valid questionnaires. In both studies, we presented 11 choices in 12 different choice sets, using the design developed by Finn and Louviere (1992), with further details discussed in Goodman, Lockshin and Cohen (2005). In the Australian data collection, respondents were presented with a BW selection set, consisting of 11 choices of 9 different wine varieties and 2 attributes of 'particular region' and 'well known brand'. The Israel data consisted of 11 wine varieties. In both studies respondents were asked to choose which varietal they 'best' preferred and which one they 'least' preferred from each choice set. The two sets of data differ fundamentally in the demographic breakdowns of respondents (Table 1), so true comparisons are not possible, but the fact that segments can be determined even within these disparate groups shows the usefulness of the technique. For further research to better compare and 'map' profiles it will be necessary to develop strict protocols involving quotas on income, gender, wine involvement, age and frequency if indeed these are the demographics of interest.

The BW score (level of importance) for each attribute (wine) is calculated by subtracting the frequency of worst/least from the frequency of best/most of the same attribute, for each interviewee over all choice sets. The overall level of importance for an attribute (wine) for all respondents was determined by summing the BW scores of each wine for all respondents. Since the level of importance of each attribute depends on the number of respondents and in the frequency that each attribute appears in the choice sets, a standard score was derived as follows:

$$Z_j = \frac{BWscore_j}{MaxBW - MinBW}$$

Where:

Z_j is the standard level of importance of attribute j

j is the attribute number ($j=1, \dots, n$; for the current design $n=11$)

$BWscore_j$ is the total Best-Worst frequency for attribute j over all respondents ($i=1, \dots, m$)

$MaxBW$ is the highest frequency of Total Best-Worst over all attributes ($MaxBWscore_j, j=1, \dots, n$)

$MinBW$ is the lowest frequency of Total Best-Worst over all attributes ($MinBWscore_j, j=1, \dots, n$)

The level of importance (Best-Worst or $BWscore_j$) of each attribute and respondents was used for the statistical analysis (ANOVA, t-test). When differences exist among the means in the Analysis of Variance, pairwise multiple comparisons of means (LSD, least significant difference, at $p < 0.05$ significance level) were applied to test the difference between each pair of means.

For the 'involvement' segmentation, involvement was based on 3 questions describing the respondent's behavior concerning wine (Lockshin et al. 1997). Respondents were classified in two categories: "high involved" and "low involved". The sum of scores of 3 questions defined the classes where a score above 10 (the median value of the sum of scores) was classified as "high involved" and 10 or below was classified as "low involved".

Results

The results presented here are from initial studies undertaken to investigate and demonstrate the method and its application within the wine industry, especially to see if it would be possible to map the influences of consumer choice using this approach. As discussed above, the Australian data is

skewed towards highly involved wine consumers and generalizations at this stage are premature as a larger sampling of low involvement wine consumers needs to be included in the data set to give a more representative sample. Table 1 shows the response by category in both markets and highlights the need in future collaboration to establish quotas for data collection.

Table 1 - Response by Category

Survey →		Israel	Australia
	# of respondents	130	145
Gender	Male	72	85
	Female	58	60
Age	18-24	20	8
	25-40	91	56
	41-55	15	58
	>55	4	23
Income	Below average	99	23
	About average	24	14
	Above average	7	103
Employment	Full time working	19	103
	Part-time working	103	19
	Self-employed	7	15
	Unemployed/ retired	1	7

Israeli Wine Varietal Preference

Before applying the segmentation to the data, it is necessary to examine each market as a whole to see the resultant ‘rankings’ of what variety is preferred. Using Least Significant Difference (LSD) we can see the statistically similar groups that emerge within the segmented data (Table 2). We use LSD throughout the segmentation approach to see what different groups emerge as various segmentation schemes are applied and compared back to the full data set.

Table 2 - Variety preference of wine Israel (n=130), Best-Worst Scaling (LSD p<0.05) - Israel

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups
5 Cabernet Sauvignon	269	0.494	X
7 Merlot	223	0.410	X
10 Emerald Riesling	130	0.239	X
8 Chardonnay	107	0.197	X X
9 Sauvignon Blanc	73	0.134	X X X
11 Muscat	36	0.066	X X
6 Shiraz	4	0.007	X
3 Rose	-153	-0.281	X
4 Red house wine	-174	-0.320	X X
1 White house wine	-240	-0.441	X X
2 Sparkling wine	-275	-0.506	X

Gender

Using gender to sort the data we can see (Column 1 Tables 3 & 4) that Males prefer Cabernet Sauvignon and Females prefer Merlot, Males prefer Chardonnay and Emerald Riesling over

Sauvignon Blanc, whilst Females prefer Emerald Riesling over Sauvignon Blanc and Chardonnay but prefer Sauvignon Blanc to Chardonnay. Males prefer Shiraz to Muscat, whilst females have the opposite preference, both least prefer Rose, Red house wine, White house wine and Sparkling wine in the same order. Whilst this can provide a simple ‘map’ we do not know if any of this ranking is of any statistical significance and must take a further step to do so.

Table 3 - Male preferences for Wine Varietal (n=72) - Israel

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups			
5 Cabernet Sauvignon	166	0.524	X			
7 Merlot	106	0.334	X			
8 Chardonnay	67	0.211	X	X		
10 Emerald Riesling	54	0.170	X	X	X	
9 Sauvignon Blanc	30	0.095		X	X	
6 Shiraz	16	0.050		X	X	
11 Muscat	1	0.003			X	
3 Rose	-80	-0.252				X
4 Red house wine	-83	-0.262				X
1 White house wine	-126	-0.397			X	X
2 Sparkling wine	-151	-0.476				X

Table 4 - Female Preference for Wine Varietal Female (n=58) - Israel

Variety	Best-Worst Frequency	Level of importance Standard score	Similar groups			
7 Merlot	117	0.485	X			
5 Cabernet Sauvignon	103	0.427	X			
10 Emerald Riesling	76	0.315	X	X		
9 Sauvignon Blanc	43	0.178		X		
8 Chardonnay	40	0.166		X		
11 Muscat	35	0.145	X	X		
6 Shiraz	-12	-0.050		X		
3 Rose	-73	-0.303				X
4 Red house wine	-91	-0.378			X	X
1 White house wine	-114	-0.473			X	X
2 Sparkling wine	-124	-0.515				X

Consumption Frequency

When sorting by consumption frequency, there is very little difference in the ranking order (Column 1 Tables 5 & 6). There are only two differences, with higher frequency drinkers (more than once a week) ranking Muscat as the fifth most preferred compared with lower frequency rating it at number seven, and high frequency drinkers least preferring Sparkling Wine more than White house wine, the opposite of lower frequency consume.

Table 5 - Low Frequency Drinkers (Wine once a week or less) (n=48) - Israel

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups		
5 Cabernet Sauvignon	128	0.533	X		
7 Merlot	92	0.383	X		
10 Emerald Riesling	44	0.183		X	
8 Chardonnay	37	0.154		X	
9 Sauvignon Blanc	29	0.121		X	
6 Shiraz	13	0.054	X	X	
11 Muscat	-21	-0.088		X	X
3 Rose	-50	-0.208			X
4 Red house wine	-61	-0.254		X	X
2 Sparkling wine	-99	-0.413			X X
1 White house wine	-112	-0.467			X

Table 6 - High Frequency Drinkers (Wine more than once a week) (n=82) - Israel

Variety	Best-Worst Frequency	Level of importance Standard score	Similar groups		
5 Cabernet Sauvignon	141	0.445	X		
7 Merlot	131	0.413	X		
10 Emerald Riesling	86	0.271	X	X	
8 Chardonnay	70	0.221		X	
11 Muscat	57	0.180		X	
9 Sauvignon Blanc	44	0.139		X	X
6 Shiraz	-9	-0.028		X	
3 Rose	-103	-0.325			X
4 Red house wine	-113	-0.356			X
1 White house wine	-128	-0.404			X X
2 Sparkling wine	-176	-0.555			X

Involvement

Involvement, one of the most used methods of separating wine drinkers preferences (Lockshin et al 1997; Lockshin et al 2001; Lockshin et al 2006; Quester and Smart 1998; Zaichowsky 1985) shows some differences in the Israeli wine market. We can see different patterns of 'preferred groups of varieties' beginning to emerge (Tables 7 and 8). Low involved wine drinkers have a top preference group that includes Merlot, Cabernet Sauvignon and Emerald Riesling, the same order and grouping as the Female segment and the same grouping as the high frequency segment. High involvement consumers, similar to the male segment, have Cabernet Sauvignon as the sole most preferred wine varietal, with Merlot and Emerald Riesling as the second most preferred group

Table 7 - Low Involved Wine Drinkers (n=65) - Israel

Variety	Best-Worst Frequency	Level of importance Standard score	Similar groups		
7 Merlot	122	0.504	X		
5 Cabernet Sauvignon	111	0.459	X		
10 Emerald Riesling	82	0.339	X	X	
8 Chardonnay	49	0.202		X	X
9 Sauvignon Blanc	32	0.132		X	X
11 Muscat	24	0.099		X	X
6 Shiraz	-8	-0.033			X
3 Rose	-80	-0.331			X
4 Red house wine	-97	-0.401			X
1 White house wine	-115	-0.475			X
2 Sparkling wine	-120	-0.496			X

Table 8 - High Involved Wine Drinkers (n=65) - Israel

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups		
5 Cabernet Sauvignon	158	0.505	X		
7 Merlot	101	0.323		X	
8 Chardonnay	58	0.185		X	X
10 Emerald Riesling	48	0.153		X	
9 Sauvignon Blanc	41	0.131		X	
6 Shiraz	12	0.038		X	
11 Muscat	12	0.038		X	
3 Rose	-73	-0.233			X
4 Red house wine	-77	-0.246			X
1 White house wine	-125	-0.399			X
2 Sparkling wine	-155	-0.495			X

This paper has demonstrated that simple group comparison techniques, such as LSD can show to what extent the preferences are different between the segments. In many cases there are two or three varietals that form the ‘second’ most preferred group. In order to see if the segmentation has any empirical substance, we conducted a simple t-test of the difference between the two segments for each varietal. For the Israeli data the results of these t-tests are shown in Table 9. We can see that the gender segment has statistically significant differences in terms of preference for Shiraz ($p < 0.05$) and the wine involvement segment has a significant difference in preference for Cabernet Sauvignon ($p < 0.10$). Cabernet Sauvignon and Muscat (both at $p < 0.05$) are both statistically different between frequent and infrequent wine drinkers even though their rank order is similar. This analysis showed the mechanism for comparing demographically derived segments, but the small sample size reduced the statistical significance of the results.

Table 9 - T-Test Analysis between Two Segments - Israel

Variety	Gender	Frequent drink Wine	Wine Involvement
1 White house wine			
2 Sparkling wine			
3 Rose			
4 Red house wine			
5 Cabernet Sauvignon		**	*
6 Shiraz	**		
7 Merlot			
8 Chardonnay			
9 Sauvignon Blanc			
10 Emerald Riesling			
11 Muscat		**	

* Significant at $p < 0.10$; ** significant at $p < 0.05$

Australian Wine Varietal Preference

The Australian choice set replaced 2 varieties with the choices of ‘brand’ and ‘region’. Whilst this may not be included in replications, it was done so to enable an examination of fit with previous literature that shows the importance in the Australian setting of ‘region’ and ‘brand’ (see Hall and Lockshin 2000; Goodman, Lockshin and Cohen 2005 for more discussion). In line with market share, Shiraz was the most preferred, followed by Cabernet Sauvignon. Supporting other research (Hall and Lockshin 2000) was the fact that ‘premium region’ was the third most important attribute when choosing varietal wine, and using LSD (Table 10) the top three are all preferred as much as the wine from a premium region and wine from a well-known brand. Interestingly, Sauvignon Blanc is preferred more than Chardonnay, which is in contrast to the market shares of these varieties, but in line with the growth rates of sales in Australia.

Table 10 – Variety Preference of Wine (n=145), Best-Worst Scaling (LSD $p < 0.05$) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups
6 Shiraz	255	0.344	X
5 Cabernet Sauvignon	243	0.328	X X
11 Wine from a premium Region	233	0.314	X X
7 Cabernet/Merlot	178	0.240	X X
10 Wine from a well known brand	172	0.232	X X
9 Sauvignon Blanc	129	0.174	X X
8 Chardonnay	71	0.096	X
2 White sparkling wine	-235	-0.317	X
3 Rose	-263	-0.355	X
4 Red house wine	-297	-0.401	X
1 White house wine	-486	-0.656	X

Gender

A quick examination of the Australian data shows that mapping by gender may show quite different preferences in several aspects (Column 1 Tables 11 and 12). Firstly only the lowest 5 have similar rankings, the only exception being that of red wine and rose swap places. The most preferred

attribute for male respondents is in line with market share (Shiraz and Cabernet) followed by 'region' and 'brand', whilst for females in this sample 'region' is the most important attribute when choosing wine, followed by Cabernet Merlot and Sauvignon Blanc, which are in stark contrast to their market share. Females rank brand as marginally being a 'best' option (only slightly more mentions as best as opposed worst). At first glance this appears to support 'females' being a segment to target for niche markets as they appear to have preferences for attributes that are not big market shares. It is necessary to use LSD to investigate. When applying LSD to the data segmented by gender (Tables 11 and 12) shows that males have a specific preference for Shiraz and Cabernet Sauvignon, while females have a much broader range of grape varieties and wine attributes with no significant differences between them. This may partially be due to the relatively small sample size in this subgroup or it may indicate quite different choice processes between men and women.

Table 11 - Male preference for Wine (n=85) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups			
6 Shiraz	198	0.381	X			
5 Cabernet Sauvignon	181	0.348	X			
11 Wine from a premium Region	150	0.288	X	X		
10 Wine from a well known brand	129	0.248		X		
7 Cabernet/Merlot	102	0.196		X	X	
9 Sauvignon Blanc	56	0.108			X	X
8 Chardonnay	34	0.065			X	X
4 Red house wine	-149	-0.287				X
2 White sparkling wine	-175	-0.337				X
3 Rose	-204	-0.392				X
1 White house wine	-322	-0.619				X

Table 12 - Female preference for Wine (n=60) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups			
11 Wine from a premium Region	83	0.336	X			
7 Cabernet/Merlot	76	0.308	X			
9 Sauvignon Blanc	73	0.296	X			
5 Cabernet Sauvignon	62	0.251	X			
6 Shiraz	57	0.231	X			
10 Wine from a well known brand	43	0.174	X			
8 Chardonnay	37	0.150	X			
3 Rose	-59	-0.239		X		
2 White sparkling wine	-60	-0.243		X		
4 Red house wine	-148	-0.599			X	
1 White house wine	-164	-0.664			X	

Frequency of Consumption

There are some key differences in ranking order between High and Low frequency wine consumption groups (Column 1 Tables 13 & 14) in this initial data. High frequency wine drinkers are most influenced by 'premium region' and prefer Cabernet Sauvignon, Shiraz, brand and Sauvignon Blanc over Cabernet Merlot. The lower score for Cabernet Merlot in this group is quite

distinct from the ranking of the whole sample. The other key difference between the two rankings is that high frequency wine drinkers prefer Sauvignon Blanc to Chardonnay, against the market shares, whereas Low frequency wine drinkers prefer Chardonnay to Sauvignon Blanc.

As with the data presented previously, applying LSD gives insight into the importance, or 'difference' in the rankings. Both segments show similar patterns (Tables 13 and 14) to the whole sample, such as both preferring Shiraz as their top choice. Low frequency wine drinkers like Cabernet/Merlot as the preference is included in their top choice, whereas high frequency drinkers place this in their second tier. High frequency wine drinkers also differ to the whole sample as their preference for 'brand' is important enough to be included in their group's top grouping. High frequency wine drinkers seem to have more defined preferences with few overlaps. They focus on top varieties, Shiraz and Cabernet and wine from a premium region. While the lower frequency drinkers have these in their preferences, but in a much more diffuse way. This may be due to the smaller sample size of this group or may indicate a true difference in how they choose wines.

Table 13 - Low Frequency Drinkers (Wine once a week or less) (n=41) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups
6 Shiraz	79	0.391	X
7 Cabernet/Merlot	65	0.322	X X
5 Cabernet Sauvignon	63	0.312	X X
11 Wine from a premium Region	47	0.233	X X X
10 Wine from a well known brand	32	0.158	X X
8 Chardonnay	16	0.079	X
9 Sauvignon Blanc	15	0.074	X
3 Rose	-43	-0.213	X
4 Red house wine	-74	-0.366	X
2 White sparkling wine	-77	-0.381	X
1 White house wine	-123	-0.609	X

Table 14 - High Frequency Drinkers (Wine more than once a week) (n=104) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups
11 Wine from a premium Region	186	0.339	X
5 Cabernet Sauvignon	180	0.328	X
6 Shiraz	176	0.321	X
10 Wine from a well known brand	140	0.255	X X
9 Sauvignon Blanc	114	0.208	X X
7 Cabernet/Merlot	113	0.206	X X
8 Chardonnay	55	0.100	X
2 White sparkling wine	-158	-0.288	X
3 Rose	-220	-0.401	X
4 Red house wine	-223	-0.406	X
1 White house wine	-363	-0.661	X

Involvement

The involvement segment gives fewer differences when comparing the rank orders to the order of the sample (Column 1 Tables 15 & 16). There are only minor differences in rank order, high

involved consumers have Cabernet Sauvignon above Shiraz and low involved wine consumers have 'region' above Cabernet Sauvignon. Finally, low involved wine consumers prefer Sauvignon Blanc to Chardonnay, the opposite to high involved wine consumers. Tables 15 and 16 demonstrate that there are differences when comparing the two involvement levels to the whole to the sample. Low involved drinkers are more homogeneous with their choices. They have Cabernet/Merlot and 'brand' included in their top group of influencers and do not have a common grouping of preference for Sauvignon Blanc and Chardonnay, inferring they really do prefer Sauvignon Blanc to the market leading Chardonnay, in contrast to the whole sample that has a similar group for both. The high involved segment shows a similar pattern to the sample, with only minor variations that has Sauvignon Blanc appear in only the fourth most important group, whereas the sample has a grouping where it appears in the third group. Interestingly is that this variable shows less distinguishing features than the use of consumption frequency. Again, this may be due to the lopsided sample having more high involvement buyers.

Table 15 - Low Involved Wine Drinkers (n=83) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups
6 Shiraz	138	0.329	X
11 Wine from a premium Region	135	0.322	X X
5 Cabernet Sauvignon	122	0.291	X X
7 Cabernet/Merlot	106	0.253	X X
10 Wine from a well known brand	100	0.239	X X
9 Sauvignon Blanc	78	0.186	X
8 Chardonnay	8	0.019	X
2 White sparkling wine	-110	-0.263	X
3 Rose	-133	-0.317	X
4 Red house wine	-163	-0.389	X
1 White house wine	-281	-0.671	X

Table 16 - High Involved Wine Drinkers (n=62) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups
5 Cabernet Sauvignon	121	0.371	X
6 Shiraz	117	0.359	X X
11 Wine from a premium Region	98	0.301	X X X
7 Cabernet/Merlot	72	0.221	X X X
10 Wine from a well known brand	72	0.221	X X X
8 Chardonnay	63	0.193	X X
9 Sauvignon Blanc	51	0.156	X
2 White sparkling wine	-125	-0.383	X
3 Rose	-130	-0.399	X
4 Red house wine	-134	-0.411	X
1 White house wine	-205	-0.629	X

Age

The data collected in Australia enables a segmentation of the data using the 'age' variable. Rankings of each segment (Column 1 Tables 17 & 18) are somewhat similar to the overall sample with minor variations. Those wine drinkers aged 40 years and under prefer region to Cabernet

Sauvignon than the whole sample and have a better preference for Rose than the whole sample, whilst those over 40 years prefer Cabernet Sauvignon to Shiraz, and both of the varieties to a premium region. They also have a lower preference for Rose than the sample. Use of LSD shows (Table 17 and 18) that wine drinkers over 40 have fewer differences in their preferences than the total sample. The top five attributes can all be said to be in the top group of most important attributes, whereas the sample only has three. The groupings that emerge using LSD for wine drinkers under 40 shows a similar pattern to the sample, although at the lower end of positive 'best' preferences there is a larger grouping of commonality whereas the sample tails out more abruptly.

Table 17 - Wine Preferences Age 40 years or under (n=64) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups
6 Shiraz	123	0.370	X
11 Wine from a premium Region	110	0.331	X X
5 Cabernet Sauvignon	95	0.286	X X X
7 Cabernet/Merlot	66	0.199	X X X
10 Wine from a well known brand	60	0.181	X X
9 Sauvignon Blanc	59	0.178	X X
8 Chardonnay	31	0.093	X
3 Rose	-89	-0.268	X
2 White sparkling wine	-98	-0.295	X
4 Red house wine	-148	-0.446	X
1 White house wine	-209	-0.630	X

Table 18 - Wine Preferences Age >40 (n=91) - Australia

Variety	Best-Worst frequency	Level of importance Standard score	Similar groups
5 Cabernet Sauvignon	148	0.348	X
6 Shiraz	132	0.311	X
11 Wine from a premium Region	123	0.289	X X
7 Cabernet/Merlot	112	0.264	X X
10 Wine from a well known brand	112	0.264	X X
9 Sauvignon Blanc	70	0.165	X X
8 Chardonnay	40	0.094	X
2 White sparkling wine	-137	-0.322	X
4 Red house wine	-149	-0.351	X
3 Rose	-174	-0.409	X
1 White house wine	-277	-0.652	X

Using simple t-tests of difference (Table 19) between the various segments using the Australian data shows the gender segments to be different to each other in a number of areas, more so than the other variables used. Frequency of wine consumption also has several significant differences, more than wine involvement or age. Whilst these are statistically significant, tests such as these cannot be used in isolation, as although gender differs very highly significant for white house wine, white house wine was reported as a low preference and very low preference by the segments.

Table 19 - T-Test Analysis between Two Segments - Australia

Variety	Gender	Frequent drink Wine	Wine Involvement	Age
1 White house wine	***			
2 White sparkling wine	**			
3 Rose	***	**		*
4 Red house wine	**			
5 Cabernet Sauvignon	***			
6 Shiraz	***			
7 Cabernet/Merlot				
8 Chardonnay			**	
9 Sauvignon Blanc		*		
10 Wine from a well known brand	***	*		
11 Wine from a premium Region		*		

* Significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Limitations and Further Research

This paper has presented results from initial data collected to showcase the ease of making comparisons and segments using Best-Worst data. As such it is not in a position to make recommendations for managers. There is not sufficient data to make generalizations, nor are the two samples directly comparable. T-Tests were not used to test for difference in preference for wine varietal preference between Israel and Australia. There is quite a deal of difference between the two, however the two choice sets used in the research only had 8 out of 11 choice elements the same. Future research will need to develop choice sets that can be used in identical designs across markets. It has shown the importance of conducting further research, with rigorous data collection protocols, and strict replication across markets in order to ‘map’ the segments that emerge with different demands to the market. As in so many industries talk has been focused on ‘myths’, that are unverifiable true or false with regards market segments and the resultant steps to successfully target them. A concerted effort in collecting sufficient quantity of data across a number of markets will enable the data to drive the identification of segments and enable researchers and practitioners to develop strategies to target them based on what we then know empirically about the behaviour and demand of the segments. More data in each market would enable the analysis to be undertaken by multiple segmentation steps; looking at gender, age and income or looking at consumption frequency, income and age to see what segments emerge from the data that are empirically verifiable, are actually capable of being targeted and offer some benefit to the research and managerial communities alike.

The Australian data is more heterogeneous than the Israeli sample; this has future research implications and may have managerial impact once that research has been conducted. It might be that homogeneity is indicative of the degree of development of the market. Data is need from Old World, New World, established, emerging and non-established wine markets in order to see if this holds true. This in turn may have implications for the type of marketing required, whether the message given is focused or broad, brand-based or category-based.

Although the t-tests show statistical differences between the segments examined, they do not show what the segment wants more than the other, or whether it is even a positive ‘best’ score. As such it

is suggested that for researchers and managers, that a sequence be followed of examining rankings, then the groups that emerge with LSD analysis and finally the statistical difference between the segments. They are more likely to be a holistic picture, or map, than a prescriptive direction for target marketing.

Conclusion

This paper has continued on from earlier research using the Best-Worse method regarding wine preferences and sought to present signals that could justify further data collection and replication in other markets in order to push the envelope of what wine marketing knows and understands about different consumer demands and influences with regard their wine choice. To that end, there have not been lengthy discussion of various literature. Previous papers by the researchers and others have discussed the theoretical underpinning of research into consumer attributes for wine choice and possible segmentation variables (see Lockshin and Hall 2003 for a review). This paper has presented results from initial data into key segmentation variables to show how we intend to move this research forward. It has shown a process for looking at the data to show how three steps can be used in a holistic manner in the analysis of choice data. This will be the approach used to gather more data, across markets and begin to map the consumer influence models of the emergent segments.

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