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Investigating Multidimensional Factors Influencing Switching Intention on School Bus among Chinese Parents—A Push–Pull–Mooring Framework

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Abstract: School buses could alleviate the emissions associated with school travel. China is devoted to promoting its school bus service, leaving parents in a dynamic process of change from the original school travel mode to using the school bus service. This study analyzes parents' switching intentions regarding school buses and decomposes the dimensions of certain critical factors by applying the Push–Pull–Mooring model. We conducted an online questionnaire survey of 463 parents. The measurement model result showed a satisfying prediction power, superior to that of existing theories. The results showed that perceived service quality is the most influential factor in the initial stage of school bus promotion. Among the four dimensions of perceived service quality, parents emphasize reliability and comfort. These results contribute to a deeper comprehension of parents' intentions to switch to school bus services during the rollout phase and to ensuring sustainable school travel.

Keywords: switching intention; school bus; Push–Pull–Mooring framework; perceived service quality; perceived risk

1. Introduction

School travel refers to travel by primary and secondary school students to and from school [1]. Picking up children in person has become a common choice for most parents due to safety concerns. More than 50% of American parents accompany their children to school [2]. In New Zealand, 57% of parents drive their children to school [3]. Escorting children is more usual in China. The social investigation center of the China Youth Daily stated that 64.7% of parents prefer to escort their child in person [4]. The strong relationship between age and escorting rate indicates that children in primary and secondary school are more likely to attend school accompanied by parents [5]. This school travel trend of escorting children has raised several problems. Firstly, since the time for travel to school usually coincides with peak traffic hours in the city, escorting children may cause severe congestion at schools, which might lead to increased emissions. According to research, an 8% reduction in the distance travelled by cars on school trips could reduce pollutant emissions by 12% [6]. Secondly, the inconsistency between working hours and school time exacerbates the impact of this escorting on regular work [6]. Grandparents are therefore asked to pick up their children. However, the older people's relatively poor health might bring potential safety hazards to children. One possible solution to the aforementioned problems might be using school buses. A school bus with 30 seats could replace nearly 20 private cars for school travel [7] and average emissions per student are smaller than private cars [8]. In addition, traveling by school bus helps children to foster independence and frees up time for parents and seniors.

School bus services are an underutilized travel mode in China [9] due to scarce government support and non-free tickets [10]. Most students travel to primary and secondary school by bike, private car, bus, or foot, and few students commute by school bus [11].

Popularization of the school bus in China is still in its infancy. Up to 2020, school bus ownership in China is 250,000 [12], corresponding to a potential demand of 505,000 [13]. A draft resolution was proposed during Two Sessions in 2021 to solve the severe problems caused by school travel and meet the urgent potential demand for school bus services. The draft resolution presents an extension approach to school bus usage at the national level. However, the popularization of any one travel mode needs to understand travelers' perceptions and the determinants of usage intention [14]. Different from adult travel, although the participants in school travel are students, the decision-makers are parents [15]. Parents without school bus experience have to decide whether to abandon the habitual travel mode, such as walking, cycling, and driving. Therefore, understanding parents' switching intentions in escorting children is essential for the promotion of a school bus service.

Previous research has been devoted to exploring the determinants of parents' decisions regarding their children's school travel mode choice [16–20], providing robust support on usage intention in school travel studies. Researchers have classified two streams of intention, continuous intention and switching intention [21]. Continuous intention refers to an individual's behavioral tendency towards using a former product or service [22]. Switching intention describes the preference to exchange or replace a current travel mode with another mode [23]. The mechanism behind continuous intention and switching intention contains heterogeneity [22]. Understanding the influencing factors on switching intention provides essential support for policymakers and transportation operators in popularizing an emerging travel mode [24–26]. Most previous literature on school travel has focused on travel mode choice and continuous intention. The research on the switching intention towards using school buses to escort children is limited. One possible reason is that the relative research is conducted in developed countries, such as Australia and the USA. The school bus service in these countries can be traced back to the early 20th century [27], maintaining a stable school bus occupancy. Switching behavior from other school travel modes to the school bus has been ignored in previous studies. However, via school bus promotion, Chinese parents may make the switching behavior necessary to escort children via the school bus service. Therefore, this research analyzes the switching intention of parents of primary and secondary school students, exploring which factors may influence their switching intention to use the school bus service.

The push–pull–mooring (PPM) model is introduced in this research to analyze parents' switching intentions regarding the school bus service. The PPM framework initially explains migration behavior [28], which contains three influencing factors: push, pull, and mooring factors. The push and pull factors reflect the positive incentives to facilitate the switching intention. Inversely, the mooring factor represents the negative barrier to switching intentions. The PPM model has been widely applied to reveal the switching intention of consumers [22,27,29]. Furthermore, Wang et al. [26] confirm the feasibility of explaining the switching behavior to green transport through the PPM model. Therefore, this research explores individuals' switching intentions, i.e., to replace the original travel mode in order to escort children via the school bus service, by applying the PPM model.

During the decision regarding school travel mode, parents always balance positive and negative factors, which have been widely examined in active school travel studies. Parents might trade off safety risks against physical health benefits [3] to decide whether send their children to school via an active travel mode. However, the trade-off relationship concerning school bus travel requires exploration. Convenience and comfort are the key attractions for travel mode selection [15,20]. For public transport, convenience, comfort, and reliability could be aggregated as perceived service quality, positively affecting usage intention [30]. Therefore, parents' positive perception of school bus service quality might become a crucial promoting issue in encouraging their intention to send children by school bus. Conversely, parents' perceived risk also impacts their travel mode decision [31]. While taking the school bus, children might face the risk of bullying behavior and injury in a traffic accident. Moreover, traveling by public transport may provide a sealed space, which may raise the infection risk for children [32]. Especially with the outbreak of COVID-19, parents'

health concerns may increase the risk perception. However, whether parents would accept the service quality and switch to using the school bus or be concerned about the risk and reject using it remains an open question, which previous research has found it hard to answer. Therefore, this research takes perceived service quality as a critical push factor, takes perceived risk as the main mooring factor, and trades off the relationship between these factors. Moreover, this research also analyzes the impact of perceived value, inertia, and government credibility on parents' switching intentions toward school bus usage.

This research attempts to answer the following questions: combined with the popularization of the school bus service, how can we analyze parents' switching intentions? Is the PPM model suitable for exploring parents' switching intentions? Which factors influence parents' switching intention? Regarding COVID-19, are perceived service quality and perceived risk the main impact factors, and what is the trade-off relationship between these two factors? What policies could effectively enhance the sustainability of school travel for students in China?

The remainder of this paper is structured as follows. After the introduction, Section 2 provides the rationale for the hypothesis development. Section 3 outlines the research methods and is followed by a description of the tests used for data analysis. Section 4 shows the results of three mathematical models. In Section 5, the research findings, and theoretical and practical contributions are discussed. Finally, the research conclusions, limitations and potential opportunities for future studies are put forward in Section 6.

2. Research Background

As a unique public transportation mode for school travel [33], studies on school buses have aroused scholars' focus. Existing studies were mainly conducted in developed countries with established school bus systems [34,35]. However, the school bus system has a different development status in China compared to developed countries. The review begins with a comparison of school bus development status in different areas, and then the research model and hypotheses applied to the school bus service in China are raised.

2.1. Comparison of School Bus Development Status

The United States Congress has passed School Bus Safety Amendments since 1974 and identified requirements for licensure, training and school bus manufacturing, providing a high level of safety for students [36]. The establishment of specific regulations for school bus services in China was not enacted until 2012 [37]. Although many districts are actively improving local school bus measures, loopholes in school bus regulations (such as pricing and strict safety supervision) have caused a low share rate for school buses [10]. Figure 1 shows illegal school bus services in Rural China. The above barriers to the Chinese school bus service suggest a requirement to understand its unique school bus service.

Figure 1. Illegal school bus services in Rural China.

2.2. Research Model and Hypotheses

Figure 2 shows the variable relationships of the research model in this study. The research model is developed based on the PPM framework, which categorizes the independent variables into push, pull, and mooring effects. The dependent variable is the parental switching intention to use the school bus service.
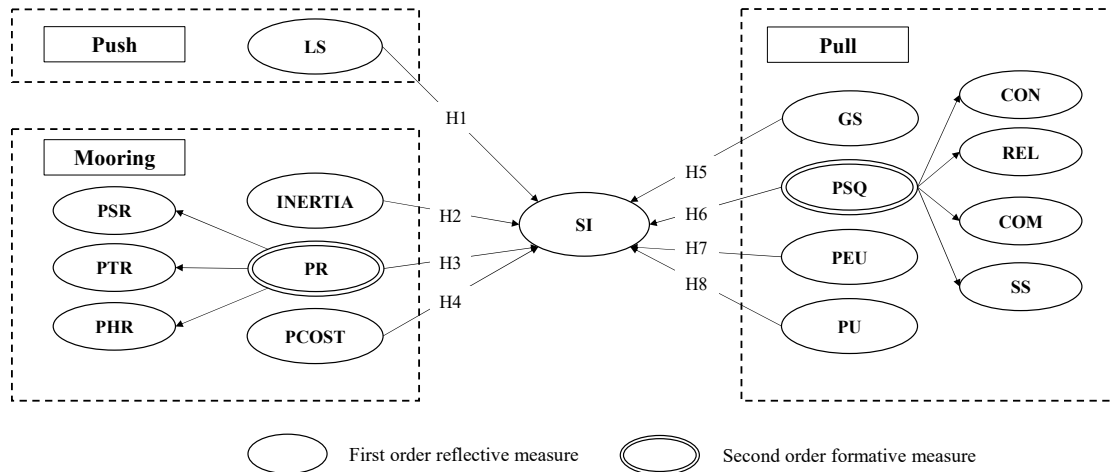

Figure 2. The proposed conceptual model.

2.2.1. Push Effect

The push effect is described as an attribute that encourages people to leave an original behavior behind [38]. Push factors generally include service elements, such as service quality and learning convenience [39] and affective responses such as low satisfaction and low trust [23], etc. We defined push factors as most Chinese parents' perceptions of the shortcomings in the way they are currently used to travel, motivating them to switch toward using school buses. This study mainly reports low satisfaction when regarding these push factors.

Low satisfaction. Satisfaction is a key factor affecting people's subjective choices [40]. Satisfaction signifies a degree often used to express the perception of the quality of products or services. Therefore, it is considered that there is a causal relationship between satisfaction and switching intention. High satisfaction motivates people to choose the better service among multiple banks [41]. However, consumers with low satisfaction will show a stronger willingness to switch than consumers with high satisfaction [42]. Low satisfaction is generally considered to be a negative push factor that affects people's willingness to switch [23]. Furthermore, low satisfaction also affects people's choice of travel mode [43]. In previous studies, time from home to station and safety issues [44] on school buses can cause people to experience low satisfaction, which affects people's choice of the school bus as a means of transportation for their children. In this study, we defined low satisfaction as the level of parental dissatisfaction with the current mode of transport used. This study explores whether a low level of satisfaction influences people's switching intention toward school bus usage. The hypothesis is proposed as follows:

H1: *Low satisfaction (LS) positively affects parental switching intention towards school buses.*

2.2.2. Mooring Effect

The mooring effect refers to life-course, cultural and spatial issues that hamper the migration decision [38]. While push–pull effects are often caused by the external environment, mooring factors act as moderators that can enhance or weaken individuals' intention to act [26]. The mooring factor in this study refers to the negative impact that reduces the Chinese parents' switching intention. Inertia, perceived risk and perceived cost were

considered mooring factors hindering the switching intention towards using school buses to escort children.

Inertia. Inertia was defined at the individual level as attachment and persistence to existing behavior patterns or the status quo, even when there are better options or motivations to change [45]. High-inertia users had low levels of motivation to switch from existing consumption patterns to new ones [28]. Therefore, it is necessary to consider inertia as a sub-construction of the mooring effect to explore its influence on switching intention. Polites and Karahanna [45] confirmed that inertia led to lower perceptions of the ease of use and comparative advantage of newly introduced systems and negatively affected the intention of new systems' usage. Dogra et al. [46] blended inertia with the PPM framework to better explicate patients' switching intention towards e-health consultation platforms. That inertia significantly influenced patients' switching intentions from visiting hospitals or clinics to e-health consultations has been proved. Inertia in this study focused on the switching intention concerning people's travel mode when escorting their children to commute. People have already adapted to their present travel mode for escorting their children, which might be a hindrance to switching to school bus usage. We propose the following hypothesis:

H2: *Inertia negatively affects parental switching intention towards school buses.*

Perceived risk. Perceived risk refers to "the nature and amount of risk perceived by a consumer in contemplating a particular purchase decision" [47]. Perceived risk is regarded as an essential negative factor influencing travel mode choice behavior [30]. In the context of school travel, parents' risk perception comes from different sources, such as crash risk and functional risk [48]. Donnellan et al. [3] illustrated that risk perception conferring personal safety aroused attention from children, parents, and school representatives in choosing children's travel mode to school. Parents demonstrated their fear of strangers snatching their children and told their children to stick to the main roads. Carver et al. [49] reported that road safety could cause parental risk perception and lead to restrictions for their children. Beck and Nguyen [34] emphasized the need for bullying prevention efforts to target school buses to make children's commutes a safe and enjoyable experience, which would effectively influence risk perception regarding school buses. This study defines perceived security risk as parental concerns about the possible harm to their children's security caused by a school bus service. Perceived traffic risk refers to the risk of road traffic injuries to children caused by risky driving behavior and inappropriate vehicle safety features. Both perceived security risk and traffic risk are dimensions of parental perceived risk.

Air conditions inside school buses seem to be another concern for parents. School buses provide enclosed spaces, which can increase the possibility of infection [50]. Neira-Munoz et al. [51] revealed a high level of transmission among contacts of an infectious bus driver. A new pandemic disease, COVID-19, occurred in 2020, sparking a new wave of fears about infectious diseases [52]. Parents might be concerned about whether their children are at risk of contracting COVID-19 [53,54], especially when using the school bus service. Therefore, this research defines the parental perception of their children's infection probability during a pandemic as a perceived health risk, another dimension of parental perceived risk.

Passengers' perceived risk has a significant impact on their travel behavior and mode choice. For example, in the promotion process for public bicycles, users' perception of risk affects their usage possibility regarding public bicycles as a usable mode of transportation, and the possibility of using public bicycles may decrease along with the increase of users' perception of risk [55]. Parental risk perception influences their decision on children's school travel mode choice. Scheiner et al. [56] proposed that parents' perceived risk was the key factor in hindering children's active travel. Lee [57] also illustrated that parents were more inclined to drive their children to school due to risk concern. In this research, perceived risk is defined as parents' evaluation of risk when their children use the school

bus. School bus-related traffic accidents, bullying, and other vicious incidents have occurred in China [58], making parents' risk concerns prevent them from choosing school buses. We raise the following hypothesis:

H3: *Perceived risk (PR) negatively affects parental switching intention towards school buses.*

Perceived Cost. Perceived cost (PCOST) refers to the cost incurred in adopting new technology [59]. Studies have shown that perceived cost was usually seen as a barrier to system or technology adoption [60]. Previous PPM studies often used perceived costs to explore the switching behavior of individuals [61]. Individuals might be inclined to make optimal decisions based on considering the cost of switching behaviors. At the same time, the cost factor affects the choice of individual travel modes [62]. In this study, people may be hampered by the expenses incurred in using the school bus regarding their decision to switch to school bus usage. In China, there are no clear regulations on the charging standards on school buses for escorting pupils [63]. However, in some areas where school buses are implemented, the charging standard for school buses is 350 yuan per student per semester for full-time students within 4 km and 400 to 800 yuan for more than 4 km [64]. For some Chinese parents, the perceived cost of using school buses has a negative impact. We defined perceived cost as a parent's perception of the monetary cost of switching to school bus usage for their children's commute, and regard perceived cost as the mooring effect's subconstruct. To sum up, the following hypothesis was introduced:

H4: *Perceived cost (PCOST) negatively affects parental switching intention towards school buses.*

2.2.3. Pull Effect

Pull factors are described as the positive attributes that attract people to migrate to a destination [38]. Wang et al. [26] referred to pull factors as positive attractors, motivating individuals to choose green transportation for commuting. This study defined pull factors as the benefits of switching to school bus usage. Government support, perceived service quality, perceived ease of use, and perceived usefulness were the main concerns of this study.

Government Support. Government support (GS) means that the government exercises administrative functions to intervene in order to achieve the purpose of arriving at a target [65]. Previous studies have shown that government support has a positive effect on people's choice behavior. Government support, as a moderator, was used to explore factors affecting the adoption intention of electric vehicles in India [66]. Cao et al. [67] confirmed the positive influence of incentive policies on individual peddlers' intention to switch to street vending. Government policies and campaigns were regarded as the subconstruct of the pull effect, in order to explore the shift to green transportation in previous research [26]. However, few studies have introduced government support into the framework of PPM to explore school bus usage switching intention [68].

Although China promulgated the *School Bus Safety Management Regulations* in 2012, the popularity of school buses is not high enough in China. Whether or not measures from the government, such as increased capital investment or promoted propaganda, may play a pulling effect in parents choosing school bus travel for their children, has no definite conclusion. Hence, the hypothesis is proposed as follows:

H5: *Government support (GS) positively affects parental switching intention towards school buses.*

Perceived service quality. Perceived service quality refers to the individual's overall judgment of a service, which could directly affect behavior intention [15,23]. Perceived service quality is a key influencing factor on people's travel behavior. Especially for public transport decisions, good service quality could positively impact people's intentions and behavior [30]. Eboli and Mazzulla [69] developed a service quality index to highlight the importance of service quality attributes on college students' selection of public transport. Ratanavaraha et al. [70] also illustrated that information related to the bus service quality parameters could provide insight into how to build customers' usage intention regarding

bus services. The school bus service is a public school travel mode for primary and secondary school students, which could be significantly influenced by service quality [71].

Díez-Mesa et al. [72] found that the total perceived service quality could be affected by several dimensions. However, Lai and Chen [73] illustrated that the dimensions of perceived service quality needed appropriate adjustment to reflect the specific characteristics of the service context. In other words, the dimensions of perceived service quality maintain dissimilitude among different research purposes. Chang et al. [29] attempted to reveal how perceived service quality would influence consumers' switching behavior in multichannel shopping. Four dimensions of perceived service quality in shopping channels were physical aspect, reliability, personal interaction and problem-solving. In bus service studies, Nguyen-Phuoc et al. [30] proposed four dimensions of perceived service quality in public transport: tangibility, convenience, personnel and reliability. To analyze students' behavior intention in choosing customized travel modes, Hao et al. [15] divided the service quality of customized student routes into three dimensions: basic service quality, personalized service quality, and transportation routines service quality. Therefore, dimensions of perceived service quality for school buses need targeted selection.

Comfort is a common factor in measuring the service quality of public transport. Khan et al. [74] emphasized that parents' perceptions of school bus service were positively sensitive to comfort. Agyeman and Cheng [71] found that buses with spacious, neat and available seats would increase customers' satisfaction. The school bus service is required to provide one seat for each child [37], ensuring seat availability. The comfort attribute, including spaciousness and cleanliness, still effectively influences parents' perception of school bus services. Studies have been devoted to solving routing problems to enhance the service quality of school buses [75]. Providing proper school bus routing and schedules could promote the reliability of school bus services [76]. Therefore, reliability seems to be an essential factor in school bus service quality. Distance between travel origination and the bus stop significantly influences individuals' perceptions of public transport [77], a critical dimension in evaluating public transport service quality [78]. Similarly, children need to walk to the school bus station from home [19], and previous studies proved that parents emphasize the convenience of a school bus service [33]. Research demands are to quantitatively evaluate the relationship between the influence of convenience and parents' perceptions.

This research attempt to take the convenience of the school bus service as another dimension of perceived service quality to quantify the impact. Staffing service reflects the user experience of the school bus. Parents may worry whether their children will arrive at school safely and punctually [71]. Arranging teachers to take care of their children and sending a message to tell parents about their children's location could increase parents' favorable impression of school bus services. In walking school bus research, Ermagun and Samimi [79] verified that arranging for parents to escort children could improve parents' acceptance. Therefore, this research separates parents' perceived service quality into four dimensions: comfort, reliability, convenience, and staff service.

Previous studies illustrated that good service quality has a positive impact on passengers' travel behavior and their willingness to continue using public transport in the future [71]. Hao et al. [15] demonstrated a positive relationship between parents' perceived service quality and willingness to use customized buses. In America, the school bus rate continued to decline from 1969 to 2017 due to poor service [20]. Therefore, parental perception of school bus service quality may significantly affect their acceptance of school buses, and the higher their perception of service quality, the more likely they are to change their willingness to use school buses. The hypothesis is proposed as follows:

H6: *Perceived service quality (PSQ) positively affects parental switching intention towards school buses.*

Perceived Ease of Use. Perceived ease of use (PEU) refers to the degree to which users think that processes are easy to use and free of effort when using technology or a particular

system [80]. Perceived ease of use and perceived usefulness are the two main factors of TAM [81]. Some previous studies showed that perceived ease of use has an important impact on usage intention [82,83]. In previous PPM literature, perceived ease of use was regarded as one of the most critical pull factors that promote switching intention. Tang et al. [84] integrated perceived ease of use into the PPM framework to determine influencing factors on consumers' channel migration intention when choosing mobile shopping. To sum up, this study introduced perceived ease of use as one of the pull factors that positively affect switching intention regarding school bus usage.

H7: *Perceived ease of use (PEU) positively affects parental switching intention on school buses.*

Perceived Usefulness. Studies showed that perceived usefulness (PU) is a primary determinant in the study of an individual's switching intention [85]. Perceived usefulness was defined as the degree to which a person can improve his efficiency by using a specific system [80]. Wang et al. [55] indicated that perceived usefulness had a positive impact on consumers' intention to use ride-sharing services when people choose to travel. Therefore, this study supposed that perceived usefulness may promote decision-making about school bus usage when people realize that school buses are more useful than expected. Perceived usefulness is often introduced into the PPM framework as a pull factor to explore people's switching intentions [86,87]. Perceived usefulness is incorporated into our research to explore people's intentions toward school bus usage.

H8: *Perceived usefulness (PU) positively affects parental switching intention towards school buses.*

3. Survey Design

We designed a cross-sectional questionnaire to explore parental perceptions of switching to the school bus service. The questionnaire comprised two main parts. The first part included the demographic information on parents and their children (e.g., child gender, age, parent gender, car ownership). The second section collected information on parental switching intention towards school buses and on their psychological perception of school bus services. An overview of the deployed measures is provided in Appendix A.

An online survey approach was used to obtain cross-sectional data in this study. To ensure the quality of the data and evaluate the validity and clarity of the questionnaire, two rounds of pre-test were conducted before the formal investigation. The initial survey invited 11 respondents who were not involved in the questionnaire design to participate and made minor changes to the questionnaire as suggested. Snowball sampling was applied to collect data in the second phase of pre-investigation. The feedback from 65 scholars and commuters at the university greatly improved the quality of the questionnaire. Next, the modified questionnaire was used for the official survey via SoJump (www.sojump.com) in a timely and cost-effective manner.

A survey was conducted from 13 September 2021 to 13 October 2021, and several questionnaires were distributed to different cities in China. A total of 993 questionnaires were distributed, 639 questionnaires were returned, and the recovery rate was 64.35%. The dependent variable of this study is parents' switching to school bus usage. 499 samples were retained after screening and retaining respondents who had never used the school bus. Thirty-two responses were discarded due to significant problems, such as repeated IP addresses, logical errors, inconsistent answers, etc. Finally, investigators obtained 463 valid questionnaires for subsequent data analysis. Figure 3 shows a flow chart of the data sampling and processing.
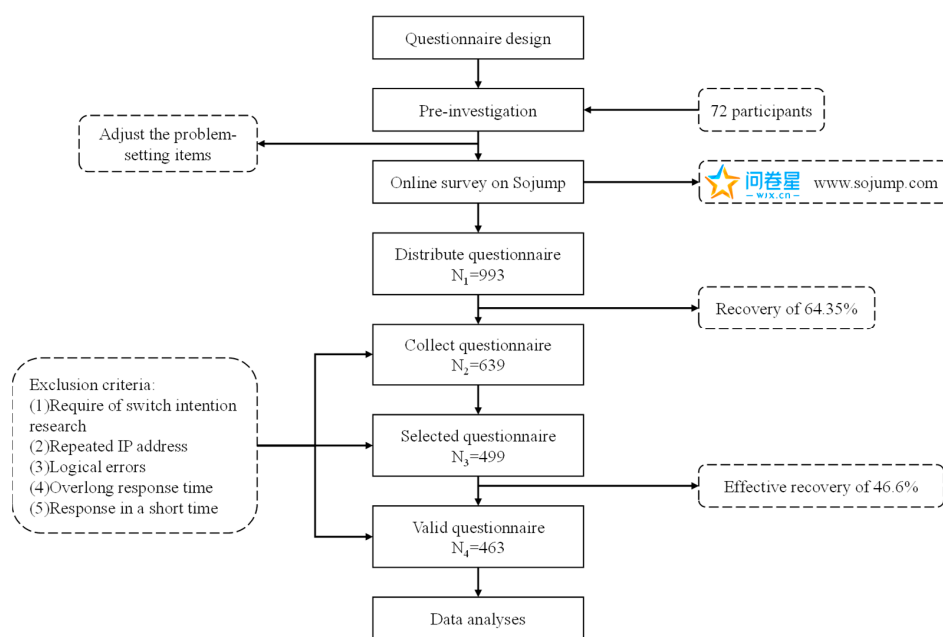
Figure 3. Flow chart of data collecting and processing. The Chinese text in the picture illustrates the questionnaire platform.

The demographic characteristics of the samples are summarized in Table 1. As shown in the chart, the sample contains parents of 252 boys and 211 girls. The proportion of males and females included in the survey is approximately evenly distributed. Among the respondents, less than one-tenth of the households in the sample did not have a car. About 93.3% of children live in homes with more than one car and 41.3% of the respondents report their annual income (CNY) to be 150,000–250,000. More than half of the parents believe that school bus pick-up times are unreasonable. In escorting children to commute, more than half of the parents choose to pick up and drop off their children more often than letting their children take the bus by themselves.

Table 1. Descriptive statistics of participant characteristics.

Demographic Variables	Description	Sample Size	Percentage
Children gender	Male	252	54.4%
	Female	211	45.6%
Children age	5–7 years old	119	25.7%
	8–11 years old	244	52.7%
	12–15 years old	100	21.6%
Car number	0	31	6.7%
	≥1	432	93.3%
Annual income (CNY)	<150,000	134	28.9%
	150,000–250,000	191	41.3%
	>250,000	138	29.8%
Unreasonable pick-up and drop-off times	No	213	46.0%
	Yes	250	54.0%

4. Results

This section presents the entire results of this study, including structural equation modeling and Bayesian network analysis. The results of each of the two models are presented next.

4.1. Measurement Model

In the Structure Equation Model (SEM), the reliability and validity of items should be tested before the modeling analysis. After that, the overall goodness of fit and hypothesis test could be estimated.

4.1.1. Reliability and Validity Analysis

Reliability, convergent validity and discriminant validity are used to evaluate the measurement model of this study. Credibility was measured with Cronbach's alpha value and composite reliability value [88]. As shown in Table 2, all the Cronbach's α values and CR values are higher than or equal to the 0.7 recommended by [88], indicating sufficient internal consistency and reliability. All the average variation extraction (AVE) is higher than 0.5 [88], confirming that convergent validities of all constructs are sufficient.

Table 2. Reliability and convergent validity analysis.

Potential Variable	Reliability		Convergent Validity
	Cronbach's α	CR	AVE
CON	0.73	0.731	0.573
REL	0.7	0.707	0.548
COM	0.79	0.79	0.557
SS	0.81	0.811	0.589
PSR	0.87	0.877	0.704
PTR	0.88	0.886	0.722
PHR	0.91	0.91	0.770
PCOST	0.86	0.866	0.685
PEU	0.79	0.788	0.651
LS	0.83	0.839	0.630
PU	0.76	0.774	0.535
INERTIA	0.86	0.859	0.671
GS	0.76	0.765	0.521
SI	0.92	0.925	0.754

Moreover, discriminant validity, reflecting the degree of difference between the proposed construction and other items, is tested by Pearson's correlation coefficient. The square root of AVE (as shown by the diagonal line in Table 3) is greater than the correlation coefficient, which indicates that discriminant validity is acceptable. Therefore, the reliability and validity of the measurement model are acceptable.

Table 3. Discriminant validity.

Construct	CON	REL	COM	SS	PSR	PTR	PHR	PCOST	PEU	LS	PU	INERTIA	GS	SI
CON	0.757													
REL	0.678	0.740												
COM	0.450	0.579	0.746											
SS	0.425	0.668	0.624	0.767										
PSR	−0.218	−0.208	−0.260	−0.234	0.839									
PTR	−0.166	−0.265	−0.139	−0.187	0.692	0.850								
PHR	−0.104	−0.115	−0.170	−0.095	0.593	0.681	0.877							
PCOST	−0.225	−0.139	−0.159	−0.151	0.391	0.272	0.219	0.828						
PEU	0.485	0.332	0.263	0.206	−0.159	−0.124	−0.119	−0.212	0.807					
LS	0.149	0.187	0.154	0.101	0.049	0.045	0.047	0.151	0.177	0.794				
PU	0.693	0.605	0.523	0.450	−0.230	−0.164	−0.131	−0.202	0.492	0.231	0.731			
INERTIA	−0.340	−0.224	−0.134	−0.081	0.331	0.204	0.149	0.401	−0.397	−0.249	−0.469	0.819		
GS	0.450	0.486	0.441	0.435	−0.154	−0.114	−0.142	−0.167	0.352	0.174	0.606	−0.181	0.722	
SI	0.602	0.618	0.506	0.466	−0.308	−0.257	−0.225	−0.253	0.507	0.387	0.718	−0.536	0.558	0.868

4.1.2. Structure Model and Hypothesis Tests

Confirmatory Factor Analysis (CFA) was used to test whether the relationship between latent variables and the measured variables is in line with the theoretical relationships

designed. The validity of the measurement model was assessed by model fit indices, including Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Standardized Root Mean Square Residual (SRMR).

As shown in Table 4, all fitness indexes of the measurement model seemed acceptable ($\chi2/df = 1.73$; RMSEA = 0.039; CFI = 0.954; TLI = 0.949; SRMR = 0.043). All factor-loading values of the items were acceptable. The results of the structural model showed that the model provided a very good fit to the data.

Table 4. Results of goodness of fit.

Index	$\chi2/df$	RMSEA	CFI	TLI	SRMR
Check critical value	<3	<0.08	>0.9	>0.9	<0.08
Model parameter value	1.73	0.039	0.954	0.949	0.043
Whether to accept	accept	accept	accept	accept	accept

In the following stage of hypothesis testing, this research used a *p*-value as the test criteria of hypotheses, and $p < 0.05$ indicates that the hypotheses could be accepted. The path analysis was performed to test whether the hypotheses are significant in the path model. As the results of standardized path coefficients, all hypotheses were validated, as their *p*-values were within the acceptable range, except for hypothesis 4. This indicated that perceived cost had no significant effect on the switching intention to use the school bus. H1, H2, H3, H5, H6, and H7 concerned the relationships between low satisfaction (LS), inertia (INERTIA), perceived risk (PR), government support (GS), perceived service quality (PSQ), perceived usefulness (PU), perceived ease of use (PEU) and switching intention to use the school bus (SI).

Hypothesis 1 supported that low satisfaction as the only push factor influenced switching intention positively ($\beta = 0.187$, $p < 0.001$). Hypothesis 2 was significant ($\beta = -0.233$, $p < 0.001$) and valid, which indicated that inertia negatively influenced the switching intention towards using the school bus. Hypothesis 3 was proved and validated, exhibiting a negative effect from the perceived security risk on switching intention ($\beta = -0.091$, $p < 0.05$). All factors have a significant impact on switching intention, except for the perceived cost in the mooring effect. Government support positively affected the switching intention in hypothesis 5 ($\beta = 0.123$, $p < 0.05$). In hypothesis 6, the positive influence of perceived service quality was confirmed ($\beta = 0.352$, $p < 0.001$). Finally, perceived usefulness and perceived ease of use positively impacted school bus switching usage, rendering hypotheses 7 and 8 valid ($\beta = 0.095$, $p < 0.05$). Therefore, hypotheses H1, H2, H3, H5, H6, and H7 are supported. The above analyses revealed the following results (see Table 5 and Figure 4).

Table 5. The result of path coefficients for each causal relationship.

| Hypothesis	Causal Relationship	Estimate	S.E.	*p*-Value
H1	LS→SI	0.187	0.037	0.000 ***
H2	INERTIA→SI	−0.233	0.049	0.000 ***
H3	PR→SI	−0.091	0.039	0.019 *
H4	PCOST→SI	−0.005	0.040	0.902
H5	GS→SI	0.123	0.049	0.012 *
H6	PSQ→SI	0.352	0.074	0.000 ***
H7	PU→SI	0.174	0.078	0.025 *
H8	PEU→SI	0.095	0.042	0.023 *
	PSR←PR	0.813	0.030	0.000 ***
	PTR←PR	0.865	0.028	0.000 ***
	PHR←PR	0.753	0.030	0.000 ***
Dimension estimation	CON←PSQ	0.739	0.040	0.000 ***
	REL←PSQ	0.867	0.034	0.000 ***
	COM←PSQ	0.716	0.036	0.000 ***
	SS←PSQ	0.715	0.036	0.000 ***

Note: *** $p < 0.001$ * $p < 0.05$.
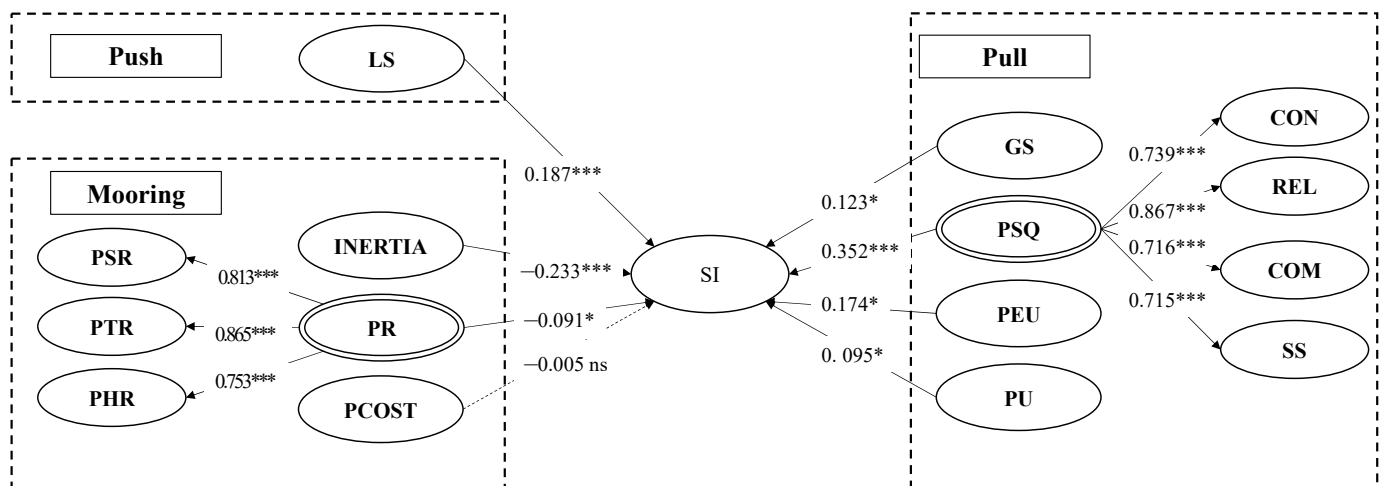
Figure 4. Results of the theoretical modeling analysis. Where *** means *p*-value is lower than 0.001, * means *p*-value is lower than 0.05 but higher than 0.01, and ns means *p*-value is higher than 0.05.

Low satisfaction was the main discussion in this study among the push factors. Similar to former research, this study suggested that the positive effect of low satisfaction on parents' switch to school bus usage was confirmed. Many studies have shown that parents experience some obstacles in the use of current school travel modes (e.g., private cars, public transportation, walking or cycling, etc.), such as traffic density, transfer time and conflict with parents' commute time [89].

For pull factors, the research results show that perceived usefulness (β = 0.213, $p < 0.001$) and perceived ease of use (β = 0.144, $p < 0.001$) have a significant impact on the switching intention, which is consistent with the findings of Dirsehan and Can [90]. Previous study on public transport mode choice has shown that government support and incentive policies have a significant positive impact on an individual's willingness to shift to green transportation [31]. We also demonstrated that government support significantly affects parents' switching intention (β = 0.128, $p < 0.01$), pulling them to use school buses. Perceived service quality had the greatest positive impact on switching intention (β = 0.264, $p < 0.001$) compared with other pull factors. This meant that the service quality was the key to attracting parents to use the school bus to escort their children, which is consistent with Hao et al. [15]. Moreover, the results of this study indicated that the perceived service quality is reflected in four dimensions: comfort (β = 0.790, $p < 0.001$), convenience (β = 0.649, $p < 0.001$), reliability (β = 0.772, $p < 0.001$) and manual service (β = 0.816, $p < 0.001$).

For mooring factors, inertia reflects parents' subconscious attachment to the original travel mode, and the model results revealed that inertia had a significant negative impact on the switching intention regarding school bus usage (β = −0.205, $p < 0.001$). Wieringa and Verhoef [91] reported that individuals might balk at switching when they find it challenging to change service providers or use new methods. Perceived risk is one of many factors influencing people's mobility. Previous studies have demonstrated that a higher perceived risk of bicycling makes individuals less likely to switch to public bicycles [55]. We observed that perceived risk has a significant effect on switching intention (β = −0.101, $p < 0.01$). This result indicated that, as children travel alone on a school bus, parents would consider some of the potential risks, such as bullying injuries and traffic accidents, which hamper parents' intention of using school buses. In addition, we examine the relationship between perceived risk and three first-order risk dimensions, namely perceived safety risk (β = 0.842, $p < 0.01$), perceived traffic risk (β = 0.879, $p < 0.01$) and perceived health risk (β = 0.850, $p < 0.01$). A quantitative analysis of school safety incidents in China by Hu [58] found that crowding and trampling and school bus accidents caused 90.4% of the total number of deaths from safety incidents. This also illustrated why parents are very conscious of their children being involved in traffic accidents during school travel.

4.2. Bayesian Network Analysis

The proposed framework is a reactive second-order model, and the coefficient of the first-order structure evaluates the quality of the measures for the second-order factor. However, the importance of each first-order structure cannot be derived directly from structural equation models. To this end, we attempt to use Bayesian network analysis to rank the importance of the first-order structure. Bayesian network (BN) is a probabilistic directed acyclic graphical model. A Bayesian Network is composed of a set of nodes and edges. Each variable has a Conditional Probability Table (CPT) that depends on the probability of parent nodes and is connected with a subset of the other nodes through directed links. In our study, SEM results can reveal which key factors affect parents' switching intention to use a school bus. The Bayesian network gives us the changes in switching rates with various variables.

4.2.1. Model Construction

Structural learning and conditional probability estimation are the two indispensable steps in the Bayesian Network. In this study, the basic structure of the BN is the SEM-supported hypotheses (Figure 4). A small sample state may increase the randomness in Bayesian modeling. Therefore, we grouped the values of variables before the conditional probability estimation. The independent variables are categorized into three states (from low to high) which follow the order of the three different degrees. The dependent variable is classified with a threshold of 4.

Estimating conditional probabilities depends on datasets and could be implemented by many different algorithms. The expectation-maximization (EM) algorithm can accurately reflect the probability value among nodes, and the convergence speed of EM is fast. Therefore, we choose the Expectation-Maximization (EM) algorithm as the parameter learning algorithm to estimate conditional probabilities and update the modeling. The updated Bayesian network model is shown in Figure 5.
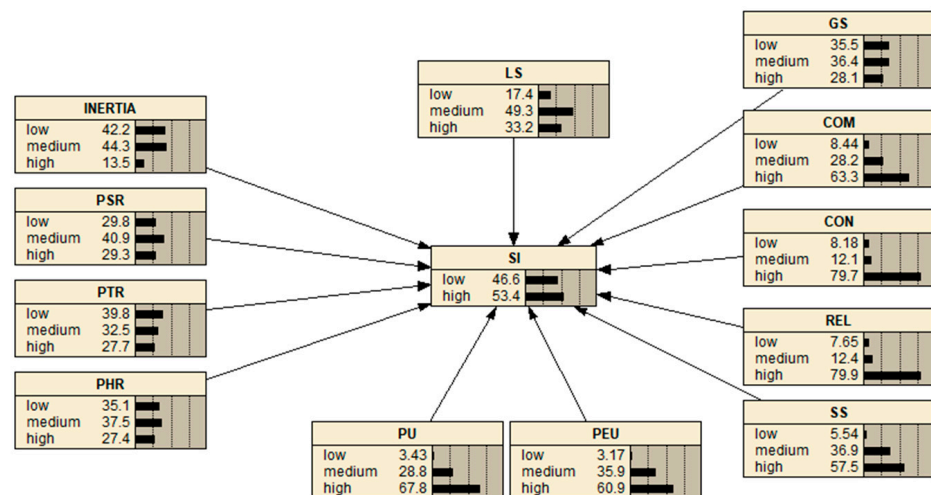

Figure 5. Updated Bayesian Network model.

4.2.2. Model Performance

Bayesian network models usually use error rates and confusion matrices to evaluate model performance [92]. In this study, the sample dataset of 463 cases was randomly divided into 81.64% data (n = 378) to train and 18.36% (n = 85) data to test switching behavior. The result is shown in Table 6.

Table 6. Confusion matrix of the BN modeling.

Confusion Matrix				
Predicted		Actual	Error Rate	Total Error Rate
Low	High			
15	0	Low	0%	
13	57	High	18.57%	15.98%

Table 6 shows that the Bayesian network can respectively predict 100% and 81.43% accuracy of the cases with low and high switching behavior. In addition, Spherical payoff, logarithmic loss, and quadratic loss are effective indices that evaluate the performance of the BN [92,93]. A higher spherical payoff (close to 1), a lower logarithmic loss (close to 0), and a quadratic loss (close to 0) represent better forecasting accuracy [92]. In this case, the value is 0.8957, 0.3126 and 0.1976, respectively. From the above indicators, we can conclude that the BN proposed in this study can provide good prediction ability for the public's intention to purchase private cars during the new normal.

4.2.3. Prediction and Diagnosis

The two applications of BN are prediction and diagnosis [92]. Prediction refers to forwarding inference from cause to effect and can be used to learn the effect of the variation of various factors on the target node [94]. In BN modeling, the actual implementation is to set the low, medium, and high state of an influencing factor as 1.00, respectively, and observe the revised probability of the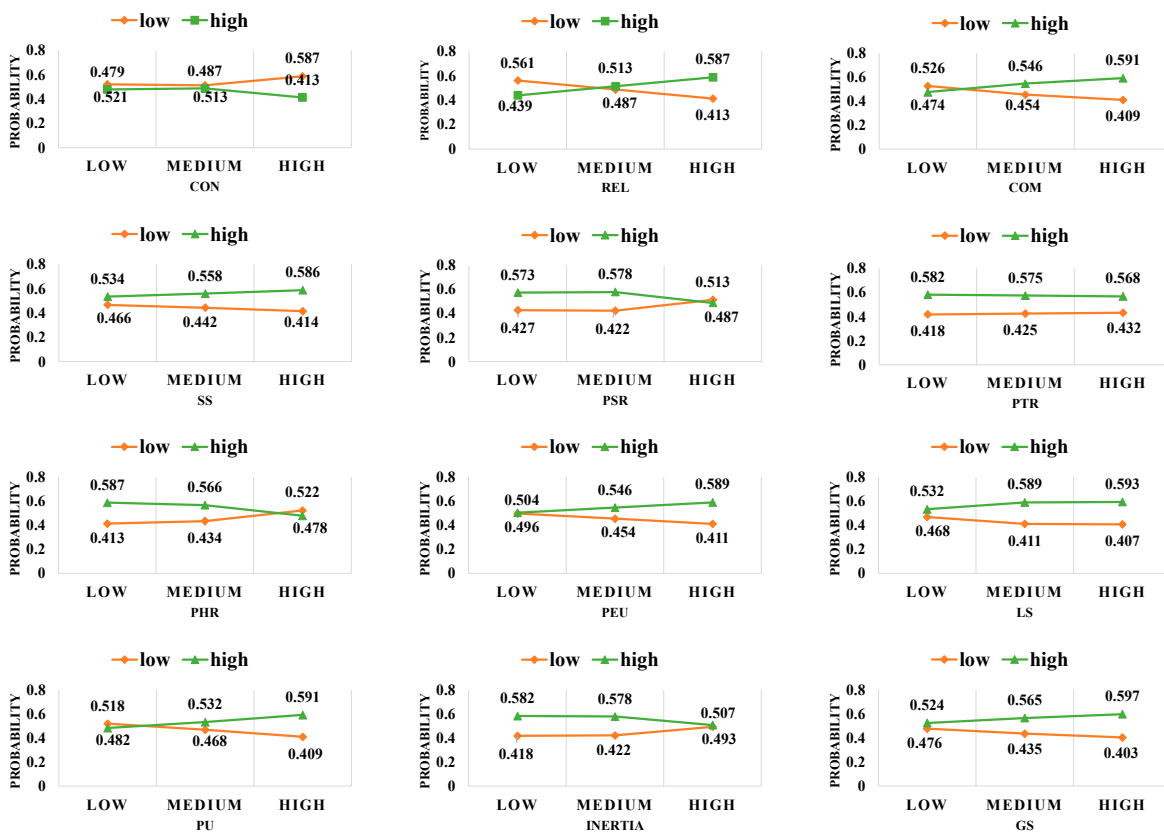 consequent node in the same three states. Figure 6 ion. Reliability, comfort, perceived usefulness, and perceived health risk have a measurable effect on purchase intention.

Figure 6. Prediction of switching intention.

In addition, we assume two scenarios of high perceived risk and high perceived service quality to evaluate the likely consequences of parental switching intention regarding school bus service. BN can predict the changing of target nodes caused by the simultaneous changing of several influencing nodes. This research sets the high probability of four perceived service quality dimensions as 100% to represent a well-performed school bus service (see Figure 7). Another scenario for parental perception after a risky accident sets the high probability of three dimensions of perceived risk as 100% (see Figure 8). Perceived service quality and perceived risk are two psychological factors that reflect the direct stimulation of the school bus service on parents. Observation of the first scenario revealed that the new conditional probability of high switching intention is 59.3%, increasing by 5.9%. The new conditional probability of high switching intention decreased by 2.8% to 50.6% in the second scenario. The changes in the probability of high switching intention between two joint analyses showed that the positive impact of high perceived quality of service is greater than the negative impact of high perceived risk.
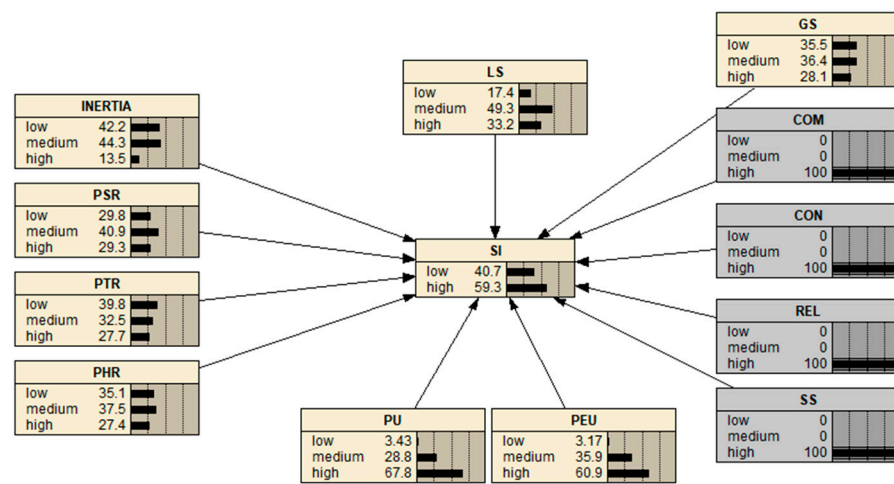

Figure 7. Joint analysis of perceived service quality on switching intention (scenario 1).
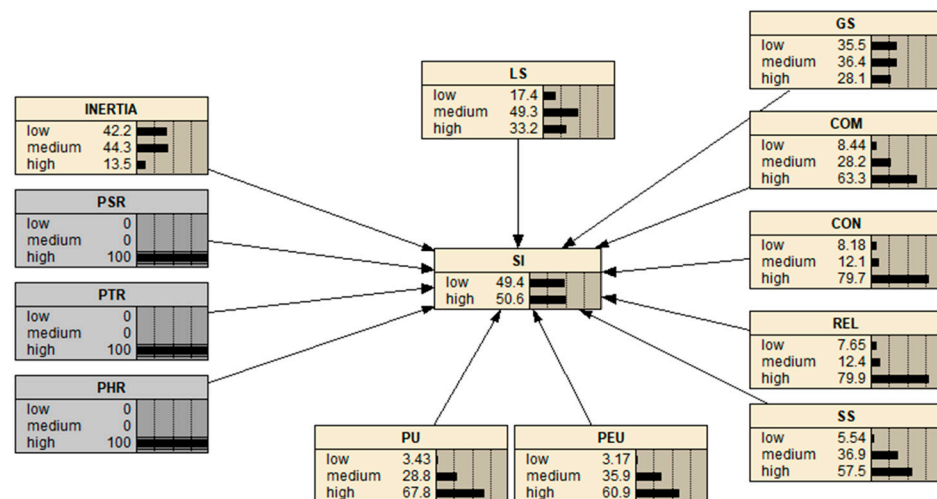

Figure 8. Joint analysis of perceived risk on switching intention (scenario 2).

5. Discussion

This research contributes to the literature by developing a theoretical model and multi-dimensional measures to evaluate parents' switching intentions regarding school buses. In the conceptual model, perceived risk and perceived service quality are organized as formative second-order constructs. Moreover, the influence comparison of two main factors

could provide new insights into parents' perceptions under different circumstances. The key findings from the results are discussed below.

5.1. Theoretical Implications

The theoretical implications are organized based on the questions raised at the beginning of this research. Combined with the popularization of the school bus service, this research attempts to analyze parents' switching intentions by explaining the relationship between psychological variables and switching intention. Moreover, the multi-group analysis could provide the moderating effect of observed variables. The result shows that the conceptual model could explain 72.8% of switching intention, indicating good modeling fitness. This result shows that the PPM model is suitable for explaining parental switching intentions regarding school buses.

5.1.1. Factors Influencing Parental Switching Intention

In the result of the SEM model, psychological factors influencing parents' switching intention were divided into three categories based on the PPM model. All the hypotheses of the conceptual model are supported except H4. The findings of factors influencing parents' switching intention to use the school bus service are discussed as follows.

Push effects:

Push factors are the negative factors perceived by parents regarding their most accustomed mode of travel. Low satisfaction was the main concern in this study among the push factors. Previous studies demonstrated that low satisfaction is a key factor in switching intention [23,42]. The SEM results in this study showed that the more dissatisfied parents are with the current school travel modes due to negative attributes, the more likely they are to choose the school bus to pick up their children for school commutes. This study also showed that the effects of bad weather, lack of public infrastructure, congested travel conditions and a less comfortable public transportation experience contribute to low parental satisfaction. Therefore, the promotion of school buses could start in areas with serious school travel problems so that parents can realize the advantages of school bus travel, and gradually promote it to other areas.

Pull effects:

Parents will be more likely to use school buses when they perceive that their children could easily learn to use school buses or that a school bus service would solve their family's current school travel problems. Moreover, different from the conclusion of Dirsehan and Can [90], the results showed that the impact of perceived usefulness on the switching intention was higher than perceived ease of use. Because the children included in the sample have attended primary or junior high school, they have a certain learning ability that could easily be used learn about school buses. On the other hand, parents will pay more attention to the practicality of school buses. Using school buses will solve the contradiction between parents picking up their children and their commute time by providing a safe and comfortable school travel environment.

Although China's first school bus management regulations were promulgated in 2012, school bus pricing, supervision, safety responsibilities and other issues still do not have clear regulations, which has also led to the slow and uneven development of school buses. The SEM results reflect parents' demand for government-regulated school buses. That is, parents may show a stronger intention to switch to school bus usage if the government refines school bus management regulations and provides substantial subsidies for school buses.

Mooring effects:

Firstly, contrary to previous expectation, perceived cost as a mooring factor had an insignificant effect on school bus switching intention ($\beta = -0.031$, $p < 0.001$), which means that parents' perceptions of school bus cost do not affect their intention to switch towards escorting children by school bus. Xian and Li et al. found that school bus fare was a key factor affecting parents' choices [95,96]. However, some respondents in these studies

have already had an experience with school bus usage, leading to their feelings of being informed and sensitive about school bus costs. In this study, the parents interviewed had never had their children take the school bus to commute before. Wieringa and Verhoef [91] indicated that if individuals have difficulty assessing the reasonableness of a price due to inexperience, then the perceived price may be less important in their switching intention. Therefore, the perceived cost of school buses will not hinder parents' switching behavior.

Quitting the original school travel mode and switching to the use of school buses is a behavioral change for both parents and children. Parents would not only measure the service of the school bus, but also teach their children how to use the school bus in a safe and regulated manner. Parents will likely be inclined to use a more customary mode of travel rather than switching to a school bus if they find the process difficult or if the child is not proficient.

While risk perception seems to be a main barrier, among three dimensions of perceived risk, traffic risk appears to the most influential. Ensuring the safety of students is of paramount concern, and incidents of injuries or fatalities resulting from school bus operational failures can understandably cause significant worry for parents. Next, the impact of perceived health risks is secondary. The space environment inside the school bus is relatively closed, which is likely to cause the spread of viruses. Parents will be more worried about the health of their children. With the optimization of the security environment in China, the number of child abductions and injury incidents is decreasing by the year, so the effect of perceived safety risks is slightly lower.

5.1.2. Effects of Perceived Service Quality and Perceived Risk

The results of the second-order model evaluated by SEM verified the assumption on different dimensions of perceived service quality and perceived risk. All four dimensions of perceived service quality (convenience, reliability, comfort and staff service) and all three dimensions of perceived risk (perceived security risk, perceived traffic risk and perceived health risk) were significantly related to the overall perceived service quality and perceived risk, with different weights. The standardized factor loadings of all the second-order factors range from 0.71 to 0.87 and are statistically significant at the 1% level. High factor loading and significance level indicate that the second-order constructs are well explained by the first-order construct [15]. Also, the second-order model makes the path model more parsimonious and allows researchers to enhance the content comprised of specific constructs [30]. The relationships in the high-order model have not been explored in previous studies in a school bus context.

The results of the SEM model revealed that the coefficient of perceived service quality is higher than perceived risk. A Bayesian Network was conducted to verify the influencing effects of perceived service quality and perceived risk. Comparing the likely consequences of high perceived risk and high perceived service quality, the new conditional probability of high switching intention increased by 5.9% for high perceived service quality and decreased by 2.8% for high perceived risk. The consistent results show that, compared with the perceived risk, the perceived service quality on parental intention to school bus service was more prominent in this case. Cheng [97] came to a similar conclusion, that the power of attractiveness had the highest influence. One possible reason is that parents without school bus experience look forward to the benefits brought by school buses, so they are easily attracted by the high quality of service. Therefore, school bus operators could make more efforts to improve the school bus service [98] instead of working to clarify the risks of taking school buses in advance.

5.2. Practical Implications

Answering the question of what policies could effectively enhance the sustainability of school travel for students in China, this research provides several practical implications for school bus service operators.

During the promotion of school buses, the high service quality of school buses could effectively influence parents' switching intentions. This research revealed that the overall school bus service quality contains four dimensions (convenience, reliability, comfort and staff service). This understanding is essential to helping school bus operators prioritize one strategy or a set of strategies over others. For example, promoting reliability and comfort from low level to high could result in 14.8% and 11.7% of high switching intention. These two dimensions are the most influential factors in switching intentions. As such, school bus operators should formulate strict schedules and minimize schedule-related delays. Implementing a real-time information feedback system might also improve school bus reliability. Such a system provides an accurate arrival time each day so that parents can estimate the departure time from home in advance. Especially on rainy and snowy days, the school bus arrival time is likely to produce deviation. Accurately informing parents of the arrival time could reduce children's waiting time in severe weather and significantly improve the parental perception of the school bus service quality. Ensuring one seat for each child and cleaning school buses could improve school bus comfort levels.

Parents who have not experienced school buses might pay more attention to the positive factors of the school bus. However, the risks associated with a travel mode would be a key factor in ensuring continuous usage in the long term [30]. This research also verified that perceived risk is a key factor that hinders parents from using school buses to escort their children. Parental perceived risk has different aspects, and this research verified three dimensions (perceived traffic risk, perceived health risk and perceived safety risk). Based on the prioritization, some improvement measures can be proposed. Traffic risk is the highest worry for parents. Traffic accidents involving school buses are often relevant to road conditions, drivers' driving behavior and school bus mechanical conditions. Policymakers should set the "yield to pedestrians" logo at each school bus station to provide safe conditions for children getting on school buses. Another measure to ensure the safe traffic condition of the school bus is to ensure road priority for the school bus. Establishing a strict review mechanism contributes to hiring experienced and responsible drivers. School bus purchases should be in line with the National Standard on Special School Bus Safety, guaranteeing the safety quality of school buses. The outbreak of COVID-19 raised the transmission problem throughout the world, and public transport was therefore suspended. Under the epidemic context, parents are concerned more about whether their children are exposed to the risk of infection while taking school buses. Therefore, the promotion of the school bus service must take epidemic prevention and control measures, such as daily disinfection, temperature measurement, and mask-wearing. Finally, detectors installation could effectively reduce the social crime rate. Setting up a monitoring system in school buses and stops would bring a great benefit to children's security.

6. Conclusions

In summary, this research explored the direct impacts of psychological constructs and the moderating effects of observed variables on parental switching intention toward school bus usage. The findings of this research contribute to both theory and practice. For theoretical implications, the PPM framework is verified as applicable to understanding parental switching intention to use school buses in the promotion stage. During the COVID-19 epidemic, the three dimensions of perceived risk and the four dimensions of perceived service quality were verified, and the relationship between their effects was analyzed. A BN analysis illustrated that the new conditional probability of high switching intention increased by 5.9% for high perceived service quality. In terms of practical implications, this research found that improving the school bus service would become more effective compared to clarify the risks of taking school buses during school bus promotion.

There are several limitations in the present research that warrant discussion. First, the online cross-sectional data limit analyses of the whole population. In order to further investigate the relationship between switching intentions and various influencing factors, future research could benefit from utilizing a larger sample size of panel data. This would

allow for a more comprehensive analysis of the complex factors that contribute to parents' decision-making processes when it comes to utilizing school bus services. Second, all data were self-reported, thus subject to recall bias and desirability response. Third, since the switching intention is rather complex, many other factors might also influence parental switching intention towards school buses, such as distance, alternative options, affordability and time. Push factors for different travel modes also need further analysis. Hence, future research could extend to more factors. Furthermore, additional empirical evidence is needed to support the moderating effects of mooring factors on the relationship between push/pull factors and switching intentions. Finally, it should be noted that the sample for this study was collected from parents who have had no experience with school bus use, which may limit the generalizability of the results. In future research, it would be worthwhile to collect samples from a specific city and include the views of parents who have had experience with school transport, including their perceptions of the quality of service provided by school buses. This would provide a more comprehensive understanding of the factors that influence parents' decisions to switch to using school buses for their children's transportation.

Appendix A. Questionnaire Items Used in This Research

Constructs	Items	Sources
Perceived Security Risk (PSK)	PSK1: I am concerned that my child could be bullied or bullying by other children on the way to the school bus or on the school bus. PSK2: I am concerned that my child could be harassed or hurt by other children on the way to or on the school bus. PSK3: I am concerned that my child could be molested or abducted by an adult on the way to the school bus.	[56]
Perceived Traffic Risk (PTR)	PTR1: I am concerned that school bus drivers may be speeding, fatigued driving, drunk driving, and other violations that may threaten the safety of children PTR2: I am concerned that the school bus will break down in a way that threatens the safety of the children. PTR3: I am concerned that the school bus will collide with another vehicle while in motion and cause injury to the children.	[30,99]
Perceived Health Risk (PHR)	PHR1: I am concerned that my child may be infected with an epidemic by traveling with other students on the school bus. PHR2: I am concerned that my child may be at risk of contracting infectious diseases such as COVID-19 by riding the school bus. PHR3: I am concerned that the air in the school bus is not well-ventilated and that the children may catch epidemic diseases.	[52,100]

Constructs	Items	Sources
Perceived Cost (PCOST)	PCOST1: I think the fare of the school bus is unreasonable. PCOST2: I think the cost is higher for the children's commute to take the school bus. PCOST3: I think the school bus fare is too high.	[29]
Inertia (INERTIA)	INERTIA 1: I think it would be a hassle to have children switch to taking the school bus to and from school after providing school buses. INERTIA 2: Even though the school provides buses, I still used to let my children travel to and from school in the current way. INERTIA 3: I do not plan to make changes that switching from the current way to using the school bus to commute after the school provides it.	[26]
Convenience (CON)	CON1: The school bus is a convenient way to get around the school without the need for a midway transfer. CON2: The school bus can take children directly to school which is very convenient. CON3: The route of the school bus will be reasonably planned to save children's time to and from school.	[99]
Reliability (REL)	PBC1: The school bus departs at a reasonable time that would not delay the children's classes or their return home. PBC2: The school bus is able to escort my child to the station on time as specified. PBC3: The school bus can follow the prescribed route and has a fixed pick-up and drop-off place.	
Comfort (COM)	COM1: I think the school bus is not crowded and the ride is very comfortable. COM2: I think the school bus can ensure one seat for each student and there is no shortage of seats. COM3: I think the environment inside the school bus is neat and comfortable.	
Staff Service (SS)	SS1: The school bus has special staff to follow who will provide timely and reasonable care when children have an accident (e.g., seasickness, physical discomfort, etc.) SS2: The special staff can inform me of my child's arrival when the school bus arrives at the school. SS3: The special staff can promptly remind my child to get on or off the bus when the school bus arrives at a station.	
Government Support (GS)	GS1: I think the government will make substantial subsidies (e.g., fare subsidies) to promote the usage of school buses. GS2: I think the government will strengthen the management of school buses and improve the laws and regulations related to the operation of school buses. GS3: I think the government will subsidize the purchase and operation of school buses.	[101]
Switching Intention (SI)	SI1: I would like to let my child use the school bus to get to and from school instead of after the school provides a school bus. SI2: I want to change the current mode of transportation for children to and from school and switch to school buses after the school provides school buses. SI3: I plan to let my children use the school bus to and from school after the school provides a bus.	[26]
Perceived Usefulness (PU)	PU1: The school bus could help me solve the problem of children traveling to and from school (e.g., parents can't pick up their children but worry about the safety of their children going to and from school by themselves), which is a very practical way to travel. PU2: Taking a school bus is an effective way to improve the safety and comfort of school travel. PU3: Overall, school buses could be a very practical way to travel to school.	[90]
Perceived Ease of Use (PEU)	PEU1: My child could easily learn how to ride the school bus to and from school. PEU2: I think children could easily master the school bus ride (e.g., finding the stop, finding their seat, etc.). PEU3: The school bus is an easy way to get around with special staff to remind children to get on and off the bus on time.	[102]

Constructs	Items	Sources
Low Satisfaction (LS)	LS1: I am not satisfied with the current way my children travel to and from school. LS2: I think the current way of traveling to and from school for my children is problematic in terms of safety and comfort, which makes me dissatisfied. LS3: I think the current way of traveling to and from school for my children does not meet my expectations in terms of safety, comfort, etc.	[103]

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