运用概述层次分析法和联合分析对澳门赌场的特点所做的实验研究

Empirical examination of AHP and Conjoint Analysis on casino attributes in Macau

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摘要：

本文粗略比较层次分析法和联合分析的分析结果，证实两者颇为相似。两种方法都在产品或服务的选定属性上产生重要（有效）的成绩。此实证研究是在 282 名大学生中进行。在他们完成调查问卷前，他们都先学会层次分析法和联合分析的使用理论。这项调查是以不记名的方式进行。赌场的主要属性是由部分业内的专家所制定，而那七个被识别的属性是：环境与装饰、提供的游戏种类数目、服务水平、位置和交通、折扣和赠品、免费饮料和小吃，及娱乐节目。此研究的其中一个目的，是为了比较层次及联合分析的相似性及对比其差异性。由于层次和联合分析两者在研究人员之间的日益普及，本实证研究为那些有兴趣使用这其中一种或两种研究工具的人士，提供了有帮助的见解。

Abstract:

A crude examination of the analysis results from AHP and Conjoint Analysis suggests that they are rather similar. They both approaches generate the importance (utility) scores of selected attributes of a product or service. This empirical study was conducted among 282 university students. Before they complete the survey questionnaires, they were all taught about the methodologies of AHP and Conjoint Analysis. The survey was done on an anonymous basis. The main casino attributes were developed among some experts in the industry. The seven casino attributes identified were: Environment and Decoration, Number of Game Types available, Service Standard, Location and Transportation, Rebate and Complimentary, Free Drinks and Snacks, and Entertainment Shows. One of the purposes of this research is to compare the similarities and contrast the differences between AHP and Conjoint

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Analysis. As both AHP and Conjoint Analysis are gaining popularity among researchers, this empirical study helps provide useful insights to those who would be interested in using one or either or both of these research tools.

Key Words:
Analytic Hierarchy Process (AHP); Conjoint Analysis; utility scores; casino attributes; Macau

Understanding customer preferences

It is important for companies operating in a competitive business environment to truly understand the preference of choices accorded by respective customer groups on various product (or service) attributes. An attribute can be defined as characteristics or qualities that describe an object (Babbie, 2001). The relative weightings of importance for each of these attributes provide useful information to explain why different people make different purchase decisions. Saaty (1994), suggests that decision making process comprises of the following steps:

- Structure a problem with a model that shows the key elements and their relationships;
- Elicit judgments reflecting knowledge, feeling, or emotions;
- Quantify those judgments with meaningful numbers;
- Calculate the priorities of the elements of the hierarchy;
- Synthesize these results to ascertain an overall outcome; and
- Analyze sensitivity to changes in judgment.

The ability to detect and understand the sensitivity to changes in judgment made by target customer groups better than competitors can offer enormous advantages. AHP and Conjoint Analysis can produce measure of extent of importance as perceived by the concerned customer groups. These two research tools are discussed.

Analytic Hierarchy Process (AHP)

Analytic Hierarchy Process (AHP), is based on the inherent human ability to make sound judgments about small problems (Hemaida and Kalb, 2001). It adopts a hierarchical approach to organize data for making decisions. The AHP approach involves breaking a problem down and then aggregating the solutions of all sub-problems into a conclusion. It includes and measures all important tangible and intangible, quantitatively measurable, and qualitative factors (Saaty, 1980). Compared to other research approaches (including the Conjoint Analysis)AHP is more simple to understand and easier to implement. It adopts a series of paired comparisons in which the respondents are required to judge about the relative dominance of two items (Clinton, et al., 2002; Yeh, et al., 2001; Murtaza, 2003). In AHP analysis, the eigenvalue decomposition is applied to a matrix of numerical judgments with regard to a set of alternatives, yielding a set of priorities indicating the underlying preferences for the alternatives (Hahn, 2003). Murtaza (2003) suggests that there

should be four essential steps for AHP, viz.:

- Reducing the problem into a hierarchy of interrelated decision elements (factors and alternatives);
- Collecting input data by pair-by-pair comparison of possible decision elements;
- Using the eigenvalue method to estimate the relative weights of decision elements, and
- Aggregating the relative weights to derive a set of ratings for decision making choices.

According to Stewart et al., (2001), utility is a measure of desirability or satisfaction and it provides a uniform scale to compare and/or combine tangible and intangible criteria, whereas a utility function is a device which quantifies the preferences of the decision maker by assigning a numerical index to varying extent of satisfaction of a particular criterion. AHP is used to help solve selection and decision-making problems. It is used to determine the importance weightings of selection criteria (Cheung et al., 2001). Forman and Gass (2001), claim the AHP is a methodology for structuring, measurement, and synthesis. It converts individual preferences into ratio-scale weights that are combined into linear additive weights for the associated alternatives. AHP has three basic functions: (i) structuring complexity into hierarchical homogeneous clusters of factors; (ii) measuring on a ratio scale; and (iii) synthesizing the multitude of factors in a hierarchy. It has been widely applied in many areas, e.g. economics, education, finance, marketing, medicine, organization planning, public policy, resource allocation, sports, strategic formulation, technological choice, training, transport, etc. (Asahi et al., 1995, Cheng and Li, 2003; Koo L. C., 2004).

Conjoint Analysis

Conjoint analysis is a research technique for measuring trade-offs concerning customer preferences and intentions to buy. It can be used to simulate real situations in which consumers may react to changes in current product or to new products (Green et al., 2001). Conjoint analysis is used to determine how people trade off different attributes of a product or service (Jansson, Bointon and Marlow, 2003). Gustafsson et al. (1999) propose the following steps for conducting a conjoint analysis:

1. Identify the research problem and objectives and estimate the amount of available resources;
2. Decide on the sampling approach;
3. Select a survey format;
4. Determine the relevant attributes and the levels of each attribute;
5. Configure attributes and levels into individual concepts;
6. Design the data collection instrument;
7. Conduct the survey;
8. Analyze the data;
9. Validate the results, both internally and externally; and
10. Interpret the results and draw conclusions.

Conjoint analysis has broad practical applications in various fields e.g. wood furniture (Anderson, et al., 2004; credit card (Kara et al., 1994); grocery and candy products,

life insurance, retailing (Toombs and Bailey, 1995); health club service retailers (Amirani and Baker, 1995), eggs (Ness and Gerhardy, 1994); property (Levy, 1995) wine (Gil and Sanchez, 1997); financial service (Arias 1996); training in gaming industry (Koo L. C., 2004); strategic formulation (Luk, 2009); lottery (Koo H. Y., et al., 2009); and beef retailing (Hobbs, 1996). Green et al. (2001) reported that after many decades of development and application, conjoint analysis has survived the test of time. The adoption of Conjoint Analysis is gaining popularity in fields as tourism, entertainment, health maintenance, gambling, and legal disputes.

Conventional research techniques in assessing consumer preference tend to treat each product or service attribute independently and very little information on how consumers are likely to make a favourable or unfavourable buying decision can be revealed through using these traditional techniques. In practice, consumers seldom evaluate each attribute of a product singly and independently when making a purchase decision. Instead they invariably and subconsciously consider the whole range of product attributes in totality. The conjoint based approach can clarify how customers trade off one product attribute against another. Conjoint analysis approach engages the respondents in a more realistic judgement stance than do other research methods. In this respect, Conjoint Analysis can better predict the overall consumer preference through aggregating the utility scores of all individual product attributes (Levy, 1995). It enables not only the assessment of product attributes in a multi-cue setting, but also the quantification of the attribute effect in terms of utility scores. The incorporation of customised set of attributes for different respondents enables the impact of different product attributes to be analysed in the context of cues directly relevant to particular customer segments (Diamantopoulos et al.,1995). Hobbs (1996) observes that Conjoint Analysis has become a popular method for identifying and understanding the combined effects of product attributes on preferences for a product.

Conjoint Analysis requires the respondents to make choices between different products characterised by a unique set of product attributes in a way resembling what they normally do in real life - by trading off features, one against the other. When customers are asked which attributes they would prefer to have, most of them will choose everything on the wish list. Conjoint Analysis can establish the relative values of particular attributes and identifies the trade-offs the customers are likely to make in choosing a product and service and the price (usually an attribute relating to the product or service) that they are willing to pay (Toombs and Bailey, 1995).

Two basic assumptions are needed in Conjoint Analysis (Gil and Sanchez, 1997). Firstly, a product / service can be described as a combination of levels of a set of attributes. Secondly, these attribute levels determines consumers' overall evaluation of the product / service. The relative importance of each attribute is represented as the utility-range (i.e. the difference between the highest and the lowest utility for that attribute divided by the sum of utility ranges of all attributes) (Okechuku, 1993). Conjoint Analysis produces two important results (Levy 1995):

- **Utility of attribute:** *It is a numerical expression of the value consumers place in an attribute level. It represents the relative "worth" of the attribute. Low utility indicates less value; high utility indicates more value.*
- **Importance of attribute:** *It can be calculated by examining the difference between the lowest and highest utilities across the levels of attributes.*

According to Ness and Gerhardy (1993), Conjoint Analysis helps identify consumer segments with similar preferences. Conjoint analysis can thus be used to segment a market based on customer preferences (Koo, Tao, and Yeung, 1999). Arias (1996) suggests that the conjoint-based method of preferential segmentation outperforms other techniques in that it provides a higher level of intra-group homogeneity and inter-group heterogeneity as far as the most preferred product / service design is concerned.

There are two general approaches to data collection for conjoint --- the two-factor-at-a-time trade-off method and the multiple factor full-concept method. The two-factor-at-a-time trade-off method is now rarely used. The full-concept is more realistic as all factors are considered and evaluated at the same time. In the full-concept approach, the respondents are asked to rank or score a set of profiles according to their preference. On each profile, all factors of concern are represented and a different combination of factor levels (i.e. features) appears. The factors are the general attribute categories of the product (e.g. a dress) such as material (cotton, wool, silk,...), colour (red, blue, green, ...), size (large, medium, small), or price ($200, $180; $160,...). The factor levels (i.e. product / service features) are the specific values of the factors such as cotton, red, small, and $180. The possible combination of all factor levels can be too large for respondents to rank or score in a meaningful way. The full-concept approach in SPSS uses fractional factorial designs, which uses a much smaller fraction of all possible alternatives. This reduced size subset (orthogonal array) considers only the main effects and the interactions are assumed to be negligible. The SPSS Conjoint procedure produces utility scores (or part-worths) for each individual respondent and for the entire sample. These utility scores, similar to regression coefficients, can be used to estimate the preference score of each combination of product attributes of a new product profile for that particular respondent or group of respondents. The statistical package also permits the use of simulation profiles to represent actual or prospective products to predict customer preference.

This current research uses Conjoint Analysis to measure utilities of various casino attributes. Knowing which utility cues are more important to a particular customer segment, the concerned casino operator can arrange appropriate trade-offs and determine what attribute combinations can appeal to the targeted customers more effectively and more economically. The casino management can also make predictions about consumers' purchase intentions (or choice decisions) in response to changes to these utility cues. Using these utilities in conjunction with other customer information (e.g. demographics, psychographics) they can more effectively segment the market (Amirani and Baker 1995).

Research Design for AHP and Conjoint Analysis

The first step of the research process is to identify the key casino attributes. These casino attributes were identified through focus group discussion among some veterans in the casino industry in Macau. These attributes should neither be too many nor be too few. After much deliberation, a total of seven casino attributes were revealed.

The seven important casino attributes are:

- **Environment** = Environment and Decoration;
- **GameType** = Number of Game Types available;
- **Service** = Service Standard;
- **Location** = Location and Transportation;
- **Rebate** = Rebate and Complimentary;
- **Drinks** = Free Drinks and Snacks;
- **Show** = Entertainment Shows

A combined survey instrument for AHP and Conjoint Analysis (AHP/CJ) was designed (Appendix 1). This "AHP cum Conjoint Analysis Questionnaire" enables the views from the same respondents collected from both AHP and Conjoint approaches simultaneously. Personal data about gender, age, job type, working experience, and whether the respondents had played in casinos were also collected for further analyses.

The data were collected from university students in Macau. This convenience sample may be a biased sample and thus the survey results have to be interpreted with caution. Before completing the questionnaires, the respondents were all briefed about the AHP and the Conjoint Analysis. The casino attributes were also explained to ensure a more consistent understanding among them. The AHP/CJ questionnaire was anonymous to ensure frank and candid replies. A total of 282 responses were collected from various classes at different universities in Macau (i.e. Macau Millennium College, Macau University of Science and Technology, and Asia International Open University (Macau)). Akaah and Korgaonkar (1988) claim that sample sizes below 100 are typical for Conjoint Analysis. As an exploratory study, the sample size of this study is adequate.

With the AHP approach, a simple matrix can be used to compute the utility scores. The following scoring scheme is adopted. When X is compared to Y, and X is considered to be much more important than Y, a score of 10 is assigned to X. When X is considered to be slightly more important than Y then a score of 5 is assigned to X. When X and Y are perceived to be equally important then a score of 1 is assigned to X. When X is viewed to be slightly less important than Y, a score of 1/5 (or 0.2) is assigned to X. When X is reckoned as much less important than Y, a score of 1/10 (or 0.1) is assigned to X. A particular attribute is compared in turn with all the other attributes accordingly and all the scores are aggregated to reflect the importance of that particular attribute. This approach is repeated with all the attributes. The respective relative utility scores are then calculated for each attribute. These relative utility (or importance) scores for each respondent are unique and add up to 100. These respective importance scores bear a high degree of similarity with those calculated by use of Conjoint Analysis.

As an illustration, the following data represent the perception of the first respondent in the current survey. This matrix approach works pretty simply. However it cannot be efficiently applied to collect the views of many respondents. The last column of Table 1 bears a high degree of similarity with that from the Conjoint Analysis. The use of AHP is much easier and does not require SPSS to compute the utilities. If both AHP and CJ are compatible to each other then this empirical study may be a contribution to research in study of utilities of attributes. In this respect, a similar study was made

with 149 respondents in training attributes (Koo, 2004).

Table 1: Illustrative example of calculation of AHP importance scores for the first Respondent

	A Env	B GT	C Ser	D Loc	E Reb	F Dri	G Show	Subtotal	Relative utility scores	Importance ratings (i.e. Utilities)
A	0	5	0.1	1	0.1	1	1	**8.2**	(8.2*100)/127.7 =	6.4
B	.2	0	0.1	1	0.1	1	1	**3.4**	(3.4*100)/127.7 =	2.7
C	10	10	0	0.1	0.2	0.1	0.1	**20.5**	(20.5*100)/127.7 =	16.1
D	1	1	10	0	5	0.2	1	**18.2**	(18.2*100)/127.7 =	14.3
E	10	10	5	0.2	0	10	10	**45.2**	(45.2*100)/127.7 =	35.4
F	1	1	10	5	0.1	0	1	**18.1**	(18.1*100)/127.7 =	14.2
G	1	1	10	1	0.1	1	0	**14.1**	(14.1*100)/127.7 =	11.0
Total:								127.7		**100**

Instead of using the AHP matrix approach, a questionnaire can be designed and the relative importance scores can be easily computed. For n attributes, there will be n(n – 1)/2 possible pairs of comparisons. In this case there are 7(7 – 1)/2 or 21 pairs of comparisons. Accordingly, a 21-item questionnaire would suffice to replace the use of matrix. For this particular respondent, the importance (utility) scores of these seven casino attributes are listed in the last column of the Table 1 above. These AHP utility scores can be compared to those that would be computed from Conjoint Analysis utility scores (see Table 2)

Table 2: Comparison of importance scores computed by Conjoint Analysis and AHP

Casino Attributes	Conjoint Analysis importance for the first respondent	AHP importance for the first respondent	**Conjoint Analysis importance for the 282 respondents**	**AHP importance for the 282 respondents**
Environment	4.785	6.4	**10.315**	**13.0**
GameType	2.597	2.7	**7.848**	**11.8**
Service	40.465	16.1	**29.026**	**21.4**
Location	8.407	14.3	**10.903**	**14.4**
Rebate	28.845	35.4	**15.054**	**17.8**
Drinks	9.979	14.2	**13.576**	**12.8**
Show	4.921	11.0	**13.278**	**8.9**

There are altogether (3 x 3 x 5 x 3 x 4x 4 x 4) or 8640 possible combinations of casino profiles that can be rated by the respondents. To address this impossible task of asking respondents to rate 8640 possible combinations, the SPSS deploys the use of orthogonal design and produces a parsimonious array of 32 profiles. In order to ascertain the predictive power of the model three holdout cases (i. e. combination profiles 2, 28, and35) were added randomly in the Conjoint scoring list. Holdout cases are those combination generated by SPSS and they are not used to compute the utilities. With the output of SPSS utility values, these holdout cases are used

subsequently to check how precise the utility values can predict the scores input by the respondents. It is natural that holdout cases are not as predictive as those 32 combinations which are also used in the computation of utility scores.

Prima facie evidence from the above Table 2 suggests that the AHP and Conjoint importance scores do not match too well for the first respondent P1. However, on a collective basis for the 282 respondents, the importance scores between the AHP and Conjoint Analysis are more similar. The phenomenon of regression to mean is evident here. The difference among the importance scores of these seven casino attributes is less drastic in the collective basis (CJ Importance: minimum 7.8, maximum 29.0 versus AHP Importance: minimum 8.9, maximum 21.4). This can be contrasted with the first respondent's scores (CJ Importance: minimum 2.6, maximum 40.5 versus AHP Importance: minimum 2.7, maximum 35.4).

Table 3 depicts the results of a bivariate correlation analysis among the importance scores computed from AHP and Conjoint Analysis respectively. The results suggest that the importance scores computed from AHP are significantly and positively correlated with those calculated from Conjoint Analysis. This suggests that both AHP and Conjoint Analysis generate importance scores that have positive correlation relationship. Further examination by means of paired samples t-test, is conducted to detect the similarity of results generated by these two approaches.

Table 3: Correlation analysis of importance scores between AHP and Conjoint Analysis

		u1 AHP: Environment & Decoration Utility	u2 AHP: No of Game Types Utility	u3 AHP: Service Standard Utility	u4 AHP: Location & Transportation Utility	u5 AHP: Rebate & Complimentary Utility	u6 AHP: Free Drinks & Snacks Utility	u7 AHP: Entertainment Shows Utility
CJ_U1 CJ: Environment & Decoration Utility	Pearson Correlation	**.130***	-.066	.022	-.046	-.075	.014	.051
	Sig. (2-tailed)	.030	.267	.711	.440	.211	.809	.389
	N	282	282	282	282	282	282	282
CJ_U2 CJ: No of Game Types Utility	Pearson Correlation	.033	**.304****	-.081	.103	-.146*	-.109	-.079
	Sig. (2-tailed)	.581	.000	.173	.083	.014	.067	.185
	N	282	282	282	282	282	282	282
CJ_U3 CJ: Service Standard Utility	Pearson Correlation	-.082	-.072	**.383****	-.038	-.055	-.090	-.119*
	Sig. (2-tailed)	.171	.228	.000	.520	.358	.133	.046
	N	282	282	282	282	282	282	282
CJ_U4 CJ: Location & Transportation Utility	Pearson Correlation	.040	.180**	-.133*	**.235****	-.078	-.132*	-.098
	Sig. (2-tailed)	.501	.002	.026	.000	.189	.026	.101
	N	282	282	282	282	282	282	282
CJ_U5 CJ: Rebate & Complimentary Utility	Pearson Correlation	-.215**	-.026	-.228**	-.017	**.412****	.028	-.033
	Sig. (2-tailed)	.000	.669	.000	.778	.000	.645	.584
	N	282	282	282	282	282	282	282
CJ_U6 CJ: Free Drinks & Snacks Utility	Pearson Correlation	.074	-.146*	-.121*	-.093	-.028	**.286****	.090
	Sig. (2-tailed)	.214	.014	.042	.119	.644	.000	.131
	N	282	282	282	282	282	282	282
CJ_U7 CJ: Entertainment Show Utility	Pearson Correlation	.175**	.032	-.081	-.034	-.196**	-.034	**.240****
	Sig. (2-tailed)	.003	.589	.173	.565	.001	.572	.000
	N	282	282	282	282	282	282	282

Table 4: Paired samples t-test on importance scores

Paired Samples Test for importance scores calculated from AHP and Conjoint Analysis

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	u1 AHP: Environment & Decoration Utility - CJ_U1 CJ: Environment & Decoration Utility	2.65413	9.01794	.53701	1.59706	3.71121	4.942	281	.000
Pair 2	u2 AHP: No of Game Types Utility - CJ_U2 CJ: No of Game Types Utility	3.91964	7.98657	.47559	2.98346	4.85581	8.242	281	.000
Pair 3	u3 AHP: Service Standard Utility - CJ_U3 CJ: Service Standard Utility	-7.66271	11.50587	.68516	-9.01142	-6.31400	-11.184	281	.000
Pair 4	u4 AHP: Location & Transportation Utility - CJ_U4 CJ: Location & Transportation Utility	3.50410	8.69760	.51793	2.48458	4.52363	6.766	281	.000
Pair 5	u5 AHP: Rebate & Complimentary Utility - CJ_U5 CJ: Rebate & Complimentary Utility	2.77749	10.17360	.60583	1.58495	3.97003	4.585	281	.000
Pair 6	u6 AHP: Free Drinks & Snacks Utility - CJ_U6 CJ: Free Drinks & Snacks Utility	-.79004	8.87293	.52838	-1.83011	.25004	-1.495	281	.136
Pair 7	u7 AHP: Entertainment Shows Utility - CJ_U7 CJ: Entertainment Show Utility	-4.40262	8.14898	.48526	-5.35783	-3.44740	-9.073	281	.000

Despite the superficial similarity between AHP and Conjoint Analysis, six out of seven attributes are significantly different. This can be explained by the fact that for AHP approach, the relative importance of two attributes is compared pair by pair and not conjointly. As Conjoint Analysis yields other useful information that the AHP cannot produce. In Conjoint Analysis, the utility values for each factor level are generated. This information is useful for the casino operator to perform a trade-off analysis by varying the factor levels for different customer segments. This helps the decision maker to scientifically determine the best product attribute mix and perform the cost benefit analyses for various improvement scenarios. Additionally, the use of holdout cases help establish the strength of prediction of the conjoint utility scores. The Pearson correlation coefficients for the predicted values of the three hold out cases (cases 2, 28, and 35) with the original values assigned by the respondents are 0.53 (2-tailed significance p=0.000), 0.54 (2-tailed significance p=0.000), and 0.80 (2-tailed significance p =0.022) respectively.

Table 5: Pearson Correlation Coefficients of original scores and predicted scores

Casino No.	Corr. Coeff.	Casino No.	Corr. Coeff.	*Casino No.*	Corr. Coeff.	Casino No.	Corr. Coeff.	Casino No.	Corr. Coeff.
1	0.896	8	0.906	*15*	0.943	22	0.903	29	0.933
2*	0.531	9	0.913	*16*	0.899	23	0.956	30	0.827
3	0.868	10	0.923	*17*	0.950	24	0.922	31	0.947
4	0.880	11	0.909	*18*	0.911	25	0.887	32	0.953
5	0.889	12	0.959	*19*	0.920	26	0.929	33	0.951
6	0.920	13	0.963	*20*	0.939	27	0.841	34	0.962
7	0.829	14	0.971	*21*	0.919	28*	0.539	35*	0.800

* Denoting holdout cases

Figure 1: Scatter plot of case 13 with Pearson Correlation Coefficient = 0.963

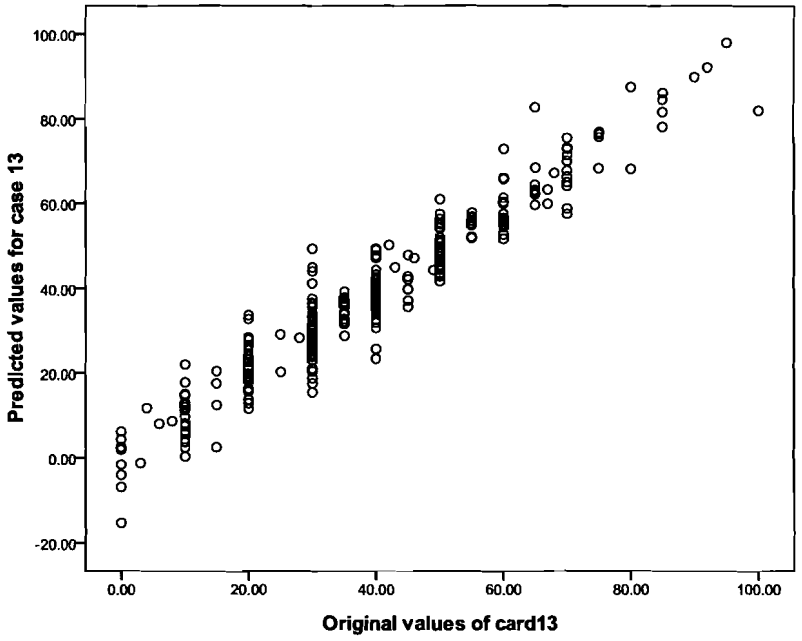
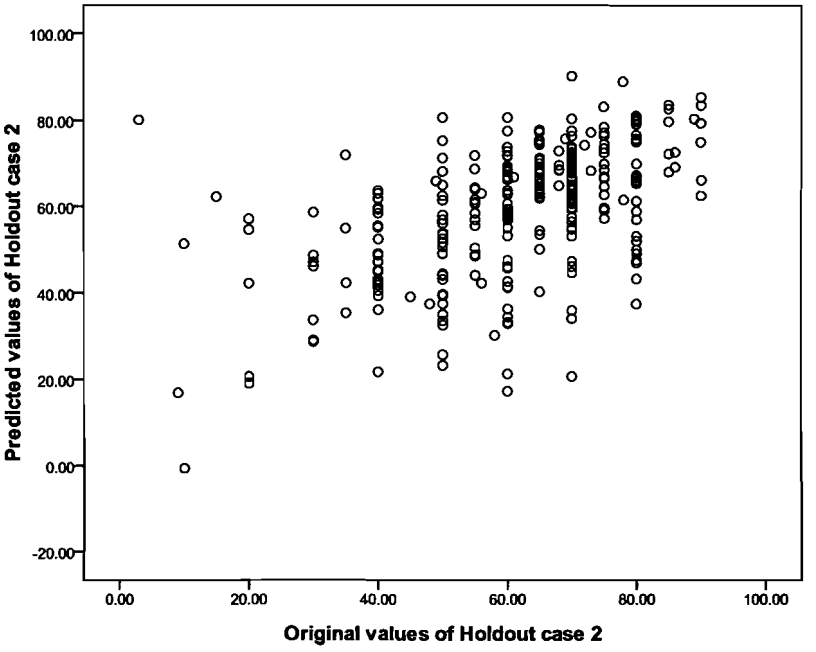


Figure 1 depicts graphically the relationship between the original and predicted values of the 282 respondents. This particular casino attribute combination results in the highest correlation coefficient (0.963).

Figure 2: Scatter plot of case 2 with Pearson Correlation Coefficient = 0.531



Although the correlation of the original and predicted values of holdout case 2 is much weaker, it is still highly significant (with 2 tailed significance level < 0.0005). This suggests that Conjoint Analysis is useful in predicting customer preference through using the various utilities of various casino attribute levels.

Application of the utility scores from Conjoint Analysis

Beyond doubt, Conjoint Analysis is far more useful than AHP. Conjoint resembles the real situation much better. In the following analyses, emphasis will be put on Conjoint Analysis. Appendix 2 outlines the overall utilities and importance scores of all 282 respondents. Collectively, the preference score (ranging from 0 to 100) for the "worst" possible casino is:

Preference scores of least preferred casino (which environment and decoration is 'basic'; with 'few' game types; providing 'very poor' service standard; with 'inconvenient' location; offering 'no' rebate; providing 'few' drinks and snacks; and having 'poor' entertainment shows).

= 53.9 - 3.4 - 2.0 - 10.4 - 3.0 - 2.8 – 3.0 - 3.4

= 25.9

Similarly, the preference scores of most preferred casino (which environment and decoration is 'luxurious'; with 'plenty' of game types; providing 'excellent' service standard; with 'convenient' location; offering 'high' rebate; providing 'plenty' of drinks and snacks; and having 'excellent' entertainment shows).

= 53.9 + 2.8 + 1.3 + 9.2 + 2.9 + 4.5 + 4.6 + 3.9

= 83.1

The demographic details of the 282 respondents are as follows:

- Gender: 130 Male (46.4%), 150 Female (53.6%%);
- Age: 42 under 21 years (14.9), 209 21-30 years (74.4%), 25 31-40 years (8.9%), 5 over 40 years (1.8%);

- Job type: 72 Full time students/ unemployed (25.7%), 129 working in Casinos (46.1%), 36 in other service companies (12.9%), 12 with the Government (4.3%), 5 Professional/ self employed (1.8%), 20 Others (7.1%)
- Working experience: 56 under one year (20.2%), 198 with 1-10 years (70.2%), 20 with 10-20 years (7.2%), 3 with over 20 years (1.1%)
- Whether played in casinos in the past three years: 201 yes (72.0%) 78 No (28.0%)

On the whole the respondents are relatively young in age and represent the demographic pattern of adult university students studying on part-time basis. The following tables (Tables 6 -10) outline the demographic details of the 282 respondents. Further inferential analyses will be conducted to detect if any of these demographic variables is discerning on the importance scores of the seven casino attributes.

Table 6: Distribution of gender of 282 respondents

v1 Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Male	130	46.1	46.4	46.4
	2.00 Female	150	53.2	53.6	100.0
	Total	280	99.3	100.0	
Missing	System	2	.7		
Total		282	100.0		

Table 7: Independent T-test of Location by Gender

Significant at 0.039 level

	v1 Gender	N	Mean	Std. Deviation	Std. Error Mean
CJ_U4 CJ: Location & Transportation Utility	1.00 Male	130	11.6724	5.79510	.50826
	2.00 Female	150	10.2999	5.27544	.43074

The male respondents have higher importance for location and transportation of casino than the female respondents.

Table 8: Distribution of age of 282 respondents

v2 Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 21years and below	42	14.9	14.9	14.9
	2.00 21-30 years	209	74.1	74.4	89.3
	3.00 31-40 years	25	8.9	8.9	98.2
	4.00 41-50 years	4	1.4	1.4	99.6
	5.00 Over 50 years	1	.4	.4	100.0
	Total	281	99.6	100.0	
Missing	System	1	.4		
Total		282	100.0		

In order to facilitate the oneway ANOVA, the one respondent at age over 50years is recoded to become a member in group 4 (i.e. group 4 represent respondents with age

over 40 years). The test of homogeneity of variance is performed and the significance level is larger than 0.05. The demographic variable can only discern "Rebate" and no significant difference is detected for the other six casino attributes. This group of respondent with age over 40 have significantly higher importance attached for "Rebate and Complimentary.

Table 9: Oneway ANOVA of Rebate by Age

Multiple Comparisons

CJ_U5 CJ: Rebate & Complimentary Utility
Bonferroni

(I) v2R	(J) v2R	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-1.80007	1.41208	1.000	-5.5524	1.9523
	3.00	-3.49981	2.10942	.589	-9.1053	2.1056
	4.00	-15.77524*	3.95056	.001	-26.2732	-5.2772
2.00	1.00	1.80007	1.41208	1.000	-1.9523	5.5524
	3.00	-1.69974	1.76720	1.000	-6.3958	2.9963
	4.00	-13.97517*	3.77893	.002	-24.0171	-3.9333
3.00	1.00	3.49981	2.10942	.589	-2.1056	9.1053
	2.00	1.69974	1.76720	1.000	-2.9963	6.3958
	4.00	-12.27543*	4.09096	.018	-23.1465	-1.4043
4.00	1.00	15.77524*	3.95056	.001	5.2772	26.2732
	2.00	13.97517*	3.77893	.002	3.9333	24.0171
	3.00	12.27543*	4.09096	.018	1.4043	23.1465

*. The mean difference is significant at the 0.05 level.

Table 10: Distribution of job type of 282 respondents

v3 Job type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Full time student/unemployed	72	25.5	25.7	25.7
	2.00 Casino	129	45.7	46.1	71.8
	3.00 Other service companies	36	12.8	12.9	84.6
	4.00 Government	12	4.3	4.3	88.9
	5.00 Professional/self-employed	5	1.8	1.8	90.7
	6.00 Manufacturing	6	2.1	2.1	92.9
	7.00 Others	20	7.1	7.1	100.0
	Total	280	99.3	100.0	
Missing	System	2	.7		
Total		282	100.0		

Out of the seven casino attributes, Location and Rebate do not pass the test of homogeneity of variances. They were separately compared with independent samples t-test. Those working in Casino have a higher importance on Rebate than the Full time students. The other five casino attributes (i.e. Environment, Game types, Service, Drinks, and Shows) were tested with oneway ANOVA. Those working in Government have a higher importance on "Drinks and Snacks" than those

working in Casinos and with Others job type.

Table 11: Distribution of working experience of 282 respondents

v4 Working experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Under 1 year	56	19.9	20.2	20.2
	2.00 1-10 years	198	70.2	71.5	91.7
	3.00 10-20 years	20	7.1	7.2	98.9
	4.00 Over 20 years	3	1.1	1.1	100.0
	Total	277	98.2	100.0	
Missing	System	5	1.8		
Total		282	100.0		

Table12: Distribution of working experience of 282 respondents

Multiple Comparisons

CJ U5 CJ: Rebate & Complimentary Utility
Bonferroni

(I) v4 Working experience	(J) v4 Working experience	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00 Under 1 year	2.00 1-10 years	-2.60985	1.27261	.247	-5.9920	.7723
	3.00 10-20 years	-1.52086	2.19029	1.000	-7.3418	4.3001
	4.00 Over 20 years	-18.75127*	4.98283	.001	-31.9938	-5.5088
2.00 1-10 years	1.00 Under 1 year	2.60985	1.27261	.247	-.7723	5.9920
	3.00 10-20 years	1.08899	1.97281	1.000	-4.1540	6.3320
	4.00 Over 20 years	-16.14142*	4.89113	.007	-29.1402	-3.1426
3.00 10-20 years	1.00 Under 1 year	1.52086	2.19029	1.000	-4.3001	7.3418
	2.00 1-10 years	-1.08899	1.97281	1.000	-6.3320	4.1540
	4.00 Over 20 years	-17.23042*	5.20587	.006	-31.0656	-3.3952
4.00 Over 20 years	1.00 Under 1 year	18.75127*	4.98283	.001	5.5088	31.9938
	2.00 1-10 years	16.14142*	4.89113	.007	3.1426	29.1402
	3.00 10-20 years	17.23042*	5.20587	.006	3.3952	31.0656

*. The mean difference is significant at the 0.05 level.

All seven casino attributes pass the test of homogeneity of variances. However Years of working experience is discerning only on Rebate. From Table 12 above it is clear that those with over 20 years of working experience have higher importance for Rebate than those respondents who are younger.

Table 13: Distribution of having played in casino of 282 respondents

v5 have played in Casino in last 3 years?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes	201	71.3	72.0	72.0
	2.00 No	78	27.7	28.0	100.0
	Total	279	98.9	100.0	
Missing	System	3	1.1		
Total		282	100.0		

Table 7: Independent T-test of Location by Gender

Group Statistics

	v5 have played in Casino in last 3 years?	N	Mean	Std. Deviation	Std. Error Mean
CJ_U5 CJ: Rebate & Complimentary Utility	1.00 Yes	201	13.9515	8.00362	.56453
	2.00 No	78	17.7304	9.43480	1.06828

It is interesting to note that those who have played in casinos in Macau have significantly lower importance attached to Rebate than those who have not played in the casinos in the last three years.

Conclusion

Despite the superficial similarity between the importance scores computed from AHP and from conjoint analysis, this empirical study suggests that Conjoint Analysis is obviously better. The comparison in AHP is on pair-by-pair comparison basis and the casino attributes are considered singly and independently. In the case of conjoint analysis, the preference decision is by weighting the utilities of all product attributes concurrently. Conjoint Analysis approach can resemble the reality. The Conjoint Analysis provides opportunity to conduct trade-off evaluation and can help marketers to better predict the likely responses of the targeted customers. Different attributes can be substituted to determine the overall utility value of a specific combination of various attributes.

Conjoint analysis can generate more useful information than the AHP. However the use of conjoint analysis is far more complicated and it requires the help of statistical packages. Although both AHP and conjoint are powerful research tools, they have to be used with caution. If some important product attributes are omitted in the first place then no matter how well and accurate subsequent analyses are, the results can still be misleading.

The important casino attributes as revealed by this empirical study, using conjoint analysis, in descending order of importance are as follow (with details of all factor levels in Table 2):-

- ✧ Service Standard (mean importance score of 29.02)
- ✧ Rebate (mean importance score of 15.05)
- ✧ Free Drinks and Snacks (mean importance score of 13.58)
- ✧ Entertainment Shows (mean importance score of 13.28)
- ✧ Location and Transportation (mean importance score of 10.90)
- ✧ Environment and Decoration (mean importance score of 10.32)
- ✧ Number of Game Types available (mean importance score of 7.85)

Appendix 1: AHP cum Conjoint Analysis Questionnaire

Please rate the importance of the following seven casino attributes from the perspective of a customer through comparing pair by pair. Please circle the appropriate score on the right. The 7 attributes are: ● **Environment** = Environment and Decoration; ● **GameType** = Number of Game Types available; ● **Service** = Service Standard; ● **Location** = Location and Transportation; ● **Rebate** = Rebate and Complimentary; ● **Drinks** = Free Drinks and Snacks; ● **Show** = Entertainment Shows			Much more important	Slightly more important	Equally important	Slightly more unimportant
1	Comparing	"Environment" and "GameType" I consider "Environment" to be:	1	2	3	4
2	Comparing	"Environment" and "Service" I consider "Environment" to be:	1	2	3	4
3	Comparing	"Environment" and "Location" I consider "Environment" to be:	1	2	3	4
4	Comparing	"Environment" and "Rebate" I consider "Environment" to be:	1	2	3	4
5	Comparing	"Environment" and "Drinks" I consider "Environment" to be:	1	2	3	4
6	Comparing	"Environment" and "Show" I consider "Environment" to be:	1	2	3	4
7	Comparing	"GameType" and "Service" I consider "GameType" to be:	1	2	3	4
8	Comparing	"GameType" and "Location" I consider "GameType" to be:	1	2	3	4
9	Comparing	"GameType" and "Rebate" I consider "GameType" to be:	1	2	3	4
10	Comparing	"GameType" and "Drinks" I consider "GameType" to be:	1	2	3	4
11	Comparing	"GameType" and "Show" I consider "GameType" to be:	1	2	3	4
12	Comparing	"Service" and "Location" I consider "Service" to be:	1	2	3	4
13	Comparing	"Service" and "Rebate" I consider "Service" to be:	1	2	3	4
14	Comparing	"Service" and "Drinks" I consider "Service" to be:	1	2	3	4
15	Comparing	"Service" and "Show" I consider "Service" to be:	1	2	3	4
16	Comparing	"Location" and "Rebate" I consider "Location" to be:	1	2	3	4
17	Comparing	"Location" and "Drinks" I consider "Location" to be:	1	2	3	4
18	Comparing	"Location" and "Show" I consider "Location" to be:	1	2	3	4
19	Comparing	"Rebate" and "Drinks" I consider "Rebate" to be:	1	2	3	4
20	Comparing	"Rebate" and "Show" I consider "Rebate" to be:	1	2	3	4
21	Comparing	"Drinks" and "Show" I consider "Drinks" to be:	1	2	3	4

Your personal information:

Gender: Male [ ]; Female [ ]

Age: Under 21 years [ ]; 21-30 years [ ]; 31-40 years [ ]; 41-50 years[ ]; Over 50 years[ ]

Job Type: Full time student/ unemployed[ ]; Casino[ ]; Other service companies[ ]; Government[ ]; Professional/ self-employed[ ]; Manufacturing[ ]; Others[ ]

Working Experience: 0-1 years [ ]; 1-10years [ ]; 10-20years [ ]; Over 20years [ ]

Have played in casino in last 3 years?: Yes [ ]; No [ ]

Please score the following 35 casinos from 0 to 100, with lower scores representing

less preferred casinos and higher scores for more preferred casino. The "best" casino will have 100 and the worst will have 0.

Casino	Score	Environ-ment	Game-Type	Service	Location	Rebate	Drinks	Show
1		Basic	Plenty	Average	Convenient	Average	Few	Average
2[a]		Comfortable	Plenty	Average	Convenient	Low	Few	Excellent
3		Luxurious	Average	Excellent	Convenient	Average	Plenty	Poor
4		Luxurious	Plenty	Excellent	Convenient	None	None	None
5		Comfortable	Average	Average	Convenient	High	Few	None
6		Basic	Plenty	Excellent	Inconvenient	High	Average	None
7		Luxurious	Plenty	Good	Average	Low	Average	Excellent
8		Luxurious	Few	Excellent	Convenient	Low	None	Average
9		Basic	Few	Average	Convenient	None	Average	Excellent
10		Basic	Average	Good	Convenient	None	Plenty	Average
11		Comfortable	Average	Excellent	Average	Average	Average	Average
12		Comfortable	Plenty	Poor	Inconvenient	None	None	Average
13		Luxurious	Average	VeryPoor	Inconvenient	None	Average	Poor
14		Luxurious	Few	VeryPoor	Average	High	Few	Average
15		Basic	Few	Excellent	Inconvenient	Low	Few	Poor
16		Luxurious	Plenty	Good	Convenient	None	Few	Poor
17		Comfortable	Plenty	VeryPoor	Convenient	Low	Plenty	None
18		Comfortable	Plenty	Excellent	Average	None	Few	Excellent
19		Comfortable	Plenty	Average	Convenient	Low	Average	Poor
20		Luxurious	Few	Average	Average	None	Plenty	None
21		Luxurious	Plenty	Average	Average	Average	None	Poor
22		Luxurious	Plenty	Good	Inconvenient	Average	Few	None
23		Basic	Plenty	VeryPoor	Convenient	Average	None	Excellent
24		Luxurious	Average	Average	Inconvenient	High	None	Excellent
25		Luxurious	Plenty	Average	Inconvenient	Low	Plenty	Average
26		Comfortable	Few	Good	Inconvenient	Average	Plenty	Excellent
27		Luxurious	Plenty	Excellent	Convenient	High	Plenty	Excellent
28[a]		Luxurious	Average	VeryPoor	Convenient	Low	Few	Average
29		Comfortable	Few	Good	Convenient	High	None	Poor
30		Luxurious	Plenty	Good	Convenient	High	Average	Average
31		Basic	Average	Good	Average	Low	None	None
32		Luxurious	Few	Poor	Convenient	Average	Average	None
33		Luxurious	Average	Poor	Convenient	Low	Few	Excellent
34		Basic	Plenty	Poor	Average	High	Plenty	Poor
35[a]		Luxurious	Average	Poor	Average	High	None	None

Appendix 2: Conjoint summary of all 282 respondents

Utilities of 282 respondents

		Utility Estimate	Std. Error
Environment	Luxurious	2.835	0.59
	Comfortable	.530	0.69
	Basic	-3.365	0.69
GameType	Plenty	1.344	0.59
	Average	.635	0.69
	Few	-1.978	0.69
Service	Excellent	9.247	0.83
	Good	6.405	0.83
	Average	2.050	0.83
	Poor	-7.261	1.07
	VeryPoor	-10.441	1.07
Location	Convenient	2.897	0.59
	Average	.097	0.69
	Inconvenient	-2.994	0.69
Rebate	High	4.511	0.76
	Average	.406	0.76
	Low	-2.154	0.76
	None	-2.763	0.76
Drinks	Plenty	4.580	0.76
	Average	.766	0.76
	Few	-2.950	0.76
	None	-2.396	0.76
Show	Excellent	3.886	0.76
	Average	.942	0.76
	Poor	-3.392	0.76
	None	-1.436	0.76
(Constant)		53.898	0.53

References:

http://www.chartwellsystems.com/sscalc.htm#terminology

Akaah I., and P. K. Korgaonkar (1988) **"A conjoint investigation of the relative importance of risk relievers in direct marketing"** *Journal of Advertising Research,* August - September

Amirani S., and J. Baker (1995) **"Quality cues and retail target market strategy: a conjoint-based application"** *International Journal of Retail & Distribution Management* Vol 23 No. 5 pp. 22-31

Anderson, R. C., and Hansen, E. N. (2004) **"The impact of environmental certification on preferences for wood furniture: A conjoint analysis approach"** *Forest Products Journal* Vol. 54, No. 3, pp. 42-50

Arias J. T. G. (1996) **"Conjoint-based preferential segmentation in the design of a new financial service"** *International Journal of Bank Marketing* 14/3 pp30-32

Asahi, T., D. Ture, and B. Shneiderman (1995) **"Using Treemaps to Visualize the Analytic Hierarchy Process"** *Information Systems Research* 6:4 pp. 357-375

Babbie, Earl (2001) ***The Practice of Social Research*** 9th ed., Wadsworth, a division of Thomson Learning Inc.

Cheng, E. W. L., and H. Li, (2003) **Utility of consistency measure in the analytic hierchy process"** *Construction Innovation,* 3: pp. 231-247

Cheung, S.O., T.I. Lam, M.Y. Leung, and Y.W. Wan (2001) **"An analytical hierarchy process based procurement selection method"** *Construction Management and Economics,* 19, pp. 427-437

Clinton, B. D., S.A. Webber, and J. M. Hassell (2002) **"Implementing the Balanced Scorecard Using the Analytic Hierarchy Process"** *Management Accounting Quarterly,* Spring, Vol. 3, No. 3 pp. 1-11

Diamantopoulos A., B. B. Schlegelmilch, and J.P. Du Preez (1995) **"Lessons for pan-European marketing? The role of consumer preferences in fine-tuning the product-market fit"** *International Marketing Review* Vol.12 No. 2 pp 38-52

Forman, E. H. and S. I. Gass (2001) **"The Analytic Hierarchy Process – an exposition"** *Operations Research* Vol 49, No. 4, July-August, pp. 469-486

Gil J. M. and M. Sanchez (1997) **"Consumer preferences for wine attributes: a conjoint approach"** *British Food Journal* 99/1 pp 3-11

Green, P. E., A. M. Krieger and Y. Wind (2001) **"Thirty Years of Conjoint Analysis: Reflections and Prospects"** *Interfaces* 31:3 Part 2 of 2, May-June

pp. S56-S57

Gu, Liang Zhi (2004) "

Gustafsson, A., F. Ekdahl, and B. Bergman (1999) **"Conjoint analysis: a useful tool in the design process"** *Total Quality Management*, Vol., 10, No. 3, pp. 327-343

Hahn, E. D. (2003) **"Decision Making with Uncertain Judgments: A Stochastic Formulation of the Analytic Hierarchy Process"** *Decision Sciences*, Vol. 34 No. 3, Summer, pp. 443-466

Hemaida, R. S. and Kalb, E. (2001) **"Using the Analytic Hierarchy Process for the Selection of First-Year Family Practice Residents"** *Hospital Topics: Research and Perspectives on Healthcare* Vol. 79 No. 1 Winter, pp. 11-15

Hobbs J. E. (1996) **"A transaction cost analysis of quality, traceability and animal welfare issues in UK beef retailing"** *British Food Journal* 98/6 pp. 16-26

Jansson, C., Bointon, B., and Marlow, N. (2003) **"An exploratory conjoint analysis of consumers' aesthetic responses of Point-of-Purchase materials"** *International Review of Retail, Distribution and Consumer Research* 13:1 January, pp. 59-76

Kara A., E. Kaynak, and O. Kucukemiroglu (1994) **"Credit Card Development Strategies for the Youth Market: The Use of Conjoint Analysis"** *International Journal of Bank Marketing* Vol. 12 No. 6 pp. 30-36

Koo, H.Y., Koo, L. C., Pang H. D. (2009) "**The Consideration of players in buying the physical lottery tickets**" Conference Proceedings of An International Conference on Gaming Industry and Public Welfare, Macau, 1-3 Dec. pp. 251-269
顾向恩、顾良智、彭道海（2009）"彩民购买体育彩票的考虑因素研究"《2009 博彩产业与公益事业国际学术研讨会论文集》十二月一至三日、澳门、251-269 页

Koo, L. C. (1999) **"Conjoint Analysis"** in *The Industrial Engineering Applications and Practice: Users' Encyclopaedia International Journal of Industrial Engineering* ISBN 0-965499-0-X

Koo, L. C. (2004) " **Empirical Comparison of AHP and Conjoint Analysis on Training in the Gaming Industry in Macau SAR**" Conference Proceedings of An International Conference on Gaming Industry and Public Welfare, Beijing and Macau, 6-10 Dec., pp. 480-508 顾良智（2004）"以分析阶层程序与联合分析替澳门特别行政区博彩业培训属性的经验比较"《2004 博彩产业与公益事业国际学术研讨会论文集》十二月六至十日、北京与澳门、 480-508 页

Koo, L. C., Tao, Fredrick K. C., and Yeung, John, H. C. (1999) **"Preferential segmentation of restaurant attributes through conjoint analysis"** *International Journal of Contemporary Hospitality Management* 11/5 pp. 242-250

Levy D. S. (1995) **"Modern marketing research techniques and the property professional"** *Property Management* Vol. 13 No. pp. 33-40

Luk, Tei Lewis (2009) "**An empirical study on the application of Innovative Strategic Formulation Models in ABC Limited**" An unpublished DBA thesis of Asia International Open University (Macau)

Murtaza, M. B. (2003) **"Fuzzy-AHP Application to Country Risk Assessment"** *American Business Review*, June, pp. 109-116

Ness M. R. and H. Gerhardy (1994) **"Consumer Preferences for Quality and Freshness Attributes of Eggs"** *British Food Journal* Vol. 96 No. 3 pp. 26-34

Norusis M.J. (1993) ***SPSS for Windows Base System User's Guide Release 6.0*** SPSS Inc., Chicago

Okechuku C. (1993) **"The Importance of Product Country of Origin: A Conjoint Analysis of the United States, Canada, Germany and the Netherlands"** *European Journal of Marketing* Vol. 28 No. 4 pp. 5-19

Saaty,T. L. (1980) ***The analytic hierarchy process*** New York, McGraw-Hill

Saaty, T. L. (1994) **"How to Make a Decision: The Analytic Hierarchy Process"** *Interfaces* 24: 6 Nov. – Dec. pp.19-43

SPSS (1994) ***SPSS Categories 6.1*** SPSS Inc Chicago, 209 pages

Stewart, R. A., and M. Sherif (2001) **"Utilizing the balanced scorecard for IT/IS performance evaluation in construction"** *Construction Innovation,* 1: pp. 147-163

Toombs K., and G. Bailey (1995) **"How to redesign your organization to match customer needs"** *Managing Service Quality* Vol. 5 No. 3 pp 52-56

Yeh, Jong-Mau, Borwen Kreng and Chinho Lin (2001) **"A consensus approach for synthesizing the elements of comparison matrix in the Analystic Hierarchy Process"** *International Journal of Systems Science* Vol. 32, No. 11, pp. 1353-1363

References

Bassie, L. and McMurrer, D. (2007), "Maximizing your return on people," *Harvard Business Review*, 85(March), 115-123.

Berry, L.L. and Parasuraman, A. (1991). *Marketing services: Competing through quality*. New York: The Free Press.

Berry, L.L. and Parasuraman, A. (1992), "Service marketing starts from within," Marketing Management, 1(1), 25.

Berry, L.L., Hensel, J.S. and Burke, M.C. (1976), "Improving retail capability for effective consumerism response," *Journal of Retailing*, 52(3), 3-14.

Grönroos, C. (1990). *Service management and marketing: Managing the moment of truth in service competition*. Oxford: Maxwell Macmillan.

Gu, Z. and Siu, R.C.S. (2009), "Drivers of job satisfaction as related to work performance in Macao casino hotels," *International Journal of Contemporary Hospitality Management*, 21(5), 561-578.

Harel, G.H. and Tzafrir S.S. (1999), "The effect of human resource management practices on the perceptions of organizational and market performance of the firm," *Human Resource Management*, 38(3), 185-199.

Heskett, J.L., Jones, T.O., Loveman, G.W., Sasser, W.E., and Schlesinger, L. E. (1994), "Putting the service profit-chain to work," *Harvard Business Review*, March-April, 164-174.

Joseph, B.W. (1996), "Internal marketing builds service quality," *Journal of Health Care Marketing*, 16(1), 54–64.

Kale, S.H. (2007), "Internal marketing: An antidote for Macau's labor shortage," *UNLV Gaming Research & Review Journal*, 11(1), 1-11.

Kasper, H., Van Helsdingen, P. and De Vries, W. Jr (1999). *Services marketing management: An international perspective*. New York: John Wiley.

Rafiq, M and Ahmed, P.K. (1993), "The scope of internal marketing: Defining the boundary between marketing and human resource management," *Journal of Marketing Management*, 9(3), 219-232.

Ruiz, G. (2006), "Mixing up its game," *Workforce Management*, 85 (16), 1-25.

Schneider, B., White, S.S. and Paul, M.C. (1998), "Linking service climate and customer perceptions of service quality: Test of a causal model," *Journal of Applied Psychology*, 83(2), 150-163.

Taylor, S.L. and Cosenza, R.M. (1997), "Internal marketing can reduce employee turnover," *Supervision*, 58(12), 3-5.

Ueno, A. (2010), "What are the fundamental features supporting service quality?" *Journal of Services Marketing*, 24(1), 74-86

Wan, Y.K.P. (2010), "Exploratory assessment of the Macao casino dealers' job perceptions," International Journal of Hospitality Management, 29(1), 62-71.