

# An Empirical Study on Environmental System Perception of Tourism Island Residents: A Case Study in Hainan Island

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***Abstract:** Today the development of island tourism has attracted more and more attention from domestic and international tourism researches. Tourism island has become the important scenic spot in coastal cities in China. Through the empirical research of local residents' awareness of environmental system, we can better hold people's perception of the touristic environment. Method can also be drawn to promote public participation more actively in the tourism development of the islands. This paper mainly shows the residents' attitude towards tourism through their feelings of the changes of economy, local social culture and the island environment brought by tourism. The results show that residents' positive perception of tourism is more intense than negative perception, and the perception of economy is stronger than that of culture and environment. On the overall perception, there exists no significant difference while in the tiny level there are still some differences remained.*

***Keywords:** Environmental system perception, Island residents, Hainan Island, Differences.*

## Introduction

With the development of economy, people's quality of life has experienced an unprecedented increase currently. As a result, more and more people begin to pursue material and spiritual enjoyment which stimulates the development of tourism. As an extension of the seaside tourism development, island tourism research has been listed as one of the important fields in tourism research at home and abroad [6]. Island residents are an important part of the whole tourism industry development, therefore, residents' perception of environmental system is particularly important. Since the 1970s, regional economy, social culture and environment impact of tourism research is the main content of tourism research in foreign countries. Tourism development stage theory, social exchange theory, tourism carrying capacity theory, tourism life cycle theory, tourism dependency theory have been proposed in succession, many of which come from viewpoint of local residents perception in research [5, 13].

In this study, tourism island residents will be divided into the following categories: indifferent supporting type, actively supporting type and rational supporting type. The indifferent supporting type are mostly elder residents with long dwelling time who rely less on the tourism industry; the actively supporting type are those with tourism-related jobs or someone in their family takes tourism as a livelihood, that is to say, proportion of the primary household income mostly comes from tourism; rational supporting type are made up by people with higher literacy who have a more profound understanding on tourism and the effect it brings.

As time goes on, the attitude of the residents towards tourism is changing. The initial welcome is gradually evolved into indifference, boredom and even resistance. This is because these resources are consumed continuously over time. As residents' tourism investment costs are greater than the benefits of tourism, their attitude will change accordingly.

The island tourism is still in the growth stage in our country. The unique "4S" feature (sunshine, sea coast, sea water, seafood) and religious culture both have attracted the attention of Chinese and foreign tourists. However, there are scarcely any empirical studies on the tourism effect on island residents and residents' attitude towards tourism development. Therefore, this paper through the environmental awareness investigation on Hainan island residents, carried out an analysis from three aspects as economy, social culture and environment and tried to answer these questions.

## Respondent introduction

### *Concept of tourism island*

Island tourism is an extension of the seaside tourism in recent years and it is a kind of coastal and marine tourism including the activities of the coast, sea and seafloor. The development project of an island is limited by the island's natural environment, resource conditions and development efforts.

Sea island tourism destination is one "resource type" tourist destination which is more widely distributed in inland coast. It is surrounded by the sea. Based on the island, sun, sea and beach are taken as the main content. According to its unique ecological system and cultural system, certain natural landscape and human landscape are built to meet the needs of people's spiritual and material enjoyment [9, 11].

### *General situation of Hainan island*

Hainan island (Fig. 1) is China's only tropical island which is known as "One of the few pieces of pure land not contaminated". Vegetation covers more than 50% [4] on the island with ever-green flowers which is suitable for tourism all the year round. Unique island scenery and unique ethnic customs let it become a famous tourist resort in China. Tourists in Hainan Province in 2012 reached 33.2037 million and tourism revenue is RMB 37.9 billion yuan.



Fig. 1 General situation of Hainan island

There are three reasons why Hainan tourism island attracts so many visitors:

1. The special geographical position: Hainan island is located in the south China sea which is cut off from land. It is an isolated island on the sea, so it can bring people different senses and visual stimulation.
2. The unique natural environment and humane environment: Because the area is cut off from the land, climate and living habit result in a living environment different from the land. Hainan island is inhabited by 37 nationalities who still keep their customs and habits and can leave tourists with different feelings [10].
3. It meets the demand of modern people on life: With the change of social economy and structure, the pressure people bear is becoming heavier and heavier. As a result, more and more people chose to use tourism to relieve stress. Through tourism, people seek the ease of preserving one's health or stimulation of adventure. The uniqueness of island ecological diversity and cultural environment make it emerge from traditional tourist destinations. It can not only satisfy people's pursuit of adventure but also enable them to relieve mental stress facing with the unmeasured vastness of the sea [7].

## Survey methods and results

### *Survey methods*

This paper applied the on-the-spot questionnaire method. By means of a questionnaire, we obtain island residents' perception of tourism impact. The choice of respondents is shown from the economy, culture and environment aspects.

Using a sampling survey method, the investigation areas are mainly focused on Wanning scenic spot. Administrative area is involved with Simon Street, Bandung Street and Hongzhuan East Street, while tourist area involving DongShanLing scenic spot, Xinglong tropical garden scenic spot and Southeast Asia style village. 400 questionnaires were issued with recovery of 374 and the recovery rate was 93.5%. There are 336 effective questionnaires, accounting for 84% of the total questionnaires. The distribution of effective samples are as follows: 48 copies of Simon street, 83 copies of Bandung street, 45 copies of Hongzhuan East Street, 41 copies of DongShanLing scenic spot, 55 copies of Xinglong tropical garden and 74 copies of Southeast Asia style village, as shown in Table 1. Survey content includes the basic situation of Hainan island residents and their perception of island tourism impact.

### *Survey result*

Effective sample in this survey includes 5.6% of farmers, 8.5% of people working in the government unit, 14.1% of students, 16.2% of people engaged in production work and 55.6% of the other occupations (Fig. 2). With 49% of men surveyed and women accounted for 51%. People surveyed are between the age of 20-50. 62.2% of respondents lived for more than 25 years on Hainan Island.

The age and gender of the investigators are uniformly distributed, suggesting that it is controllable for different views of people of different age and gender. There will be no remarkable differences but still differences in subtle.

Among the respondents, residents with cultural literacy of university and above accounted for 21.1%, high school (including technical secondary school) and above accounted for 40.1%, while junior middle school under is about 38.7%. The illiteracy and people read less accounted for 2.2%. Compared with the statistical yearbook of Hainan Province, the respondents are with

relatively high cultural literacy which is very helpful for their understanding towards Hainan island tourism impact and feedback of the questionnaire.

Table 1. Content style of questionnaire

Subject matter	Detailed content
Basic information	Age, gender, profession, educational level, family income.
Island residents' perception of the tourism economic impact	Driving the development of economy, changing economic structure, improving the employment opportunities and service level of service trade. It makes families rely on tourism income and has an impact on commodity prices and land prices as well as polarization between the rich and the poor.
Island residents' perception of the tourism cultural environmental impact	Increase awareness, promote local culture, promote the protection of cultural relics and mandarin. Rise of social crime, corrupt social conduct, and deterioration of interpersonal relationship.
Island residents' perception of the tourism environmental impact	Improve the traffic environment, increase the government and the residents' environmental awareness. Increased leisure facilities cause the pollution of the sea and beach, environmental degradation, and the destruction of the island nature and original building, destroy a quiet life environment of the island residents.

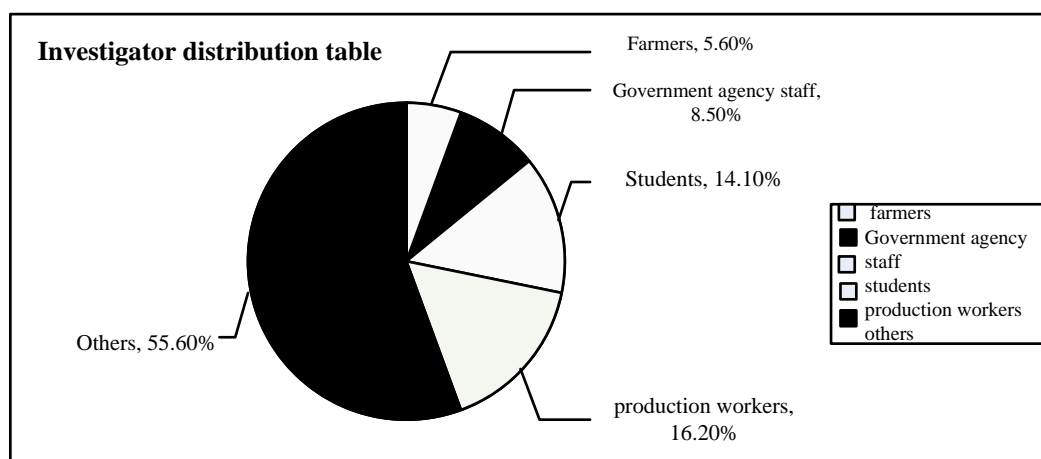


Fig. 2 Distribution of respondents

### Island residents' awareness of environmental system

#### *Island residents' awareness of tourism economic impact*

Hainan island tourism development is at the growth stage. It can be learned from the survey that island residents showed the uncertainty on whether tourism plays a leading role for local economic development and change structure of the local economy (Fig. 3). Only 49.3% of people believe that the local economy can be developed through tourism, another 50.7% held reservations about this question. 56.9% of people believe that rely on tourism we can change

the single economic structure, but there are still 43.1% of residents expressed different attitudes. Among which most residents presented positive views that tourism can promote the development of service industry. And because of the development of the tourism island is still at the early growth stage, associated effect of tourism is presented more on catering, accommodation and transportation. For the vast majority of the residents, economic interest obtained from tourism is rare. It can be seen from the following table that 62.7% of residents think that tourism development can make the price and land price rising, which shows the great concern of the residents. All in all, residents' positive perception of tourism impact is very strong [3].

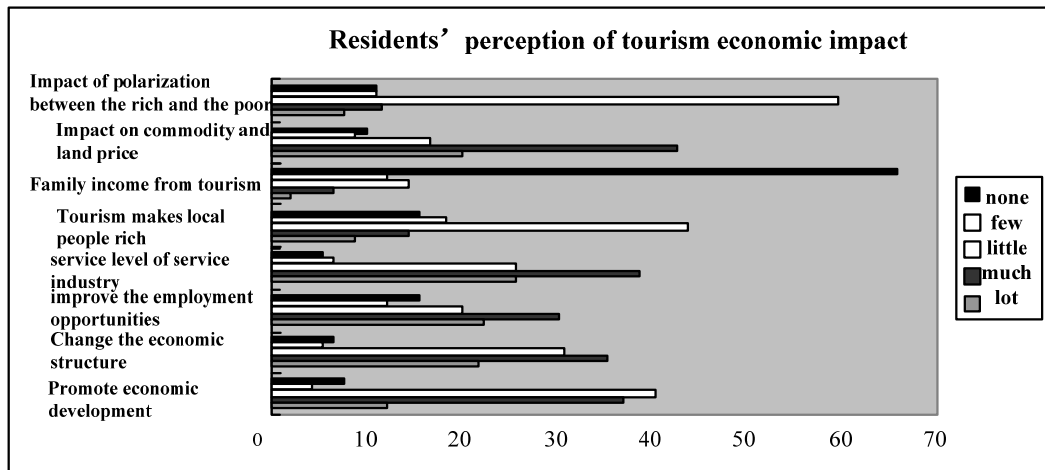


Fig. 3 Residents' perception of tourism economic impact

*Residents' perception of tourism cultural environmental impact*

In the survey, when asked whether tourism has improved the local public awareness [12, 16], 64% of people showed positive attitude, suggesting a high cognitive level of the local residents to believe that tourism industry plays a strong propaganda role. In addition, the residents maintained a relatively positive perception and attitude towards that tourism can promote and protect the local culture and promote the mandarin, with proportion of three aspects respectively as 72.2%, 58.7% and 68.4%, as shown in Fig. 4.

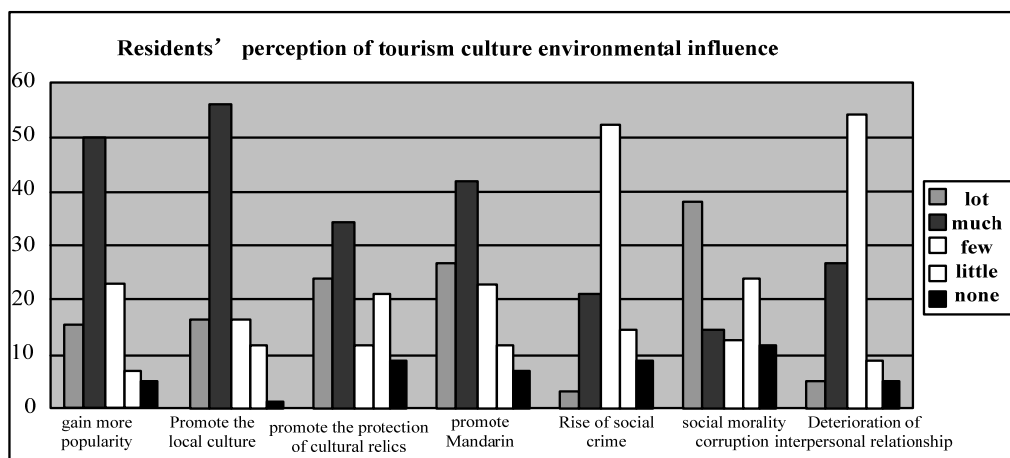


Fig. 4 Residents' perception of tourism culture environmental influence

As it can be seen from the market analysis, most of the island residents are very hospitable which suggests that local residents expressed welcome to the development of tourism and have

a very big psychological expectation on tourism. But it is not hard to see from the table that they had a different degree of anxiety about the bad atmosphere in society brought by tourism. There are only 9.3%, 11.3% and 4.8% of people respectively who believe that tourism will not lead to problems of social crime increase, ethos corrupt and interpersonal relationship deterioration. As a result, Hainan tourism policy makers and managers must be good at discovering and carrying forwards the local traditional culture and set up a civilized, fair and harmonious society to minimize the adverse impact of the society.

### Residents' perception of tourism environmental impact

The survey shows that residents have a very strong perception on positive impact on the environment brought by tourism. The development of Hainan island tourism improved the local transportation, increased government's investment of environmental protection and recreation facilities, which make people have more leisure opportunities with a proportion accounted for 57.5%, 54.1% and 60.9% respectively, as shown in Fig. 5.

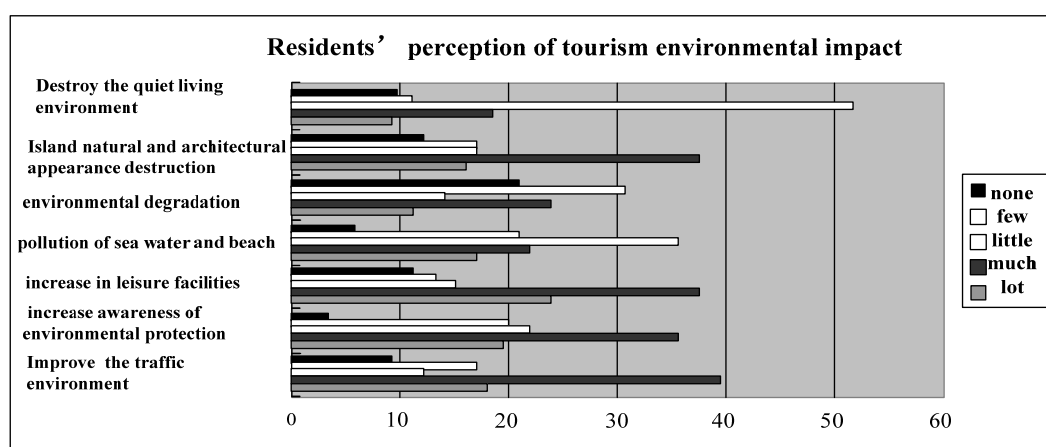


Fig. 5 Residents' perception of tourism environmental impact

However, for the negative impact brought by tourism to local environment, the local island residents have different feelings. There are 38.5% of residents who hold the view that tourism can bring pollution to the sea and beach while 34.7% feel environmental degradation. Still, there are a large part of the residents who think that pollution brought to the environment by tourism is relatively small. On the other hand, the residents show great concern for the damage of island's natural environment and architectural appearance caused by tourism. It can be seen in the survey that 53.6% of the island residents believe that large destruction had been brought due to the increase of tourist facilities. We also found that 72.4% of residents think that the influence of the development of tourism to their quiet life is not very big. This may be because of the distance between Hainan island tourist attractions and where the island's residents live. Therefore, visitors flow rate does not have impact on the residents' life. In conclusion, the island residents hold optimistic state of mind to environmental positive impact of tourism while their perception of negative effect is far below the perception of positive impact.

### Analysis of the cognitive differences

In this survey, we applied the factor analysis module from SPSS statistical software.

First of all, we carried out Bartlett's Test of Sphericity of the Kaiser-Meyer-Olkin (KMO) [8] statistics to inspect whether it is suitable for factor analysis. Then, extraction of factors is performed by principal component analysis. The default SPSS characteristic value is greater than 1. Varimax rotation method is selected for factor loading matrix orthogonal rotation in

order to highlight the practical implications of each factor, then to analyze the final output results.

Synthesize questionnaire to a sample for factor analysis, the results are as follows: KMO = 0.702, Bartlett ball inspection concomitant probability  $P = 0.00$ . Generally considered, KMO value between 0.7 and 0.8 is suitable for factor analysis. Bartlett ball inspection concomitant probability value is less than 0.05, suggesting correlation between variables which is suitable for factor analysis. Under the condition of eigenvalues greater than 1, total extraction of four factors are made through SPSS. The results are shown in table of factor extraction and factor rotation (Table 2). We can find that the four factors explained about 57.9% of the total variance.

Table 2. The result of factor extraction and factor rotation

Different groups	Initial variance contribution			Variance loading after the rotation		
	Characteristic value	Differential contribution of each factor, %	Cumulative contribution, %	Characteristic value	Differential contribution of each factor, %	Cumulative contribution, %
1	6.812	32.440	32.440	6.812	32.440	32.440
2	2.506	11.934	44.374	2.506	11.934	44.374
3	1.753	8.349	52.724	1.753	8.349	52.724
4	1.091	5.195	57.919	1.091	5.195	57.919

The actual meaning of each factor can be expressed more clearly by factor loading matrix orthogonal varimax rotation and the scale of each factor represented by the index of reliability test. It can be seen that the first factor has a higher load on question 1, 2, 3, 8, 9, 10, 11, 13, 14, 16 and 18 and is called as positive impact factor. While the second factor in question 4 and 5 has higher load and is called as demographic factors perception factor. There is a higher load in question 6, 7, 12, 15, 17 of the third factor which can be named as negative impact factor. The fourth factor shows high load in the question 19, 20, 21 and can be named as overall impact factor. The factor loading expression is shown in the Table 3.

With the above four factors to replace the original 21 survey projects to make a statistical analysis so as to analyze the difference between them on “Positive, negative, population, the overall impact” factors.

To illustrate the research methods of this paper by comparing whether there is a difference between different residents on positive perception factor [2]. We adopt Levene  $F$  method first to make inspection on the two population variance. According to the clustering analysis, the concomitant probability of  $F$  is 282 which is greater than the significant level 0.05, so we cannot refuse to equal variance assumption. Therefore, we need to apply mean clustering analysis of variance of homogeneous  $t$ ,  $t = -5.827$ . The concomitant probability  $P = 0.00$  which is less than a significant probability level 0.05, thus refuse  $t$  test null hypothesis; in other words, there exist differences between two groups of different professions on social perception factor.

Industry perception difference comparison chart is drawn as shown in the Fig. 6 based on the Table 4.

Table 3. Load factor and average value

Positive impact factors		Factor load	Energy charge	
	$F_1$	$F_2$	$F_3$	$F_4$
<b>Positive impact factors</b>				
1. To attract foreign capital, promote the development of economy	0.558			
2. Tourism provides more job opportunities	0.717			
3. More and more residents earn money	0.793			
8. The arrival of tourists make the island revive	0.713			
9. Residents won the foreign cultural exchange and learning opportunity	0.689			
10. Tourism let more people know of Hainan island	0.799			
11. Feeling proud	0.830			
13. Protect the island features of folk culture	0.663			
14. Promote the island the improvement of the infrastructure	0.681			
16. Improve the government to protect the environment	0.500			
18. Make island residents pay more attention to spiritual civilization construction	0.774			
<b>Demographic factors perception factors</b>				
4. More and more foreigners came to the island		0.588		
5. Tourism is just make a few household income increase		0.556		
<b>Negative impact factors</b>				
6. Tourism destination's money have made by foreign residents			0.511	
7. Disrupted the original life, brought inconvenience to daily life.			0.428	
12. Deterioration of human relationships, fight theft happen very often			0.715	
15. Island environment quality decline			0.631	
17. Crime rate increase			0.645	
<b>Overall impact factor</b>				
20. Satisfied with the status quo				0.481
19. Individuals earned interest from island tourism				0.498
21. In general the development of island tourism brings more advantages than disadvantages				0.794

Table 4. Residents social perception factors mean inspection of different industries

	Levene variance homogeneous detection		$T$ inspection for mean value	
	$F$	Sig.	$T$	Sig. (2-tailed)
Homogeneous variance	1.164	0.282	-5.827	0.000
Variance of inhomogeneous			-5.848	0.000



### Industry perception differences

In Fig. 6, we can see that there is a difference between tourism industry and other industries. To facilitate the research, residents engaged in the tourism industry or closely associated with tourism are collectively referred to as tourism residents and the others are referred to as non-tourism residents. Through the contrast we can see that there is no difference in the aspect of demographic factors. But on the positive impact perception, tourism residents are very sharp. They have higher awareness that with the increase of recreation facilities, their leisure opportunities will increase.

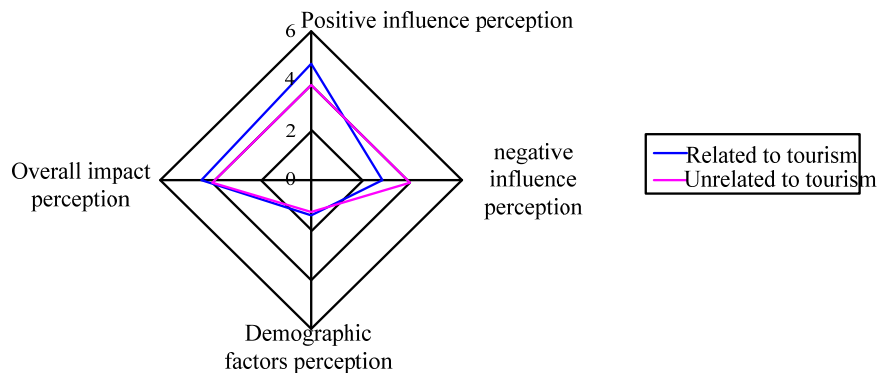


Fig. 6 Industry perception difference comparison

While the non-tourism residents have a strong reaction on negative influence perception [1], the survey found that they have a strong perception for negative social culture. In the interview it is also learned that the residents of tourism in Hainan island bay expressed deep concern over the destruction of the natural environment while non-tourism residents do not have such strong perception.

### Cultural quality perception differences

The island residents with different cultural degree show certain differences on the tourism impact perception. The attention of residents with higher literacy (above high school) is focused on “Tourism can promote the development of local economy as well as local cultural relics protection”. And residents of bachelor or above degree pay more attention to “Tourism can destroy relationships and cultivate local bad atmosphere in society”. Residents with higher literacy have high perception towards all kinds of pollution caused by tourism and its damage to the environment.

We can conclude from the Fig. 7 that on the negative perception, people with above college cultural quality have higher perception than others while obvious perception difference is not found on the overall impact perception. However, people with below primary school cultural quality have strong perception on overall perception, which may be due to the large proportion of children among the interviewers who are curious and sensitive [15].

### Age perception differences

Although the survey age distribution is more balanced, by demographic analysis it can be obtained that residents of different age stages show different perception for environmental system, especially for tourism economic impact perception. In addition, impact on the local culture and economy is also very prominent. But there are still small differences in some ways, for example, older people show strong perception on culture negative impact such as rising crime, unhealthy practices growth, deterioration of interpersonal relationship, etc. [14].

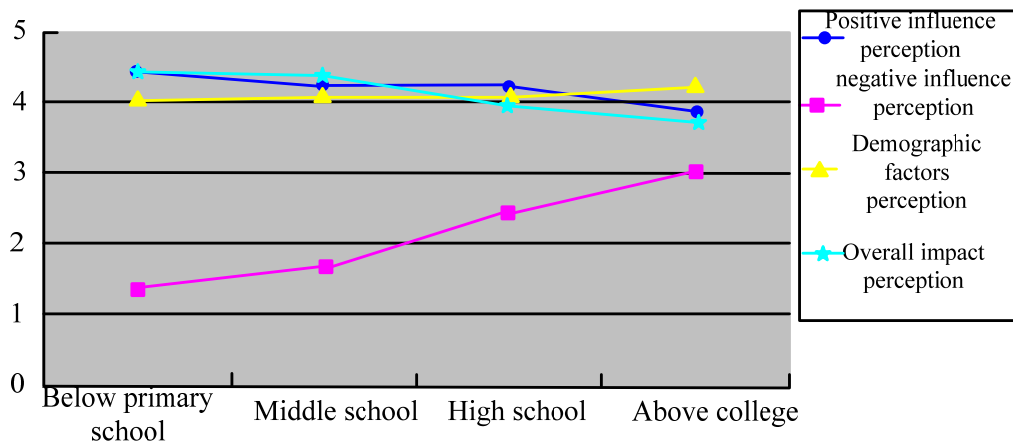


Fig. 7 Cultural quality differences

For younger people, they actually do not have perception on popularity improvement and local culture promotion. As well, residents below the age of 18 agree that tourism can popularize mandarin, indicating a keen desire of the residents of the age to learn a language. At the same time, young residents think that increasing of the tourists leaves them with fewer opportunities to use the recreation facility take the beach for instance. It means that teenagers have strong recreational needs so that there is existence of competition on the use of facilities with the tourists.

## Conclusion

It can be obtained from the above data that:

- First, as a whole, the residents show stronger positive perception than negative perception of tourism. From the influence of tourism on the economy, local culture and environment, residents have stronger positive influence perception, which also reflects that the development of Hainan island is still in the growth stage and residents have higher expectations for tourism.
- Second, by comparing the data, we can see that residents' perception to tourism economy is stronger than the perception to local culture and environment. In the survey, residents care point is mainly on change of economic income, price and land price brought by tourism. However, they show little perception to growth of the bad atmosphere in society and beach and sea water pollution.
- Third, population distribution of island residents still has subtle influence on the tourism perception. For example, in the survey, young people will pay more attention to the condition of the leisure and entertainment facilities while residents of high cultural quality would mostly focus on the negative impact of tourism on the local cultural environment. For those who rely on the tourism related industries for the family income, they have a keen sensibility to the environmental problems of tourism industry. However, they have poor sensitivity to the social bad cultural impact of tourism.

This paper mainly focused on the situation of Hainan Island which is a tourism island, and made an empirical study on environmental system perception of the local residents. Therefore, the conclusion it draws is still at the initial stage of tourism development stage theory. For empirical study of more mature stage, it remains to be studied and explored.

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