

# Influence of Personal Factors on Macau Residents' Gaming Impact Perceptions

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## **Abstract**

This paper explores the influence of personal factors on gaming impact perceptions using Macau, China as a case study. The objective is to examine how residents' gaming perceptions were affected by (1) personal benefits received from gaming; (2) length of residence; and (3) demographic characteristics. The study also aims to assess the relative magnitude of influence exerted by each variable on gaming impact perceptions. All personal factors were found to contribute to differences in gaming impact perceptions among sub-groups of respondents. Regression analyses revealed that age, education and residence status had influence on gaming impact perceptions. Findings support that the theory of social exchange is at play in the shaping of perceptions of gaming impact among Macau residents.

**Keywords:** gambling; gaming impact; gaming perception; Macau; resident attitudes, personal factors

## **Introduction**

The expansion in Macau's gaming market and growth in revenue has been spectacular ever since the liberalisation of its gaming industry in 2002. This is attributed to the addition of several new casino hotel properties, beginning with Sands and Waldo in 2004, followed by Grand Emperor, Rio, Grand Waldo, Wynn and Galaxy Starworld in 2006, and Grand Lisboa, Crown and Venetian in 2007. The explosive development of new properties, coupled with serious efforts by existing casinos to renovate and a proliferation of specialty slot gaming centres, has transformed the backwater in the Pearl River Delta into one of the busiest hubs in the region. Considering land area, Macau is the world's most lucrative gaming market today, surpassing the Las Vegas Strip in 2006. Major economic and gaming indicators of Macau for the five year period since 2002 reveal not only a rapidly growing economy but a new gaming and entertainment mecca in the making (Table 1).

Macau has a population of 538,000 (Macau Statistics and Census Service, 2007). On a personal level, residents benefit from abundant job opportunities and a sharp rise in salaries and wages. The unemployment rate fell from 6.3% in 2002 to 3.8% in 2006 and dropped further to 3.1% in the second quarter of 2007. Monthly median income rose 43.3% over the last five years. Casinos are among the biggest and best employers in town, hiring around 16% of the total workforce and paying dealers around USD1625 a month which is more than double the median monthly income (Macau Statistics and Census Service, 2007).

However, in contrast to the glossy economic indicators, there have been growing concerns about the socioeconomic disruptions that this unprecedented growth has induced. The local community is feeling the pressure of infrastructure overcrowding, the fear of losing job opportunities to a growing foreign workforce - 42% and 64% increase in 2005 and 2006 respectively (Macau Statistics and Census Service, 2007), a widening gap between the haves and the have-nots, and rising living costs. A recent

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**Table 1. Major Economic and Gaming Indicators of Macau, 2002-2007**

Indicators	2002	2003	2004	2005	2006
Nominal GDP (MOP* billion)	54.8	63.6	83	92.8	114.4
Real GDP growth rate (%)	10.1	14.2	28.4	6.7	16.6
Per capita GDP (nominal value in USD)	15567	17805	22634	24316	28436
Unemployment rate (%)	6.3	6.0	4.8	4.1	3.8
Monthly median income (MOP)	4672	4801	5167	5773	6701
Gaming revenue (MOP* million)	23,496	30,314	43,511	47,134	57,521
Gaming employment	n.a.	n.a.	22900	30800	42600
Total employed population	200600	202600	219000	237500	265100
Gaming employment as % of employed population	n.a.	n.a.	10.46	12.97	16.07
Import labour	23444 (?)	n.a.	27736	39411	64673
Gaming tax as percentage of total government revenue	67.13	72.17	76.64	72.73	n.a.
Tourist arrival ('000)	11530.8	11887.9	16,672.6	18,711.2	21,998.1

\*USD1=MOP8.0215 as at September 7, 2007

Sources: Gabinete de Estudos e Estatísticas, Autoridade Monetária de Macau; Macau Gaming Inspection Bureau; Macau Statistics and Census Service; Macau Government Tourist Office

study comparing residents' gambling attitudes and concerns about gaming development between 2002 and 2007 showed that residents had become more reserved in their gambling attitudes and had more worries about gaming development (Vong, in press).

In recent years, there has been increased interest in the study of Macau's gaming industry from either a macro approach (Gu, 2007; Gu and Gao, 2006; Kale, 2007; Siu, 2006) or the perspectives of residents in terms of gambling attitudes and perceived impacts (Vong, 2004; Vong and McCartney, 2005) as well as gambling participation and problems (Fong and Ozorio, 2005). However, research on the influence of personal factors on gaming impact perceptions was scant. Macau is currently at a growth stage with new casino projects opening and visitor arrivals continuing to set new records. As the market consolidates and matures, changes in the business and work environment are expected to affect residents' perceptions of impacts. Constant monitoring of shifts in residents' perceptions, attitudes and general sentiments could provide useful information to devise pro-active strategies that alleviate or minimise negative impacts of gaming development. Ultimately, resident support is vital to the sustainability of any economic and development strategy. Such support will only be forthcoming when residents perceive that benefits outweigh costs of development, especially if these pertain to themselves.

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### **Factors Influencing Gaming Impact Perceptions**

Many theories and studies about gaming impacts have stemmed from the larger body of tourism literature. Just as past studies have documented how destinations go through tourism development cycles that attract changing resident sentiments at different stages, the host community of gaming forms dynamic perceptions about gaming impacts at different points in time. Vong and McCartney (2005) developed a Gaming Impact Perception Matrix to track changing resident perceptions of personal, social, and environmental costs and benefits brought about by gaming development over time. The Matrix consists of four quadrants that classify the respective impact perception into four types: High Cost–High Benefit; High Cost–Low Benefit; Low Cost–High Benefit; and Low Cost–Low Benefit. Correspondingly, the resident clusters were located in their respective quadrants and labeled as “Reserved Optimists,” “Skeptics,” “Optimists,” and “Neutrals”. However, such categorisation tends to change along with shifts in perceptions. Depending on cost-benefit perceptions formed at later stages of gaming development, “neutrals” could change to become “optimists,” “optimists” to “reserved optimists,” or “reserved optimists” to “skeptics.” The cycle could be reversed because the Matrix is dynamic and assumes progressively positive or negative change in resident perceptions over time.

Based on the tourism development impact literature, gaming impacts have been commonly classified into three main benefit and cost dimensions: economic, social, and environmental (Canneday and Zeiger, 1991; Carmichael & Peppard, 1998; Carmichael *et al.*, 1996; Eadington 1986; Kang *et al.*, 1996; Perdue *et al.*, 1995, 1999; Pizam and Pokela, 1985; Roehl, 1994; Spears and Boger, 2002). According to this view, one part of residents’ gaming perceptions is formed by the internalisation of their feelings and experiences related to the general change in the macro environment brought about by gaming development. The other part, however, is seen to be associated with personal factors such as income or employment benefits received from gaming (Eadington, 1986; Canneday and Zeiger, 1991; Lee and Back, 2006; Perdue *et al.*, 1999; Roehl, 1994), length of residence (Perdue *et al.*, 1995), religion (Ham *et al.*, 2004), and demographic characteristics (Spears and Boger, 2003). The theory of social exchange has been much referred to in the context of gaming impact perceptions. The theory postulates that the more dependent a person or community is on tourism development, the more positive their attitudes are toward tourism development, and vice versa. The theory found support in studies that demonstrated a positive relationship between personal benefits, positive perception of quality of life, and support for gaming (Lee and Back, 2003; Perdue *et al.*, 1995, 1999).

A review of studies done in the last five years on gaming impact indicates a continued interest in exploring associations between personal factors and gaming perceptions and attitudes. Hsu (2000) reported that residents’ support for legalised gaming and perceived impacts of Iowa and Illinois riverboat casinos between 1993 and 1998 had declined because of an undesirable lag in the realisation of benefits to the community. Lee and Black (2003) found that both positive and negative economic factors showed significant impacts on support when residents actually

received benefits. However, environmental impact did not significantly predict either the benefit or support level in post data. In a later study, Lee and Black (2006) reinforced that benefits was the most important indicator in resident’s support for casino development in South Korea two years after a casino opened. In Ham *et al.* (2004), residents who did not believe that jobs created by casinos would improve their standard of living showed a lack of support for such casino development. Chhabra and Gursoy (2007) examined the race and educational attainment variations on resident perceptions and support for casino development. Their findings showed that residents who were likely to receive personal benefits from gambling development tended to believe that its socioeconomic

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benefits outweighed the costs. Race was also a significant influence on cost and benefit perceptions.

Past studies had generated useful measurement scales for examining gaming impacts (Carmichael *et al.*, 1996; Jurowski *et al.*, 1997; Kang *et al.*, 1996; Pizam & Pokela, 1985). Based on the work of the forerunners, recent studies on measurement scales for gaming impacts included Chen and Hsu (2001), Spears and Boger (2002), Lee and Back (2006) and Kang *et al.* (2007). The commonality of all these scales rests in the confirmation of the three core gaming impact domains (economic, social and environmental) while exhibiting a certain degree of variance in the number of statements used for each category and hence the resulting factor structures.

### **Purpose of the Study**

This paper explores the influence of personal factors on gaming impact perceptions using Macau as a case study. The objective is to examine how Macau residents' gaming perceptions were affected by (1) personal benefits received from gaming; (2) length of residence; and (3) demographic characteristics. The study also aims to assess the relative magnitude of influence exerted by each variable on gaming impact perceptions. The information is useful for understanding the shaping of gaming perceptions from a micro-perspective and the relative importance of the various personal factors at play.

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### **Methodology**

#### *Instrument*

A survey questionnaire in both Chinese and English versions was used. Section 1 solicited respondents' feedback on perceived impacts of gaming development. The impact statements were adopted from Spears and Boger (2002) with slight modification. Statements were measured on a 5-point Likert scale, running from 1 "totally disagree" to 5 "totally agree". Section 2 queried respondents regarding their length of residence and changes in personal income. The last part collected demographic data of the respondents. A pilot test was conducted to ensure the questions were relevant and clear to respondents. The pilot run used randomly selected Macau telephone numbers, reaching 50 respondents. The questions were considered clear and relevant.

#### *Sampling*

The administration of the questionnaire took place in March 2007, using modified random digit dialing. The sample size was determined to be 450. Only Macau residents were interviewed. The person whose birthday was the next and who was older than 18 years old was asked to answer the questionnaire. The interviews were intentionally spread over weekdays, weekends, and different periods of the day. The interviewers were instructed to make up to 5 attempts for each number, after which a new number would be selected. After 914 attempts, 495 useful responses were obtained, representing a response rate of 54%.

### **Results**

#### *Sample Characteristics*

The second quarter of the 2007 Macau population statistics indicated a male to female ratio of approximately 1:1 (Macau Statistics and Census Service 2007). However, the current sample showed a substantial deviation in gender distribution from the population, with almost 65% female. Therefore, the sample was weighted according to the age and gender mix of the Macao population in 2007 reported by the Macau Statistics and Census Service (2007). The weighted and unweighted sample compositions are shown in Table 2. In the weighted sample, the majority of the respondents (68%) were

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married and around the same percentage (61.3%) had attained high school education. There was a fair distribution of respondents (18 to 21%) in the age categories between 18 to 54 years old. The elderly respondents (above 55 years old) made up 19.3% of the sample. An obvious change was noted in the income structure, with a significant percentage of respondents entering a higher income range (MOP5,001 – 10,000) ( $\chi^2=160.31$ ,  $p<.001$ ), compared to samples of Macau residents in similar studies conducted in the previous years. This change was due to a general shortage of manpower in Macau that had led to spiraling wages.

**Table 2. Sample Characteristics (N=495)**

	Unweighted %	Weighted %		Unweighted %	Weighted %
<i>Gender</i>			<i>Marital</i>		
Males	35.2	49	Single	32.3	32
Females	64.8	51	Married	67.6	68
<i>Age</i>			<i>Education</i>		
18-24 years	22.7	20.9	Primary or below	17.8	20.4
25-34	16	18.4	High school	63.4	61.3
35-44	26.7	21.1	College or Postgraduate	18.8	18.2
45-54	22.9	21.3			
55-64	7.7	10.2			
65+	4.0	8.1			
<i>Monthly</i>					
<MOP5000	15.6	13.1			
5001-10000	46.7	46.1			
10001-15000	24.2	26			
15001-20000	7.6	8.0			
>20000	5.9	6.7			

\*USD1 = MOP8.032 as of September 7, 2007

**Results**

*Gaming Impact Perception Factors*

Gaming impact perceptions were measured by 20 statements on a 5-point scale, ranging from 1 “totally disagree” to 5 “totally agree”, with an introductory question asking how much respondents agreed to the statements. A preliminary inspection of the descriptive statistics revealed that the respondents agreed most that there had been an increase in overcrowding, prices, and employment opportunities. They disagreed most that public security had improved (Table 3).

**Table 3. Principal Components Analysis of Gaming Impact Perceptions**

	Mean	SD	Loading	Eigen	% Variance	Alpha
	N=495			value	Explained	
<i>Economic Benefits</i>				1.00	7.85	.51
Employment opportunities have increased	4.04	.76	.73			
Overall economy has improved	3.83	.92	.72			
Quality of life has improved	3.23	1.09	.55			
<i>Economic Costs</i>				1.19	9.63	.64
Prices have increased	4.14	.89	.77			
Property price has increased	4.03	1.01	.71			
<i>Entertainment and Recreation Benefits</i>				1.73	10.42	.71
Variety of restaurants increased	3.82	.92	.64			
Variety of entertainment increased	3.52	1.04	.75			
Recreational opportunities have increased	3.43	1.06	.78			
<i>Public Service Benefits</i>				3.23	12.43	.73
Image of community has improved	3.42	1.06	.48			
Quality of public utilities have improved	3.21	1.07	.72			
Quality of public service has increased	3.13	1.09	.79			
Opportunity to meet people has increased	3.04	1.08	.42			
Public security has improved	2.58	1.03	.71			
<i>Environmental Costs</i>				4.10	15.90	.81
Overcrowding has increased	4.15	.91	.56			
Traffic condition has worsened	3.99	1.08	.45			
Air pollution has increased	3.94	1.05	.83			
Crime rate has increased	3.90	1.00	.38			
Noise pollution has increased	3.78	1.08	.82			
Litter has increased	3.42	1.18	.68			
Water pollution has increased	3.26	1.19	.76			
Total					56.23	

A principal components analysis with Varimax rotation was conducted to compress the items into fewer manageable factors (Table 3). Negatively phrased statements were reversely coded before the analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.81 and the Bartlett's test of sphericity was significant. Five factors with eigenvalue larger than 1 were extracted. Altogether the five factors explained 56.23% of the variance. Reliability tests show that all factors had internal consistency at a satisfactory level, ranging from 0.51 to 0.81.

The five factors were consistent with conventional classification in the literature: Economic Benefits (factor 1), Economic Costs (factor 2), Entertainment and Recreation Benefits (factor 3), Public Service Benefits (factor 4), and Environmental Costs (factor 5). Factors 3 and 4 combined could represent the conventional "social benefit" dimension. Since the present scale did not include items measuring negative impact on a personal level such as gambling addiction, substance abuse and family problems, the analysis did not generate any factor on this level. Instead of averaging the scores of all items within each factor for each respondent for subsequent analysis, weighted sums of the items were calculated by multiplying each respondent's rating on each item by the item's factor loading, with the objective of increasing statistical sensitivity. The weighted sums thus derived were then averaged by the sum of item loadings for each factor to arrive at standardized scores ranging from 1 to 5, to make comparison possible among respondents.

#### *Influence of Demographic Characteristics on Gaming Perceptions*

Analyses of variance among subgroups of different gender, age, education and marital status were conducted. Tukey's test was used to discern differences among subgroups. Results showed that except for gender, all other demographic variables were associated with some differences in gaming impact perceptions (Table 4). Married respondents perceived more than singles that environmental costs had increased. This is perhaps due to heightened sensitivity to environmental and health issues among people who have family responsibilities. The level of agreement with an improved economy was found to rise steadily with increase in education, indicating advantage in job search and career advancement for those with higher formal qualifications. However, a reverse relationship was observed between education and the perception of public service benefits. Younger respondents (18 to 24 years old) did not perceive as much as those in other age groups that environmental costs had increased. Respondents aged between 25 to 34 years old agreed significantly less than other respondents that public service had improved. Although findings revealed a few significant differences in gaming impact perceptions among certain demographic subgroups, it would prove a stronger case of demographic influence on gaming impact perceptions if more significant differences were detected.

#### *Influence of Residence Status on Perception of Gaming Impact*

In Macau, permanent residence may be granted to those who have resided in the city for over seven years and fulfilled other official requirements. Imported skilled workers are not granted permanent residence despite having lived and worked in Macau for the required length. Recently, there has been some discussion in the community about a lack of job opportunities for new immigrants despite increasing job vacancies in the tourism, hotel and gaming sectors. An independent samples *t* test was conducted to discern differences in gaming impact perceptions between permanent and non-permanent residents (Table 5). The two groups differed significantly only in their perception about Economic Benefits. Both non-permanent ( $m=3.44$ ,  $sd=0.87$ ) and permanent residents ( $m=3.76$ ,  $sd=0.64$ ) agreed that the economy had improved. However, non-permanent residents agreed significantly less so than permanent residents ( $t=-1.76$ ,  $p<0.05$ ).

Inspecting the individual economic benefits statements, it is found that although both non-permanent residents and permanent residents agreed that job opportunities had increased ( $m=3.47$ ,  $sd=1.17$ ;  $m=4.07$ ,  $sd=.73$ ), the former's level of agreement was significantly lower ( $t=-3.76$ ,  $p<0.001$ ). This lends support, to a certain degree, to the claim that job opportunities for non-permanent residents were not the same as for permanent residents. Some attributed this to the relatively lower education attainment of new immigrants and the advantage that permanent residents have in their social networks. However, when interpreting the results, one has to note that the sample contained only 24 non-permanent residents. A larger subset of non-permanent residents would be desired for more conclusive findings.

**Table 4. Differences in Gaming Perceptions among Demographic Subgroups**

		N	Environmental Costs	Public Service Benefits	Entertainment and Recreation Benefits	Economic Costs	Economic Benefits
Gender	Male	242	3.70	3.00	3.59	4.08	3.70
	Female	252	3.79	3.11	3.57	4.10	3.78
	<i>t</i>		1.31	-1.53	0.27	0.21	-1.22
Marital Status	Single	158	3.50	2.98	3.50	4.02	3.82
	Married	336	3.86	3.01	3.61	4.12	3.70
	<i>t</i>		4.85**	-1.48	-1.40	1.20	.01
Education	Primary	101	3.86	3.22	3.58	4.03	3.60
	High school	303	3.70	3.05	3.59	4.06	3.74
	College	90	3.76	2.87	3.52	4.22	3.88
	F		1.74	5.42**	0.33	1.58	4.35**
Age	18-24	103	3.39	2.97	3.46	3.88	3.81
	25-34	91	3.78	2.80	3.43	4.16	3.88
	35-44	104	3.85	3.14	3.65	4.15	3.72
	45-54	105	3.80	3.11	3.67	4.13	3.60
	55-64	50	3.79	3.23	3.73	4.07	3.65
	Above 65	40	4.08	3.27	3.61	4.20	3.78
	F		6.77***	4.02**	1.89	1.82	2.30*

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001



**Table 5. Gaming Impact Perceptions by Residence Status**

Gaming Impact Perception	Permanent residents (N=470)	Non-permanent residents (N=24)	t
Factors	Mean (SD)	Mean (SD)	
Environmental Costs	2.25 (.77)	2.39 (.89)	0.89
Public Service Benefits	3.06 (.74)	3.00 (.70)	-0.39
Entertainment and Recreation	3.58 (.95)	3.48(.80)	-0.60
Benefits			
Economic Costs	1.90 (.80)	2.24 (1.16)	1.44
Economic Benefits	3.76 (.64)	3.44 (.87)	-1.76*

\*p<0.05

*Influence of Personal Income Change on Gaming Perception*

There were four questions in the section on personal income. The respondents were asked when they had last changed jobs, when they had last been promoted, and the most recent percentage increase or decrease in salary. The data on salary change for those respondents who had changed jobs or obtained a promotion in the last five years (beginning from 2002 when the local gaming sector was deregulated), as well as those respondents who never had experienced any change in salary, was used for further analysis. It should be noted that 37% of the respondents did not respond to the question on salary change. The effective sample was divided into two groups. Group A consisted of those respondents who had no change or a decrease in income. Group B consisted of those who had salary increase. Because of the current labour shortage in Macau, over half of the respondents (66.7%) who revealed their status of income change reported an increase in income in the last five years. T-tests were applied to discern differences between these two groups in gaming perceptions. Results did not show significant differences in the five gaming impact perception factors. However, further t-tests on the individual gaming impact perception items revealed that Group B agreed less than Group A that quality of public services had improved (t=2.02, p<0.05) and felt that traffic had worsened (t=2.19, p<0.05).

*Assessing the Relative Influence of Different Personal Factors*

Five regression analysis models were used to determine the relative influence of demographic variables (age, gender, education, marital status), years of residence, and income change on gaming impact perceptions. The gaming impact perception factors other than the one used as the independent variable in each regression were also included in the analysis in order to capture the mediating effect of these variables. Dummy variables were used for all categorical variables. Three models were significant at p<0.05. Findings revealed that age, education and residence status had influence on gaming impact perceptions (Table 6). Young age (aged 18 to 34) had a positive influence on perceptions of economic benefits while older age (45 to 54) had a positive influence on perceptions of entertainment and recreation benefits, possibly due to respondents' having more time for leisure and therefore were relatively more aware of new entertainment and recreation opportunities presented by casinos and hotels. Education had influence on perception of public service benefits. Respondents with primary education background had positive perception while those with tertiary background had negative perceptions. Residence status was found to have influence on perceptions of economic benefits, with

non-permanent residence status corresponding negatively to such perceptions. Regression results also revealed that all gaming impact perception factors had significant influence on one another.

**Table 6. Regression Analysis of Gaming Impact Perceptions by Personal Factors**

Gaming Perception Factors	F*	Adjusted R square	Significant independent variable	Standardised Beta*
1 Economic Benefits	14.24	.29	Age 18 to 24	.23
			Age 25 to 34	.21
			Non permanent resident status	-.082
2 Public Service Benefits	13.63	.28	Primary education	.65
			Tertiary education	-.62
3 Entertainment and Recreation Benefits	11.58	.24	Age 45 to 54	.14

\*all significant at p<0.05

*Who Benefits in Macau’s Gaming Development?*

Cross-tab analyses were conducted to associate income change and demographic characteristics. However, age, gender, education and marital status did not show significant differences between the two groups. Visual inspection showed that there were more respondents in Group B earning a monthly income between MOP10,001 to MOP15,000 and above MOP20,000 (chi=15.38, p<0.01). Looking at occupation, Group B consisted of more respondents belonging to “management”, “technical”, “skilled”, “student”, and “domestic” categories. Further inspection revealed that Group B respondents were working mostly in finance, transportation, storage, communication, construction, and gaming sectors. On the contrary, Group A consisted of more “unskilled” and “unemployed” respondents. Interestingly, this group also had more “professionals” (Table 7).

Assimilating the results above and referring to the current labour market situation in Macau, it is likely that most of Group B respondents were (1) dealers or equivalent technical position incumbents in the gaming industries; (2) coach and limousine drivers who were in great demand since the opening of several big casino hotels; (3) engineers and technicians in the construction field working on new casino projects; (4) administrative and accounting personnel in various industries; and (5) the much sought after senior management professionals. Students and homemakers reported an increase in income probably because of more part-time work opportunities. As for those “professionals” who did not have an income increase, it is likely that they were working in industries not directly related to the booming tourism and gaming areas or were self-practicing doctors, dentists and lawyers, teachers, civil servants and other professionals.

**Table 7. Occupation of Respondents in Groups A and B (N=309)**

	Group A (%) (N=103)	Group B (%) (N=206)	Total (%)
Management	0.00	3.25	2.19
Professional	10.08	8.54	9.04
Technical	12.61	15.04	14.25
Skilled	16.81	19.51	18.63
Unskilled	18.49	10.57	13.15
Student	11.76	13.82	13.15
Domestic	10.92	15.45	13.97
Unemployed	15.13	8.13	10.41
Self-employed	4.20	4.47	4.38
Others	0.00	1.22	0.82
Total	100.00	100.00	100.00

Note: Group A consisted of those respondents who had no change or a decrease in income in the last five years. Group B consisted of those who had salary increase.

### **Discussion**

This paper explored the influence of personal factors on perceptions of gaming impact using Macau as a case. In this study, personal factors included demographic characteristics, length of residence, and change in personal income. The data generated five gaming impact perception factors that fell under the conventional economic, social and environmental domains. All personal factors were found to contribute to certain differences in gaming impact perceptions among sub-groups of respondents. Looking at differences among demographic sub-groups, married respondents perceived more than singles that environmental costs had increased. The level of agreement with an improved economy was found to rise steadily with increase in education but a reverse relationship was observed between education and the perception of public service benefits. Younger respondents (18 to 24 years old) did not perceive as much as those in other age groups that environmental costs had increased and those between 25 to 34 years old agreed significantly less that public service had improved. Non-permanent residents found job opportunities less available compared to permanent residents.

In the analysis of differences between respondents who reported an income increase and those who did not in the last five years, the former agreed less that quality of public services had improved and felt that traffic had worsened. Regression analyses revealed that age, education and residence status had influence on gaming impact perceptions.

Overall, the findings support that the theory of social exchange is at play in the shaping of perceptions of gaming impact among Macau residents. There are certain privileged groups of workforce that are enjoying personal benefits from gaming development and therefore have developed either more positive perceptions about or higher tolerance for the various impacts of gaming development. The findings further support the arguments in Vong and McCartney (2005) that gaming perception impacts were multidimensional which included the personal factor, as well as results reported

in previous studies that associated gaming impact perceptions with personal factors (Eadington, 1986; Caneday and Zeiger, 1991; Roehl, 1994; Perdue *et al.*, 1995; Perdue *et al.*, 1999; Spears and Boger, 2003; Ham *et al.*, 2004; Lee and Back, 2006).

One important implication for policy makers is that there are limitations in the interpretation of community well-being by analyzing macro economic indicators, such as GDP, GDP per capita, gaming revenue, employment rate and median income, alone. It is also necessary to incorporate “soft” indicators such as residents’ perception of how gaming development has induced changes – for better or for worse – in their personal, economic, social and environmental spheres. A combination of hard data and “soft” indicators can better reflect the overall quality of life experienced by the community. It is not uncommon for communities to suffer a decrease in the quality of life amid economic development, as observed in some aspects of Macao’s development, for example, property prices have risen beyond the purchasing power of an average resident, fraud and petty thefts associated with casino employees have become more evident, traffic congestion has worsened, and environmental conditions have deteriorated.

On an optimistic note, the situation could be reversed or even improved with proper strategies or policies. To be able to do this, policy makers have to understand what went right or wrong from the perspective of residents, controlling for personal benefits. It is understood that sometimes there are no quick fixes for problems, considering the lag time required in new policy implementation or infrastructure development. Nonetheless, constant consultation with community groups can at least vent some frustration and negative sentiments.

The ultimate measure of success of any development policy depends on (1) whether benefits outweigh costs; and (2) whether such benefits are shared by the wider population so that there is tangible improvement of their personal well-being. Wealth redistribution is a way of channeling benefits to those who, in normal circumstances, would be the last to enjoy benefits as they trickle down from the privileged strata of the society. Recent examples of wealth redistribution policies in Macao include increasing subsidies to elderly and socially disadvantaged groups (the physically or mentally challenged, single-parent families, and families with members requiring long-term medical attention), revising public housing policies and offering interest rate and tax reduction to relevant social groups. A larger budget has been reserved for training and education to help local residents advance in the workplace. Nevertheless, political wisdom and tact are required in determining the boundary between a “fair” and a “welfare” society.

### **Limitation**

The gaming impact perception scale used did not include items measuring negative impact on a personal level such as gambling addiction, substance abuse and family problems. Therefore, the study was not able to assess the influence of income change, demographic characteristics and length of residence on the perception of personal costs. The measurement items for social costs could also be extended. In addition, the measure for personal benefits included only a single item on income change. Future research could consider using a multi-item instrument that covers aspects of job opportunities, new social networks, and exposure to multicultural work environment among other personal benefits.

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