A Study on Challenges and Countermeasures Brought by the Migration of Migrant Population to Public Transport Services in Hainan Province: Based on Grounded Theory

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Abstract. The geographical environment of Hainan Province is so superior that a lot of migrant population immigrates in winter. The urban development of Hainan Province is relatively lagging, and the level of public transportation development is low, which is difficult to adapt to new needs. In this paper, using the qualitative research method of grounded theory, through the open coding, spindle coding and selective coding of interview data, the five core categories are obtained: the seasonal imbalance between supply and demand, government policy and management, the anomie behaviors of migrant population, the provision ways of public transport services and the social integration of migrant population. And then the main lines of the five core categories are given, the relationship among them is also deeply analyzed. In addition, this paper constructs a theoretical model and proposes from four aspects to deal with the challenges.

1. Introduction

With the continuous improvement of the living standard of the inland elderly, more and more old people are beginning to seek a better living environment. Hainan Province has pleasant climate and beautiful scenery. With its unique natural conditions, it has become the first choice for this huge group. Therefore, the “tidal population” who stays in Hainan Province from October to April of the following year has formed, also known as the migrant population. The migration of migrant population has caused tremendous pressure on the original public service, especially in the field of public transportation. So how to deal with the challenges brought by the migration of migrant population to Hainan's public transport services, improve the level of public transport services and promote the development of urban public transportation has become an urgent issue for Hainan Province.

Many scholars in China have done a lot of research on the development of public transportation. Wenyang Liu and Hongchang Li (2005) pointed out the important reference significance of urban public transport legislation to the development of urban public transport in China[1]; Jixiu Hao (2009) pointed out that urban public transport financial subsidy was the key link to implement the priority development of public transportation[2]; Dandan Lu conducted an analysis of the fairness of urban traffic, and analyzed the influencing factors and judgment criteria of urban road traffic fairness[3]; Jifu
Guo (2007) believed that the urban road network system was an organically coordinated system and must have a reasonable functional hierarchy and layout[4]. In recent years, with the development of information technology, the research on the development of public transportation has become more and more inclined to the direction of traffic informatization and intelligence. In general, the development of public transportation involves many factors and multi-party subjects, while domestic research on the development of public transportation mostly focuses on one aspect, comprehensive and systematic research on the development of public transportation is less. The development of public transportation in each city is not the same and the domestic research on different characteristics of different regions is less. Hainan Province has a superior geographical environment, migrant population has moved into Hainan Province, urban development has lagged, and public transport development has started late. Therefore, in view of the characteristics of Hainan Province, it is the focus of this paper to conduct a relatively systematic and comprehensive study on the challenges and countermeasures brought by the migration of migrant population.

2. Research method and data source

This paper uses the research method of Grounded Theory[5]. The grounded theory is a qualitative research method developed by Barney Glaser of the University of Chicago and Anselm Strauss of Columbia University. Its main purpose is to establish theory based on empirical data. The grounded theory compromises extreme empiricism and complete relativism, and proposes a systematic set of data collection methods to help theoretical construction[6]. The research process includes: theoretical sampling, data collection and collation, coding, formation theory, theoretical saturation test, conclusion and suggestions. Among them, coding is the most important stage, it is mainly divided into three parts: open coding, spindle coding and selective coding. These three links are gradually deepening process, and each subsequent link is carried out on the basis of the previous link.

This paper selected interviewees by the theoretical sampling method. Considering the concentrated distribution of migrant population and the level of public transportation development, Haikou, Sanya, Dongfang and Wenchang were selected as research sites. From the level of public transportation managers, we chose Hainan Provincial Department of Transportation, Dongfang City Transportation Bureau, Sanya City Transportation Bureau, Wenchang City Transportation Bureau, Traffic Police Detachment of Sanya City Public Security Bureau etc. as interviewing departments. From the perspective of public transportation service providers, in view of the fact that public transportation vehicles in Hainan Province was mainly bus, Haikou City Bus Group, Sanya City Bus Group and Dongfang Guangxiang Transportation Limited Liability Company were selected as the main subjects of the interview, so the coverage from macro to micro, from government departments to corporate entities was achieved. The sample selection is scientific and representative. In the interview process, the research team followed the principle of subjective expression of the respondents and did not set the answer range of the question so as to ensure the validity and scientific of the answer. The required material was collected in the form of recording and notes and finally organized into nearly 80,000 words of text material.

3. Category refinement and model construction

In this paper, the collected text material is analyzed according to the general operational process of grounded theory coding (open coding - spindle coding - selective coding).

3.1 Open coding

Open coding is the process of breaking up original data, assigning concepts and recombing them in new ways. The procedure includes labeling (defining phenomena) or preliminary conceptualization, conceptualization and categorization. After open coding, 36 initial concepts and 16 categories are finally obtained. The open coding process is shown in Table 1.

| Conceptualization | Categorization |
|-------------------|----------------|
|                   |                |

Table 1. Open coding process
1. Lack of bus lanes; Scarce road resources; Road network planning
   Road planning
2. Low operational efficiency
   Inefficient operation
3. Shortage of parking space; Insufficient space at the first and last stations; Lack of charging equipment
   Terminal yard construction
4. Seasonal immigration
   Population flowing features
5. Obviously seasonal demand change
   Seasonal imbalance between supply and demand
6. Citizens' choice of travel modes; Public travel habits
   Preferences of local citizens’ travel modes
7. Local demand is not obvious
   Insufficiently local demand
8. Insufficient financial fund; Insufficient land for the terminal yard
   Policy Support
9. Multiple management subjects; Examination index; Permission settings for county-level cities and prefecture-level cities; Unreasonable route planning
   Management method and level
10. Long-term loss; Corporate losses are paid by the government; Business enthusiasm is not high; Conflicts between private interests of enterprises and public interests of society; Local financial subsidy is not timely
    Development bottleneck in existing mode
11. Government purchase of public transport services
    Government purchase of public service mechanism
12. Unreasonable requirements; Covet small profits; Moral abduction; Poor law-abiding; Poor rule awareness
    The anomie behaviors of migrant population
13. Go out during peak hours
    Go out during peak hours
14. Abide by rules and regulations; Travel by local certificates; Do as the Romans do; Mutual understanding
    The social integration of migrant population
15. Occupy public traffic resources
    Occupy public traffic resources
16. Harm the safety of public transportation
    Harm the safety of public transportation

3.2 Spindle coding
Spindle coding is based on open coding to clarify the concepts and their interrelationships. Through the repeated thinking and analysis of the relationship between concepts, we integrate more abstract categories. According to the canonical analysis model of grounded theory: causal conditions → phenomena → situation (thread) → intermediary conditions → interaction strategy → results, the categories obtained in open coding are linked to form an organic whole that can accurately grasp the main category. Through the spindle coding, the 36 concepts and 16 categories obtained in the open coding are analyzed, and finally five main categories are obtained. The spindle coding process is shown in Table 2.

| Causal conditions | Phenomenon | Thread | Results |
|-------------------|------------|--------|---------|
|                   |            |        |         |
Population flowing features; Preferences of local citizens' travel modes; Terminal yard construction; Road planning

Preferences of local citizens' travel modes indicate insufficiently local demand; the population flowing features make the demand for public transportation vary greatly with the seasons; infrastructure such as urban road planning and terminal yard construction directly affects the efficiency of public transport supply and operation.

The support of government policy has an important impact on the terminal yard construction; the management method and level affects the road planning, which affects the convenience of public transportation and operational efficiency.

The anomie behaviors of migrant population endanger public transportation safety to a certain extent; population flowing features and going out during peak hours occupy local public traffic resources.

The development bottleneck in the existing mode promotes the application of the government purchase of public service mechanism in the field of public transportation.

The existence of the anomie behaviors of migrant population promotes the thinking of the social integration of migrant population.

3.3 Selective coding
Selective coding is based on the analysis of the spindle coding, selecting the core category, associating the core category with other categories in the form of story line and gradually improving the core categories and their relationship. Through selective coding, five core categories are obtained: the seasonal imbalance between supply and demand, government policy and management, the anomie behaviors of migrant population, the provision ways of public transport services and the social integration of migrant population. The main lines of each core category are as follows:

The main line of the core category of the seasonal imbalance between supply and demand: the demand for public transport services of local residents is not obvious, so the driving force of public transport services is insufficient. Besides, the infrastructure (ancillary facility) such as road planning and terminal yard construction is backward and the efficiency of public transportation is inefficient. Therefore, the supply of local public transport services is only maintained at the level that meets the needs of local people. But the seasonal migration of migrant population causes seasonal increase in the demand for public transport services, so original supply level is difficult to meet the needs, posing a challenge to Hainan's public transport services.

The main line of the core category of government policy and management: government policy and
management affects the supply of public transport services. Terminal yard construction and road planning require the government to provide land security and financial support; the government's management level and method affect the road planning level. The current situation that the supply of public transport services cannot meet the huge demand brought by the migration of migrant population is also a challenge to the government's policy and management level.

The main line of the core category of the anomie behaviors of migrant population: the unreasonable requirements of some migrant population, the lack of legal and regulatory awareness and the seasonal migration etc. pose a challenge to public transportation safety and resource allocation.

The main line of the core category of the provision ways of public transport services: the development bottleneck in the existing mode of public transport services prompts the reflection and change of the way public transport services are provided. The application of government purchase of public service mechanism in the field of public transport services is recognized and promoted.

The main line of the core category of the social integration of migrant population: it is necessary to help migrant population comply with traffic regulations and code of conduct, follow the customs and strive for their understanding and support so as to promote the social integration of migrant population and create a good social atmosphere.

4. Theoretical saturation test
The four randomized interview records reserved in advance are subjected to the theory analysis of the same process and theoretical saturation test to determine whether to stop sampling. The results show that there are no new categories and relationships outside the model and the research achieves theoretical saturation.

5. Conclusion and Suggestions
Based on the research method of grounded theory, this paper studies the challenges and countermeasures brought by the migration of migrant population to public transportation services in Hainan Province. Through the open coding - spindle coding - selective coding, we get five core categories: the seasonal imbalance between supply and demand, government policy and management, the anomie behaviors of migrant population, the provision ways of public transport services and the social integration of migrant population; and we explain the main line of the core categories. Among them, the three core categories of the seasonal imbalance between supply and demand, government policy and management, the anomie behaviors of migrant population are the challenges; the provision ways of public transport services and the social integration of migrant population are the countermeasures. Based on grounded theory research, suggestions on the challenges brought by the migration of migrant population to public transportation services in Hainan Province are proposed from four aspects. The theoretical model is shown in Figure 1.
5.1 **Overcome the seasonal imbalance between supply and demand**
On the supply side, the government must improve the road infrastructure, expand the roads, set up special channels for bus and provide sufficient land security for the terminal yard construction. On the demand side, the government should actively encourage local citizens to travel by public transportation, boost supply through demand growth and promote the rapid development of public transportation. It is necessary to explore and improve the dynamic adjustment mechanism of public transport services so as to ease the seasonal imbalance between supply and demand.

5.2 **Transform the provision ways of public transport services**
According to the new public management theory, the government should widely adopt the successful management method and experience of the private sector, also should adopt the corresponding supply method according to the content and nature of the service. Therefore, it is necessary to actively reflect and transform the provision ways of public transport services such as actively promote the implementation of government purchase of public transport service mechanism.

5.3 **Promote the social integration of migrant population**
Using Durkheim's theory of social solidarity, the migration of migrant population to Hainan is aimed at holiday tourism. Most of them belong to the consumer group and are not included in the local social division of labor system. Therefore, on the one hand, we must make use of migrant population talents to integrate them into the local social division of labor system; on the other hand, we should guide them to abide by regulations and code of conduct, understand each other and follow the customs.

5.4 **Improve the level of government policy formulation and management**
On the macro level, the transformation of provision ways of public transport services and the promotion of social integration of migrant population require government’s promotion; specifically, the government should increase financial support in the field of public transport and improve the management level of transportation management department so as to promote the rational planning of road network and improve the efficiency of public transportation operation.
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