

Journey Experience and Well-being of High Speed Rail Commuters -The case of Suzhou-Shanghai Part of High Speed Railway

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Journey Experience and Well-being of High Speed Rail Commuters

-The case of Suzhou-Shanghai Part of High Speed Railway

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MSc Transport and City Planning

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Being a dissertation submitted to the faculty of The Built Environment as part of the requirements for the award of the MSc Transport and City Planning at University College London: I declare that this dissertation is entirely my own work and that ideas, data and images, as well as direct quotations, drawn from elsewhere are identified and referenced.

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Table of Contents

Acknowledgement	2
Abstract	6
CHAPTER 1 – Introduction	7
1.1 Research Context	7
1.2 Research Background.....	8
1.3 Research Question and Aim.....	10
1.4 Chapters Overview.....	11
CHAPTER 2 Literature Review	12
2.1 Conceptualising Well-being	12
2.2 Customer Satisfaction, SWB and Journey Experience.....	14
2.3 Previous Research of Journey Experience and Well-being.....	15
2.4 Literature Conclusion.....	19
Chapter 3- Methodology.....	20
3.1 Suzhou-Shanghai.....	20
3.2 Questionnaire Design.....	23
3.3 Survey.....	26
3.4 Data Sampling	27
3.5 Data Preparation and Analysis.....	30
3.6 Ethics Statement	30
3.7 Limitation	31
Chapter 4: Analysis and Discussion.....	32
4.1 User Journey Experience.....	32
4.2 Well-being.....	38

4.3 Investigating the Linkage between Journey Experience and Well-being	39
4.4 Discussion.....	45
4.4.1 Journey Experience	45
4.4.2 Linking Journey Experience and Well-being	45
4.5 Policy Implications	46
Chapter 5 Conclusion	49
Reference	52
Appendix 1: Questionnaire	63
Appendix 2: Approval of the Risk Assessment.....	67

List of Tables

<i>Table 1 Different approaches and definition of Well-being (made by author)</i>	13
<i>Table 2 Previous Studies of journey experience</i>	17
<i>Table 3 Satisfaction with travel</i>	26
<i>Table 4 Commuter's Profile</i>	29
<i>Table 5 User disgruntlement index</i>	34
<i>Table 6 Well-being score</i>	38
<i>Table 7 Linear regression of commuters' characteristics and well-being</i>	39
<i>Table 8 Pearson analyse of the relationship between journey experience and well-being</i>	41

List of Figures

<i>Figure 1 Rent in different district, Shanghai</i>	22
<i>Figure 2 Theoretical framework</i>	23
<i>Figure 3 Frequency of intercity commute</i>	29
<i>Figure 4 Importance level of different factors</i>	33
<i>Figure 5 User disgruntlement of different factors</i>	33
<i>Figure 6 Scores of user disgruntlement</i>	35

Abstract

In this study, the author explores the linkage between the journey experience of High-Speed Railway and well-being from the Asian perspective. The study firstly justifies the case study by arguing High-Speed-Railway, as a burgeoning transportation means worldwide, is influencing daily travel behaviour. Then, a sample of 168 intercity commuters using High-Speed Railway collected from Suzhou in China is presented. Through face-to-face and online surveys, the respondents stated their expectations and their actual journey experience of High-Speed Railway services retrospectively. User disgruntlement method is applied to investigate both instrumental and affective aspects of the journey experience. The satisfaction with travel is evaluated before the data is used to investigate the link between journey experience and well-being. Finally, the effect of journey experience on well-being is analyzed with Pearson correlation coefficient analysis in SPSS. Results suggest the significant impact of the instrumental aspect of the service on commuters' well-being, especially the punctuality and accessibility to the stations. Besides, some of the affective factors also show significant influence on journey experience and in turn, well-being. The study ends by providing the policy implications of improving service quality and suggesting further research focus.

CHAPTER 1 – Introduction

1.1 Research Context

From the very early era when nomadic herders regularly travelled to survive, to the 21st century when human beings rely heavily on transport to pursue a sustainable life, transport is always an essential element in the process of shaping cities (Zhang et al., 2007; Banister et al., 2013) and developing civilizations (Gang and Bandurski, 2011). Fuelled by evolving technology, transport brings society into the 'era of transition' with both unprecedented benefits and harm (Gang and Bandurski, 2011).

Labeled as a 'make and break' issue of the global climate agenda (Hickman et al., 2017), transport is seen as the key to decrease the human footprint. Indexes such as carbon emission and energy consumption of transportation are being closely monitored by policy-makers and planners (UNECE, 2019; Hickman et al., 2017).

Economically, strategic consultants and economists are keenly observing the investment trend, which indicates that transport will witness around 5% annual growth rate of investment in the next five years and devote the most substantial amount of investment as a single sector in the next 20 years (PwC, 2015; Infrastructure Outlook, 2015). Extensive research has conducted a cost-benefit analysis for every existing road, bridge, and train line.

Previous research successfully filled the gap of environment and economic dimensions in sustainable transport by providing numerous theories, indicators, and empirical studies. However, the social aspect of transport has not been gaining major attention until recent years, when the UK's social inclusion agenda was produced and acknowledged (Urry, 2016). Stanley and Stanley (2007) claimed that well-being 'should be the ultimate goal of transportation policy-makers; otherwise, transport will only develop for the sake of mobility. In that situation, various social issues such as social exclusion and inequity will arise, which will decrease the quality

of life and in turn, social sustainability (Fischer and Amekudzi, 2010). Therefore, investigating the link between the social effect of transport and well-being is a continuing concern within sustainable transportation development.

This dissertation aims to evaluate the social impact of an accessible transportation mode in the 21 century – High-Speed Railway (HSR). With the goal of sustainable transport, HSR has been a popular option since 1964, when the first HSR was built in Japan (Hall, 2009). HSR was then widely promoted in Europe in the 1970s due to the petrol crisis. Widely accepted benefits such as high capacity, reduction of traffic congestion, and efficient land and energy use made HSR a popular choice in 23 countries. Until 2017, the EU had HSR lines of 9067 km, second only to China, which had 26,869 km in operation (EESI, 2018). However, as usual, the social aspect has been largely ignored when HSR is scrutinized with the criteria of sustainability. Therefore, this dissertation attempts to investigate the transport-related well-being effect of HSR in China.

1.2 Research Background

During the last thirty years, HSR has gained growing attention from policy-makers and planning scholars. In response to political agendas that pursue car-use reduction (OECD, 2008; Vlek, 2007), a considerable amount of research has examined the effects of instrumental factors such as mobility on modal shift and travel behaviour (Ettema et al., 2011).

Since HSR allows travelers to reach longer distances in a shorter time (Sandow, 2008), various studies have proved that HSR is a powerful tool to influence modal shift. Fröidh (2005) stated that HSR makes travelers shift their travel mode from car to HSR based on the Svealand line case in Sweden. Åkerman (2011) assumed that 20% of the passengers in Sweden would travel by HSR instead of air. Moreover, Banister et al. (2013) underlines the power of HSR that can 'shrink spaces and shape

places'. Owing to the improved mobility, HSR system provides an appealing alternative for the medium- and long-distance commuters (Garmendia et al., 2012). The new travel behaviour accelerates metropolitan integration through a more frequent labour, service and goods exchange between cities, which can be observed in countries such as Spain, France, Japan, and Germany (Guirao et al., 2017).

Gradually, instrumental factors such as frequency and travel time, become almost the exclusive criterion to assess the benefit of HSR on individuals. Studies are particular keen on investigating commuting trips for their great influence on regional economies and development (Guirao et al., 2017). For instance, Menéndez et al., (2002) claimed that for commuting trips, HSR is a possible alternative to cars when travel time on HSR is between 30 to 60 minutes. Moyano (2016) used the HSR timetable, travel times, and tickets cost to evaluate commuting efficiency.

Undeniably, research successfully proved that instrumental factors of HSR play a vital role in influencing psychical movability. Such approaches, however, have failed to address the influence of affective aspects of the journey and examine the actual travel impact on individuals. On the other hand, Kahneman et al. (1999) advocated subjective well-being, including cognitive and affective aspects, should be used to assess the benefits of transportation. Ettema et al. (2010) indicated that to evaluate the benefits of travel improvements properly, researchers should measure the actual journey experience rather than anticipated experience, which is mainly based on instrumental factors. Bergstad et al. (2011) claimed that improved transport service leads to changes in journey experience and in turn, well-being. Ettema et al. (2011) extended the argument by building a model examining the relationship of journey experience and subjective well-being to accommodate the agenda goals. Diener (2009) advocated that establishing a relationship between well-being and the service is a powerful tool for modal shift and policy-making.

This dissertation, therefore, intends to fill the current research gap by examining the journey experience of HSR results from service quality, and its impact on the well-being of intercity commuters. Yangtze River Delta (YRD) in China is an ideal place to conduct the research.

China has witnessed one of the biggest mega-infrastructure--HSR systems development. In 2004, *Mid- to-long Term Railway Development Plan* emphasized the importance of HSR as the most crucial instrument to counter the 2008 economic recession (Wang et al., 2013). The plan set the target of a 25,000 km HSR grid and \$539 billion as total investment figure. Until 2017, the rail lines of HSR totalled 22,000 km, which is longer than all other countries combined (Economist, 2017). Generating almost one-fourth of the GDP in China, YRD is not only witnessing large numbers of intercity commuters, but the ongoing projects are aiming to continue improving the HSR system in the region (China Statistical Yearbook, 2017).

1.3 Research Question and Aim

The previous sections highlight that well-being is a crucial goal in the transportation field and a vital criterion to assess the benefits of transportation. However, the previous research into HSR has been solely concerned with mobility and its impact on the economy and spatial connection. Therefore, there is a void concerning the relationship between HSR, a rapidly growing transportation means, and well-being. In light of the above, this research seeks to answer the following main question:

*To what extent does the HSR influence the well-being of
Suzhou-Shanghai commuters who travel regularly?*

In particular, the formulation of an appropriate response to the main question also requires the identification of suitable answers to a series of interrelated research sub-questions, which are indicated below:

- Sub-question 1:

Why are there long-distance intercity commuters in Yangtze River Delta?

- Sub-question 2:

What are the journey experience and expectations of Suzhou-Shanghai commuters by examining relative instrumental and affective factors?

- Sub-question 3:

What level is the transport-related well-being of HSR users?

- Sub-question 4:

What is the link between user experience and commuter well-being?

[1.4 Chapters Overview](#)

In Chapter 2, the dissertation will firstly set the economic and social background of the Suzhou-Shanghai region through a literature review to explain the reason behind the intercity commuters in the Chinese context. It will next examine the journey experience and well-being level respectively and then the relationship between the two. Chapter 3 will present the methodology and build up the theoretical framework, explaining the ethics and limitations. Chapter 4 will discuss the findings from the results and provides suggestions on the topic. A conclusion of the research follows in Chapter 5.

CHAPTER 2 Literature Review

2.1 Conceptualising Well-being

Well-being is nowadays a crucial element to incorporate into policy decisions. The HM Government (2005) underlines obtaining a better grasp of well-being. Diener et al. (2004) proposed a well-being index to facilitate the policy decisions to go 'beyond money' so society will be further improved.

There are two main primary streams of well-being in the psychological research, eudaimonic and hedonic, which focus on cognitive and affective aspects respectively. The eudaimonic framework asserts people can achieve psychological well-being through fulfilling goals and discovering human potential (Ryff and Singer, 2008; Jenkins et al., 2008) while hedonic well-being believes subjective factors such as feelings and affection are at play (Kahneman et al., 1999). Different approaches have emerged to interpret well-being based on these two frameworks (Table.1). However, most approaches of well-being only accentuate single dimensions of well-being (Dodge, 2012). For example, the Preference Satisfaction approach (PS) believes well-being is primarily influenced by whether desires are met (Parfit, 1984). However, with exclusive attention on the affective aspect, it neglects the cognitive aspect. Realizing the bias of previous attempts at comprehending well-being, Diener et al. (1985) claim from a holistic perspective, that well-being is the combination of individual cognitive and affective evaluation of the quality of life, and that later on this evolves into Subjective Well-being (SWB). Therefore, SWB is by definition an individual cognitive evaluation of the quality of life (Diener et al., 1985), based on three components, positive affect (PA), negative affect (NA) of instant experiences, and cognitive evaluation.

Table 1 Different approaches and definition of Well-being (made by author)

Approach	Proposition	Focus	Used Area
Preference Satisfaction	Fulfilling the different desires and requests of individuals	Subjective desires getting fulfilled and its impact on well-being	<ul style="list-style-type: none"> ❖ Psychological area: <ul style="list-style-type: none"> - Evaluating well-being based on whether desires is met (Parfit, 1984) ❖ Economic area: <ul style="list-style-type: none"> - Using PS to observe and analyse consumer behaviour (Dolan and Kahneman , 2006)
Objective List	Meeting a list of attributes such as economic resources, political freedom and good health.	Objective factors that draw on theoretical accounts of what is valuable to well-being.	<ul style="list-style-type: none"> ❖ Psychological area: <ul style="list-style-type: none"> - Developing different index for well-being (Rawls, 1971) ❖ Public health area: <ul style="list-style-type: none"> - Measuring public health by using objectives list (University of Waterloo, 2012).
Subjective well-being	Forming individual cognitive evaluation of quality of life or of particular services	Both subjective and objective factors affect subjective well-being.	<ul style="list-style-type: none"> ❖ Public policy area: <ul style="list-style-type: none"> - Collecting SWB data as official surveys for policymaking, including housing, health, transport (OECD, 2008).

As a multi-dimensional construct (Diener, 2009), SWB can also be seen as the result of various domain-specific SWB (Schimmack, 2008), and as being influenced by context-specific factors such as different types of consumption (Diener & Seligman, 2004). Therefore, SWB is proposed as a measure of people's satisfaction with material and immaterial resources (Kahneman et al., 1999) and gains popularity in evaluating public goods and services (Diener et al., 2009). To date, SWB has been emerging as a critical instrument in justifying policy decisions in transportation (Ellaway et al., 2003). A milestone research raises the question of how travel context affects the SWB, and by improving the measurement Satisfaction with Travel Scale (STS), the study was able to suggest the strong linkage between journey experience

and SWB (Ettema et al.,2011). Based on this argument, this dissertation is going to examine the relationship between the journey experience of HSR and SWB among intercity commuters. The formation of well-being theoretical background is based on SWB. Here, well-being is defined as a stable 'day-to-day good feeling,' which is in respect to both cognitive and affective aspects.

2.2 Linking SWB and Journey Experience through Customer Satisfaction

Examining customer satisfaction is a widely accepted technique to evaluate SWB derived from transport. Assuring the relationship between SWB and customer satisfaction, Ettema et al. (2010, p 726) states: 'customer satisfaction is a specific form of domain-specific SWB.' Instead of explaining SWB in respect of the whole life domains, domain-specific SWB underlines specific products or services intending to satisfy specific needs. In terms of the transportation system, customer satisfaction is strongly connected to whether the transport system provides satisfying service and meets users' needs.

However, the method used to measure travel satisfaction once is criticized for overlooking the affective aspect. Lots of transportation researchers have intended to establish the travelers' satisfaction and travel improvements through the utility-maximization theory (McFadden, 2001), which, however, fails to acknowledge the significance of both positive and negative experiences (Wilson & Gilbert, 2003). The increasing attention on the psychological aspect of the transportation field started to fill this gap. The root can be traced back to when the statement 'getting there is half the fun' gained popularity (Mokhtarian & Salomon, 2001, p. 709). Following up, Ellaway et al., (2003) stated that a feeling of autonomy, prestige, and protection is attached to car usage, which is also proved to cause anxiety and stress. The utility of travel, therefore, argued to be perceived not just as a 'derived demand' and

examined by instrumental factors, but as a whole experience, that also covers the affective aspect of transportation (Ellaway et al., 2003).

As a breakthrough, Ettema et al. (2011) claim that journey experience rather than utility theory should be used to assess the travelers' satisfaction accurately. 'Journey experience' is adapted to the transportation context from 'customers experience' in economics, referring to the individual holistic evaluation arising from the interaction between passengers and all the tangible and intangible factors across all moments of interacting with the transportation service (Meyer and Schwager, 2007). There is a large number of published studies (e.g., Anable and Gatersleben, 2005; Stradling et al., 2007) that explain the rationale of the linkage between the journey experience and the level of customer satisfaction. To explain, travelers' satisfaction is firstly affected by incidents experienced during interaction with transportation services. Repeated incidents during using the services (such as daily commuting) shape an accumulated evaluation towards the transport service (Bergstad et al., 2011).

2.3 Previous Research of Journey Experience and Well-being

Previous research has established the link between journey experience and SWB through customer satisfaction of instrumental and affective dimensions (Table. 2). Traditionally, only instrumental factors such as travel time, efficiency, and cost account for influential attributes when accessing satisfaction with travel (Hickman et al., 2015). However, as the journey experience results from direct and indirect interaction between passengers and transportation service, a more holistic view focusses on the service quality and widens the attributes to include affective factors. For instance, Stradling et al. (2007) pointed out that satisfaction with bus services results from a range of affective factors such as cleanness and comfort. Carreira et al., (2013) used affective factors such as information availability and the level of comfort to evaluate journey experience of public transport. Taken together, these

studies support the notion that service quality is an essential determinant of journey experience, which leads to different levels of SWB.

Table 2. Previous Studies of journey experience

Transport modes	Trip Purpose	Work	Findings
Multiple Modes	Work + Travel (Anable and Gatersleben, 2005)	Establish the role of instrumental and affective attributes for work and travel purpose by various travel means.	The paper shows work journeys attach more importance to instrumental aspects, especially convenience, whilst leisure journeys give equal importance to instrumental and affective aspect. The author, however, underlines the affective factors such as freedom and no stress were all important.
Public Transport			
Bus	Leisure travel (Stradling et al., 2007)	Develop the 'user disgruntlement' to assess the service quality and customer satisfaction	The result shows 'user disgruntlement' can be adapted in the transportation field, exploring instrumental and affective elements that need improvement the most.
	All purpose (Carreira et al., 2013)	Discover the instrumental and affective factors that influence journey experience of bus service.	The paper finds out experience factors (software and hardware of transportation) both has impact on bus travel experience.
High Speed Railway	All purpose (Zhen et al., 2018)	Establish the role of instrumental factors on SWB.	The research claims that the integration of HSR with other public transport plays a vital role in SWB.
	All purpose (Hickman et al., 2015)	Discover the journey experience of HSR interchange	The study suggests attitude/affective factors need more attention in improving service of interchange of HSR.
	All purpose (Cao and Chen, 2011)	Explore the influence of service quality on SWB and in turn customer loyalty	The study indicates the service quality such as comfort and safety and direct and positive effect on SWB.
	All purpose (Kuo and Tang, 2013)	Assess service quality, customer satisfaction and modal choice in terms of elderly people.	The results argue service quality not only influences journey experience, but also the corporate image. Those together, cause the behavioural intention.

Still, as a rather new transport means, there are several research gaps of HSR regarding this topic. Firstly, whilst some research has been carried out on journey experience and SWB of HSR, there have been few empirical investigations into commuting trips. However, as one of the components of SWB is cognitive evaluation, which results from the frequency of positive and/or negative affect, the frequency of usage is an important variable when studying SWB. As Bergstad et al. (2011) argue, daily travel itself is influential on individual's mood and SWB. Therefore, following the hypothesis that work trips happen more frequently than leisure trips, this dissertation targets the commuters as a focus group.

Moreover, the focus of most previous research was only part of the HSR service rather than every interaction between service provided and passengers. For instance, there is one only focussed on the access and egress of HSR (Zhen et al., 2018), while other research only underlines the service in the hub (Hickman et al., 2015) or on-board (Kuo and Tang, 2013). To properly evaluate the service provided by HSR, it is necessary to include the whole journey experience from accessing the HSR station, waiting in the hub, traveling on-board to egressing the HSR station.

In addition, up to now, although instrumental factors have been proved crucial in other transport modes, far too little attention has been paid to affective factors when it comes to HSR. For example, Cao and Chen (2011) used instrumental criteria such as ticket prices to assess customer satisfaction of HSR in the Yangtze Delta River. Also, Kuo and Tang (2013) took account of the satisfaction with facilities and services to analyze the satisfaction level. It is evident that more empirical evidence should be collected to enhance the understanding of HSR journey experience, particularly pertaining to affective aspects, and its impact on well-being. Therefore, in order to fill the research gap, this research aims to investigate the intercity

commuters' well-being based on their regular trips between Suzhou and Shanghai on HSR.

2.4 Literature Conclusion

With shifting attention to the social aspect of sustainable transportation, the significance of well-being and its implications for policy decisions has been demonstrated across a great deal of prior literature. Out of several approaches to comprehend well-being, SWB is argued to be the most appropriate approach to use in the transportation field as it reflects customer satisfaction, which covers both individual cognitive and affective evaluation from travelers (Diener et al., 2009).

Journey experience then gains popularity as a measure of SWB after utility-maximization theory has been criticized for failing to acknowledge the significance of affective factors (Wilson & Gilbert, 2003). Few links have been established between affective factors and journey experience since Stradling et al. (2007)'s work.

However, more empirical evidence is needed to obtain a deeper understanding of the affective aspect and journey experience. Moreover, previously published work is limited to automobiles and public transportation such as buses, and few studies have investigated the journey experience of HSR. Furthermore, there is even less attention paid to regular intercity HSR commuting studies. Thus, based on the milestone research conducted by Ettema et al. (2010) which raises the question about how service quality of transportation can lead to a change in well-being, this study attempts to examine how service quality of HSR influences well-being through satisfaction with travel.

Chapter 3- Methodology

This chapter describes the case study of Suzhou and Shanghai in detail, the theoretical framework that acts as the basis of the survey design and the procedure of data collection and analysis. It also provides the discussion of ethics and limitations.

3.1 Suzhou-Shanghai

HSR between Suzhou and Shanghai in the Yangtze Delta River has been chosen as case study in order to investigate the research question and provide more empirical evidence to deepen the understanding of journey experience and well-being from the Asian perspective. As one of the most burgeoning economic region, Yangtze Delta River witnesses surging numbers of inter-city commuters in this development stage. According to Niu et al. (2018), the inflow of commuters to Shanghai numbers over 40,000 people and of that number, outflow reaches around 35,000 per day. Among the 16 surrounding cities of Shanghai, Suzhou has a crucial role by taking up 92.4% of total inter-city commuters. Therefore, the Suzhou-Shanghai part of HSR is potentially a valuable and meaningful option to investigate as the case study.

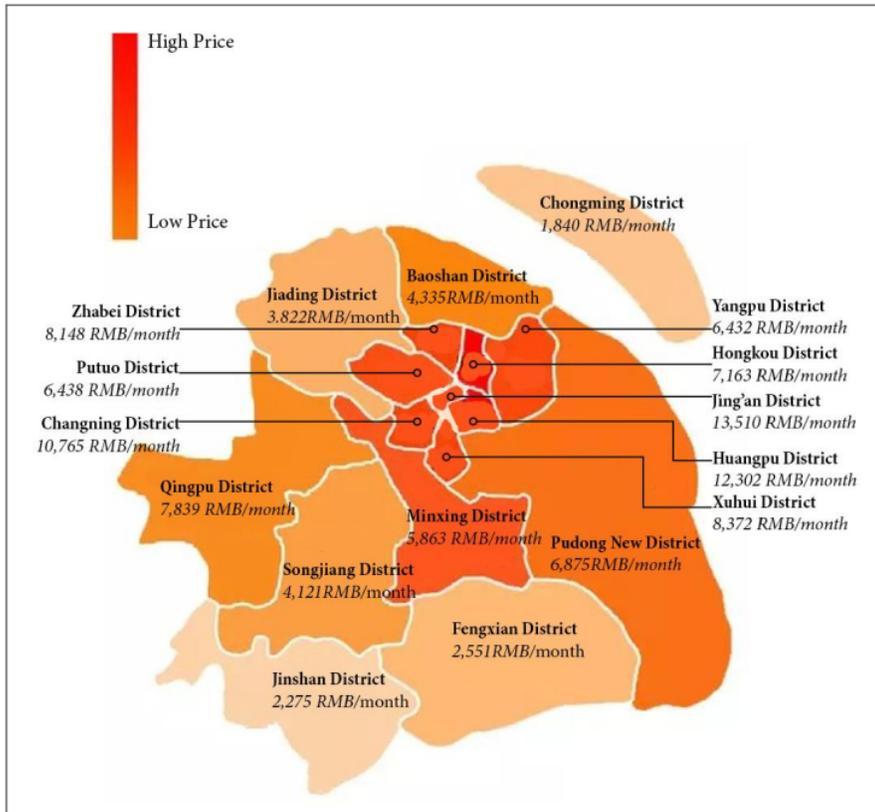
By reviewing the literature, the inter-city commuting between Suzhou and Shanghai can be concluded as three main reasons: economy and spatial integration, improvement in HSR technology and salary and living cost mismatch.

Strategically, according to the *Master Plan of Shanghai (2017-2035)*, Shanghai will actively integrate nearby cities such as Suzhou to form a better-integrated metropolitan region (Shanghai Government, 2017). Also, division of labor and industrial gradient transfer in the Yangtze River Delta region fuels the regional integration. Numerous companies place their Research & Develop Centers and

headquarters in Shanghai while distributing production bases in other cities in the Yangtze River Delta. Therefore, personnel flow within the companies causes a more frequent labor exchange and in turn assists the ongoing and further regional integration.

A spurt of progress in the rail system in the Yangtze River Delta plays a vital role in promoting the Shanghai Metropolitan Area. Especially HSR, which increases the attractiveness of inter-city commuting due to the improved speed. HSR, which reaches an operational speed of 350 km/h (National Railway Administration, 2019), does not only provide a much more convenient and efficient commuting routine, but also the possibility to live in smaller cities and enjoy relatively low living costs. On the other hand, the mismatch of worker earnings and housing costs also catalyses the regional commute (Cervero, 1989). Only three remote districts offer flats with the rent below 3,000 RMB per month, whilst 15 other districts in Shanghai are witnessing one of the most exorbitant rents in China, which varies from 3,800 to 13,510 RMB per month, (as shown in Figure.1) from suburban areas to the city center. In the meantime, the average income, according to the Bureau of Statistics of Shanghai (2018), is 7,131 per month in 2017. The massive gap between income and rent drives workers out of the city center to suburban areas and even other cities.

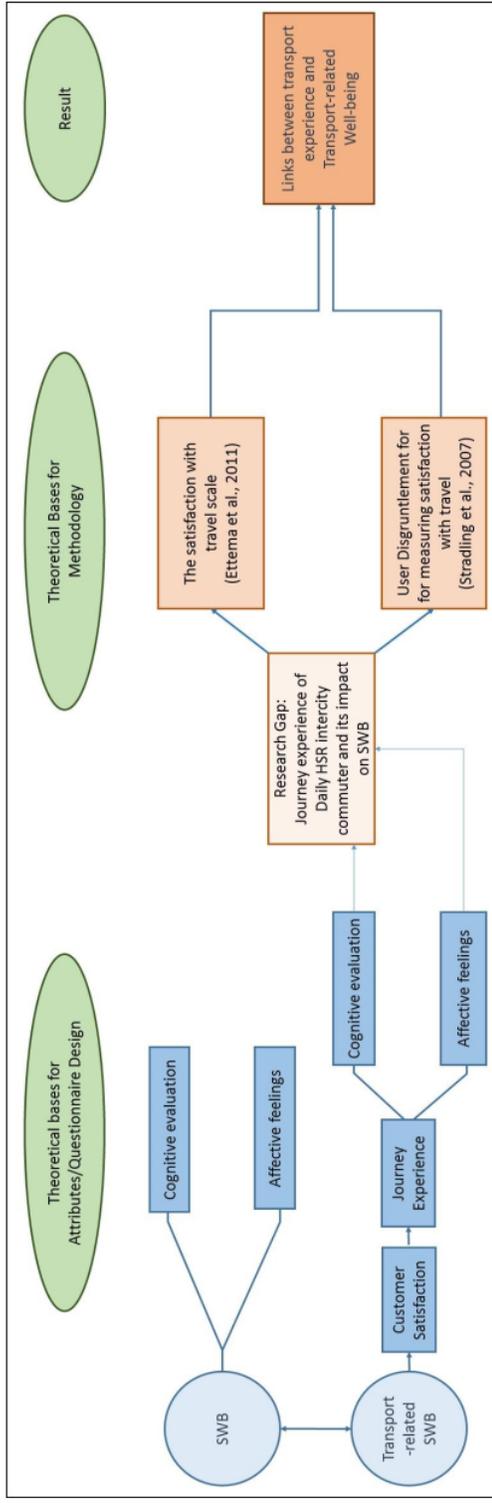
Figure 1 Rent in different district, Shanghai



3.2 Questionnaire Design

In order to fill the gap of the previous literature, a framework is designed to answer the research question (Figure.2). Based on the two previous studies, Satisfaction with Travel Scale (STS) and use disgruntlement are used as main methodologies for this study.

Figure 2 Theoretical framework



The survey questionnaire is divided into four sections: brief introduction; descriptive socio-demographic characteristics; journey experience and satisfaction with travel level. Firstly, the questionnaire starts with a brief introduction, including the purpose of the survey, the contents of each section, and approximate time to complete the whole questionnaire to inform and encourage engagement in the respondents. Next, questions regarding travel behavior are presented first to screen the respondents to select the commuters that travel between Shanghai and Suzhou regularly. Then the following questions intend to collect the socio-demographic characteristics of the respondents such as age, education and occupation level to build the profile of this particular group. By collecting this information, it provides more insight of the commuters and facilitate the analysis of the reasons of intercity commute. A set of questions concerning 'travel experience' and 'satisfaction with travel' are placed in the last section because personal questions such as feelings are not recommended at first (Krosnick et al., 2015).

The journey experience section is designed to exam the journey experience of HSR commuters by measuring individual self-reported experience, inspired by the methodology used by the Carreira et al. (2013) to measure journey experience of bus transportation. According to the previous research, the related attributes cover the instrumental and affective aspects of transport services such as accessibility and hardware and software qualities (Kuo and Tang, 2013; Hickman et al., 2015). After comparing and limiting the overlap attributes, a 12-item Scale is built, covering the most relevant factors influencing travel experience. Accessibility, waiting time and information provision are listed as instrumental factors along with nine other affective attributes include cleanliness, comfort, off-board service, on-board entertainment, safety, social environment, visibility of the scenery, staff's skills and productivity. The Scale intends to measure the different levels of passengers'

satisfaction with the transport services, using user disgruntlement approach from Stradling et al. (2007). The rationale of the user disgruntlement approach is to assess the difference between customer need and actual experience to highlight the area that requires improvement to deliver quality transportation service. Therefore, two sets of identical scales with different questions are produced; one starts with the question 'How important do you grant ...in your opinion' whilst the other asks 'What is your common experience when traveling by HSR...', using a 5 point scale where 1 is not important/ satisfied and 5 represents very important/ satisfied.

As the measurement of transport-related subjective well-being is limited, this paper uses the widespread measurement STS improved by Ettema et al. (2010) based on that developed by Bergstad et al. (2009). Newly-tailored STS does not only evaluate cognitive evaluation but also includes the affective aspect derived from the travel. The contents of STS have three parts (Table. 3), including positive/negative activation (PDNA), positive/negative deactivation (PAND) and cognitive evaluation (CE) with scores varied from -4 to 4, with -4 representing very time-pressed to 4 as very relaxed. However, owing to its simplicity, a five-point Likert Scale is widely used to increase response quality and response rate as well as reduce participants' 'frustration level' (Babakus and Mangold 1992; Dawes, 2008). Therefore, the Likert Scale here is used in STS evaluation with one being totally disagree and five being totally agree.

Table 3 Satisfaction with travel

Positive deactivation–negative activation
Time pressed-relaxed
Worried I would not be in time – confident I would be in time
Stressed – calm
Positive activation–negative deactivation
Tired - alert
Bored- enthusiastic
Fed-up - engaged
Cognitive evaluation
Travel was worst – best I can think of
Travel was low – high standard
Travel worked well – worked poorly

3.3 Survey

Firstly, a pilot survey was conducted among the author's colleagues and friends in order to test the validation of the questionnaire. One issue that existed in the questionnaire was raised, referring to the confusion that might be caused by two identical scales of the journey experience. Therefore, changes were made to emphasize the different purpose and the bold font was applied to the keywords of the questions 'important to you' and 'your experience.'

Next, combining a web-based survey and an on-the-spot survey, data was gathered to analyze the relationship between journey experience and well-being, using the inter-city HSR commuters as focus group. The questionnaire was created in both English and Chinese with Wenjuanxing survey software, which can be found in Appendix 1. The distribution of the questionnaire was through two channels. Firstly, the author searched keywords 'intercity commuters between Shanghai and Suzhou' on various Chinese social media such as Zhihu, QQ and Wechat. By contacting people who posted the relevant topic, the author managed to get into two Wechat groups with approximately four hundred Suzhou-Shanghai commuters. The link to the survey was posted in the group. Secondly, the QR code of the survey was distributed

in two HSR stations (Suzhou North Station and Suzhou SIP Station) of Suzhou during the rush hour of weekdays for two weeks. Face-to-face requests seem to have a higher response rate and higher quality, although it took more effort and time. The whole survey ran for almost four weeks, dated from the 10th of July to the 4th of August 2019.

On average, it took participants 3-4 minutes to complete the survey with satisfactory quality. Through Wenjuanxing survey software, random compensation ranging from 1 to 3 RMB was given to respondents after finishing the questionnaire and being verified as valid questionnaires by the author. To do that, each questionnaire was assessed by the author through two ways to assure the response is valid. Firstly, based on the average answering time (3 minutes), respondents who spent less than 100 seconds were marked as suspicious questionnaires and the author then scanned the answers. If the questionnaire was answered in a perfunctory way, which gave the same answer (agree or neutral) to all the questions, this questionnaire was marked as an invalid questionnaire.

3.4 Data Sampling

A total of 237 completed questionnaires were collected by Wenjuanxing, of which 168 were valid questionnaires after reviewing. The survey targeted the group of Suzhou-Shanghai commuters who regularly commute between the two cities using HSR.

According to Kruger and Casey (2014), respondents are chosen because they have specific common characteristics that relate to the research question. Therefore, it is necessary to ensure that the respondents have specific shared characteristics (Naoum, 2012). For this survey, the selected participants gave assurances that they

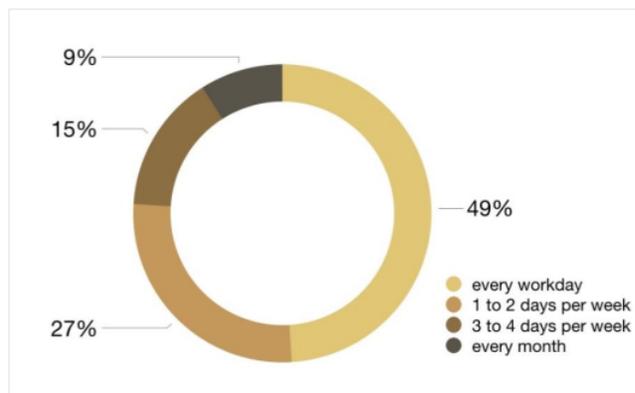
are commuters who regularly travel between Shanghai and Suzhou using HSR. Table. 4 delivers their personal information that assists in building their profiles. Among them, almost half commute every workday, while 27% of the total participants travel one or two days per week (Figure. 3). The percentage of commuters who travel for three to four days and every month is 15% and 9% respectively.

Table 4 Commuter's Profile

Participants	NO.	(%)
Female	43	26.22%
Male	121	73.78%
Age		
Below 18	1	0.61%
18 to 25	8	4.88%
26 to 30	74	45.12%
31 to 40	75	45.73%
41 to 50	4	2.44%
51 to 60	2	1.22%
Educational level		
Junior college	30	18.29%
Postgraduate	98	59.76%
Master	32	19.51%
PhD	2	1.22%

Income (RMB)	NO.	(%)
3,000 to 7,000	18	10.98%
7,000 to 12,000	36	21.95%
12,000 to 17,000	48	28.27%
17,000 to 22,000	23	14.02%
Above 22,000	39	23.78%
Occupation		
Company staff	84	51.22%
Company manager	27	16.46%
Professors	2	1.22%
Service industry	4	2.44%
IT	37	22.56%
Government officer	10	6.1%

Figure 3 Frequency of intercity commute



3.5 Data Preparation and Analysis

In order to conduct the data analysis, the collected data was exported from the survey software and imported into Excel and Statistical Package for Social Sciences (SPSS). Firstly, the data was organized in Excel to calculate the user disgruntlement score for both instrumental and affective factors of HSR (as per Stradling et al., 2007). Next, the mean scores of satisfaction with the travel were presented to indicate commuters' well-being. In addition, inspired by Ettame et al. (2012)'s study on STS and commuter's characteristics, regression analysis is adapted to assess the relationship between commuters' symptoms and well-being. Last, to answer the research question, the Pearson Correlation Coefficient analysis in SPSS software with instrumental and affective factors as independent variables were presented for nine STS dimensions. Pearson Correlation Coefficient analysis is one of the most popular methods to examine correlation, which delivers a method of testing the strength of the linear relationship between two variables. The coefficient is presented by a value from -1 to 1 . Pearson's method works well when there is a small sample (Sedgwick, 2012), which is also the main reason to use it for this research.

3.6 Ethics Statement

For this research, the ethical and moral concern is considered to be minimal. The participants of the survey took part voluntarily after being fully informed of the aim of the research and guaranteed that all the data will remain confidential. This was ensured by complete anonymity when participants fill out the questionnaire. Possible personal data involves age, education level and working status. However, it will not involve any sensitive personal data and all the data will be presented aggregated in the dissertation. Therefore, this research was considered to have complied with ethical considerations.

3.7 Limitation

The study involves several limitations regarding the data collection and analysis. In order to ensure a higher response rate, the design of the questionnaire was kept brief for the most relevant questions, especially for the service quality section. Many other aspects regarding commuters' characteristics and service quality attributes could be further explored. In addition, due to the small sample size, Pearson's correlation efficiency method is used in the research. However, one setback of this method is that the result of the linkage between journey experience and well-being might be influenced by confounding factors owing to the interrelated nature of variables in the social sciences (Kerlinger and Pedhazur, 1973). Moreover, when there is a small sample, it should be noticed that sample correlation might reflect the population correlation with a slight deviation (Chen and Popovich, 2002). Furthermore, compared to immediate approaches, retrospective approaches such as online surveys might result in memory bias (Kahneman et al., 1999), which can be improved by adapting semi-structured interviews in future research.

Chapter 4: Analysis and Discussion

4.1 User Journey Experience

User experience is measured by the expectation and actual experience of the transport service quality, including instrumental and affective factors of HSR.

As shown in figure 4, commuters give more importance to instrumental factors than affective factors with 'arriving punctually' scoring highest and 'chance to interact with other people' gaining the least attention. The outcome corroborates previous research, especially that conducted by Anable and Gaterslen (2005) who suggest that commuters assign more importance to convenience alongside speed and flexibility. Owing to travel purposes, travel time and punctuality play a vital role in evaluating transport service quality of work trips (Asensio & Matas, 2008). On the other hand, even though the average importance level of affective (3.817) is lower than the others (4.735), commuters still heed that certain affective factors such as 'quick safety check' along with 'use time productively' and 'able to sleep on the train' largely affect their journey experience.

Figure 4 Importance level of different factors

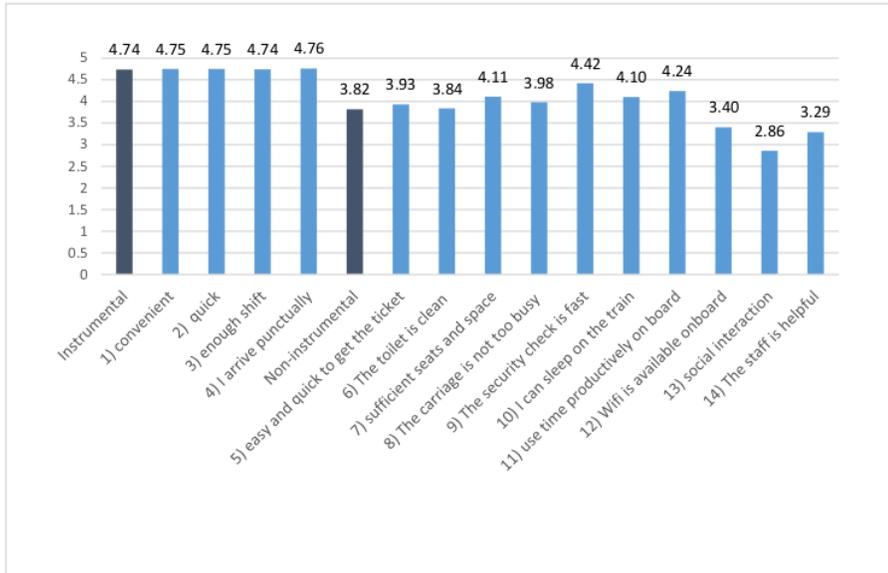
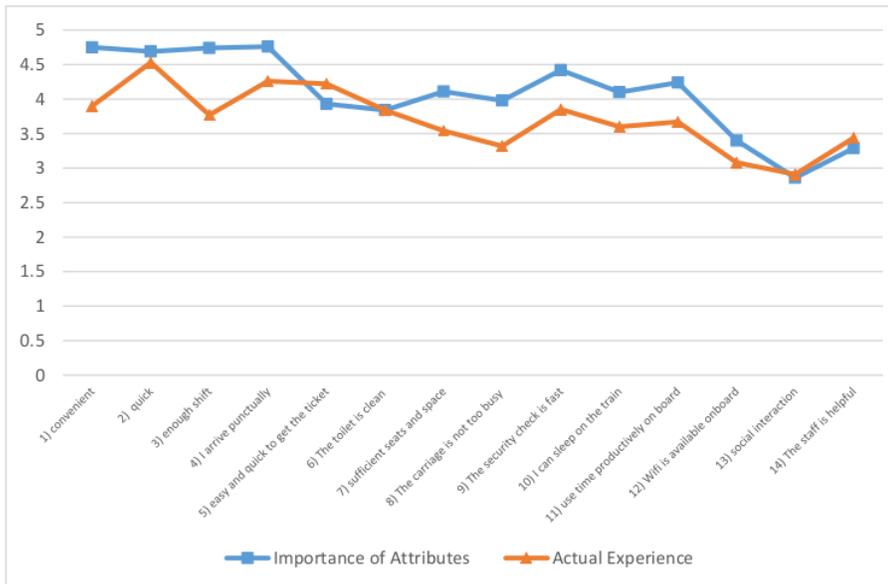


Figure 5 User disgruntlement of different factors



Next, user disgruntlement is used to underline the factors that are underperforming and need improvement. Calculating the mean of each attribute's score, the difference between expectation and actual journey concerning instrumental and

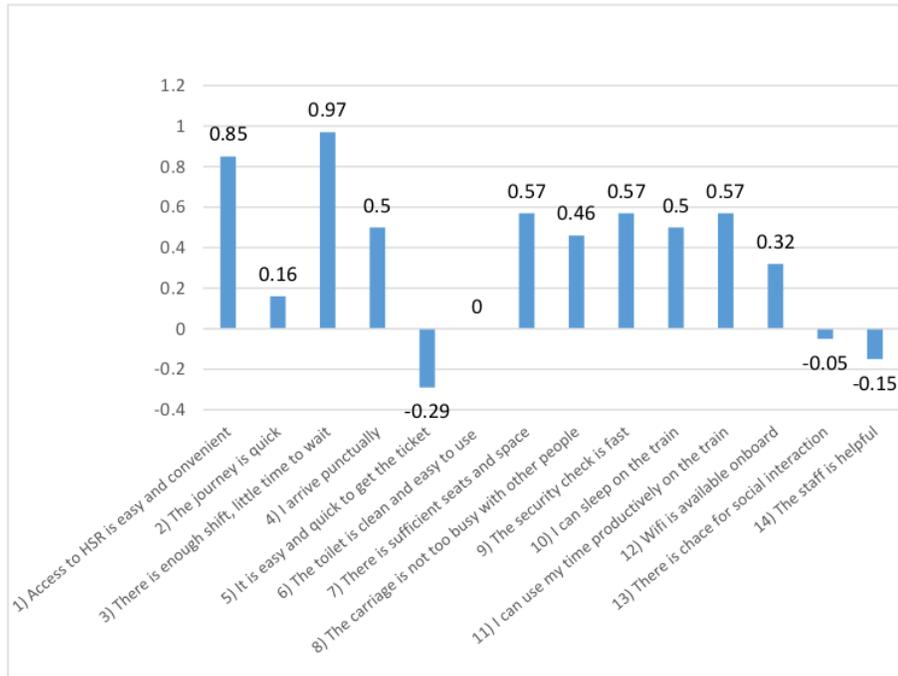
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affective factors can be visualized as a graphic profile (Figure. 5). Comparisons then can be made. Figure.6 shows the user disgruntlement directly by showing the difference between the scores, supported by the detailed data in Table. 5. The charts in Figure. 6 show the weakness and strengths of HSR to commuters and in which factors the greatest discrepancies lie. When the gap between importance and actual experience is above 0, it signifies that one is underperforming, reflecting a level of dissatisfaction, while when the figure is below 0 represents over-performing factors.

Table 5 User disgruntlement index

<i>Journey Experience</i>	<i>Importance</i>	<i>Actual Experience</i>	<i>User Disgruntlement</i>
<i>Instrumental factors</i>			
1) Access to HSR is easy and convenient	4.75	3.9	0.85
2) HSR is quick	4.75	4.53	0.16
3) There is enough shift	4.74	3.87	0.87
4) I arrive punctually	4.76	4.26	0.5
<i>Affective factors</i>			
5) It is easy quick to get the ticket	3.93	4.22	-0.29
6) The toilet is clean and easy to use	3.84	3.84	0
7) There is sufficient seats and space	4.11	3.54	0.57
8) The carriage is not too crowded	3.98	3.42	0.56
9) The security check is fast	4.42	3.85	0.57
10) I can sleep on the train	4.1	3.6	0.5
11) I can use my time productively	4.24	3.67	0.57
12) Wifi is available onboard	3.4	3.08	0.32
13) There is chance for social interaction	2.86	2.91	-0.05
14) The staff is helpful	3.29	3.44	-0.15

Figure 6 Scores of user disgruntlement



Shortened travel time on board is the most satisfying aspect of HSR in terms of instrumental attributes. As improved HSR speed is stated to play a fundamental role in evolving daily mobility patterns and fuel inter-city commuting (Sandow, 2008; Chen & Hall, 2011), it is a highly possible explanation for these commuters to choose HSR despite a high disgruntlement level of other instrumental factors. However, Givoni and Banister (2012) argue that speed is less crucial compared to door-to-door travel time. Within expectation, accessibility of HSR station, which is argued to be an essential component of the door-to-door journey, is given much importance. Zhen et al. (2018) support the argument by suggesting that a long journey to the station will offset the shortened travel time of HSR and decrease its attractiveness. With high demand, however, the poor accessibility level of HSR arouses negative feedback. The problem is usually caused by remotely located HSR stations. In China, unlike conventional railway stations, HSR stations are mostly located at urban fringes (Zhu

et al. 2015). Also, more pressure derives from the poor integration with other transportation modes which can be challenging for commuters without an automobile.

Given relatively high importance, not having enough shifts also indicates discontent. The issue is particularly severe in the morning based on observation and investigation. HSR in China enjoys a fixed shift every day unless events such as extreme weather occur. Although 20 shifts are running from Suzhou to Shanghai from 6:40 am to 9:14 am on weekdays, the fact is that tickets were usually sold out two days prior. 7 out of 20 trains provide standing-room-only tickets which probably alleviates the problem to some extent. Tickets for getting back to Suzhou from Shanghai in the evening are less sought-after, possibly due to the commuters enjoying more flexible time after work.

Contrary to the previous finding of Hickmam et al. (2015) that indicates a high level of user disgruntlement regarding the convenience to purchase a train ticket in Suzhou North Station, this study surprisingly found this factor well-performed and becomes the most satisfactory factor of all. One reasonable explanation is the improved ticket purchasing and check-in system facilitated by ICT. Since the 27th of July, 2019, six HSR stations in Suzhou started to conduct a non-ticket policy; passengers can check-in by using their ID or passport, which supposedly simplifies the boarding process. The other two factors which are over-performed include 'be able to have social interaction' and 'the staff is helpful'. However, this outcome may be explained by the fact that little importance is attached to them, especially social interaction, gaining the lowest importance level. On the other hand, the three least satisfying attributes among affective factors happen to have great significance to journey experience. All three have the same discontent score (0.57) however with

different important scores: the efficiency of security check (4.42); able to use time productively on board (4.24) and sufficient seat and space (4.11).

4.2 Well-being

HSR commuters' well-being is presented below using Satisfaction with Travel Scale. Mean scores are taken as the result of each component of well-being.

In general, the result shows that HSR commuters enjoy a positive deactivation that derives from the journey. The mean figure for feeling calm is 0.18, following by confident with a score of 0.07. Unsurprisingly, commuters feel time-pressed rather than relaxed, which is consistent with the 'rushed' feeling observed in long-distance commutes (Novaco and Gonzalez, 2009). However, a relatively high figure for negative deactivation shows that commuters commonly experience the feeling of being tired (-0.23), bored (-0.13) and fed up (-0.14) due to the use of HSR. Apparently, respondents consider HSR does its job with relatively high standards, however, less agrees travel that HSR is the best they can think of.

Table 6 Well-being score

Positive deactivation–negative activation	
Relax	-0.1
Confident	0.07
Calm	0.18
Positive activation–negative deactivation	
Alert	-0.23
Enthusiastic	-0.13
Engaged	-0.14
Cognitive evaluation	
Travel is the best i can think of	0.1
Travel was high standard	0.21
Travel worked poorly	-0.45

4.3 Investigating the Linkage between Journey Experience and Well-being

Table 7 Linear regression of commuters' characteristics and well-being

	Time pressed		Worried that I will be late		Stressed		Tired		Bored		Fed up		Travel is the worst I can think of		Travel works well	
	B	p	B	p	B	p	B	p	B	p	B	p	B	p	B	p
Male	-0.101	0.692	0.242	0.379	0.123	0.643	0.251	0.298	0.493	0.018*	0.619	0.003*	0.766	0.134	-0.07	0.433
Age	0.153	0.313	0.402	0.01*	0.264	0.096	0.229	0.112	0.397	0.001*	0.398	0.002*	0.494	0.561	0.006	0.946
Education Level	0.128	0.375	0.157	0.312	0.09	0.548	0.013	0.926	0.015	0.894	0.076	0.518	0.146	0.188	0.013	0.877
Income	0.072	0.426	0.025	0.796	0.002	0.981	0.038	0.659	0.02	0.781	0.074	0.319	0.125	0.073	0.133	0.161
Frequency of Commuting	0.17	0.040*	0.085	0.339	0.169	0.05*	0.182	0.020*	0.116	0.083	0.125	0.065	0.102	0.106	0.015	0.856

* $p < 0.05$ ** $p < 0.01$

Before examining the linkage between journey experiences, it is interesting to investigate the relationship between commuter's characteristics and well-being. Using regression analysis with nine STS aspects serving as dependent variables and commuters' characteristics (gender, age, educational level, income, frequency of commuting) acting as explanatory variables.

Firstly, it is noticed that age connects closely with negative activation and negative de-activation. This data support the conclusions of plenty of other research in this field, which links age with well-being (Graham, 2006). Convex U-shape is the most common phrase to describe the

relationship between age and well-being, indicating that mental stress peaks in middle age (Blanchflower and Oswald, 2008). This claim partly mirrors the explanation of the findings in this research. In this study, almost half of the respondents are aged between 31 to 40. Not only they are experiencing increasing mental stress, but also suffering from declining physical fitness (Blanchflower and Oswald, 2008). Therefore, regular long-distance travel no doubt brings more pressure on these middle-aged commuters.

Besides, frequency of commuting shows significant positive effect on time pressed ($p=0.040$), stressed ($p=0.049$) and tired ($p=0.020$). More frequent commutes can bring more negative emotions to commuters. This result is supported by Kahneman et al., (2004) and Wheatley (2013)'s study, which indicates that commute signifies one of the least appreciated activities during the day which generates dissatisfaction. This result is, however, contrary to prior research, which advises that the frequency of commute has a positive effect on positive de-activation. One explanation they offer is that the action of commuting as a freewill choice shows they are less resistant to commuting (Ettema et al., 2012). However, I would argue that the frequency of commute itself is not necessarily the worker's choice, but rather, the transportation mode is. Therefore, the result of Ettema et al. (2012) can probably be better explained by commuters having a higher evaluation of their travel mode choice and/or the range of possibilities they can choose from. When the study range is limited to one travel mode (such as HSR for this study), the finding can indicate that either the commute is not pleasant or the cognitive evaluation of the travel mode is low.

Pearson correlation coefficient analysis with instrumental and affective factors as independent variables are conducted in SPSS for nine STS scales divided into three dimensions (PDNA; PAND and CE). The result is used to answer the research question by evaluating the extent of journey experience affecting well-being.

Table 6 offers the result of the journey experience effects on well-being. A general observation suggests that all the instrumental factors act as significant players on the matter of well-being, which tends to act on all three dimensions of STS. Other than that, the subtler trend also requires an explanation. Firstly, amidst the four attributes, 'arriving punctually' is the only attribute that shapes journey experience in all three dimensions of STS with the most significant impact on negative de-activation following by negative activation and cognitive evaluation. In contrast, the speed of HSR leads to a positive appraisal of travel, making the speed of HSR stand out as the most vital contributor to positive cognitive evaluation. This makes sense as the improved speed provides an alternative for long-distance commuting in the first place (Garmendia et al., 2012), so it can be assumed that most commuters choose HSR as travel mode with its high speed in mind. Next, lack of shift and long waiting time provokes the strongest de-activation in a negative way such as tiring and boredom, followed by the accessibility of HSR station.

For affective factors, it is found that whereas the impact on well-being is limited to PAND dimension of STS, the valence and activation still fluctuate with service quality. Firstly, the result suggests that when there is less chance to use time productively onboard, passengers are more likely to feel fed up, bored and tired. The result mirrors the declaration of activities helping travelers' trips become more enjoyable and productive (Lyons et al., 2007). Although 'use my time productively on board' is one of the three ways to gain positive utility of travel time (Mokhtarian and

Salomon, 2001), no clear definition of 'productivity time on board' is provided and there will not be any due to the different need from this period. One example is 'able to sleep on the train', which is shown to act positively on the activation emotions such as being engaged. Some of the on-board activities may even appear to be 'anti-activity' such as be able to relax and think, mentally 'shifting gears' between origin and destination roles and activities, or even enjoy the speed, absorb the environment such as the scenic beauty and social interaction ((Mokhtarian and Salomon, 2001). Lack of such physical environment may force commuters to 'kill time', which closely links to 'being bored' (Lyons and Urry, 2005).

Second, having sufficient seats and space appears to give rise to positive activation emotions. In other words, insufficient seats and space will cause the emotions of fed up, bored and tiring. One can argue the potential explanation is that passengers not being seated can influence their ability to use time productively, especially for entertainment activities, and in turn cause insufficient relaxation (Line et al., 2011; Ettema et al., 2012). Following the same logic, the other similar attributor 'crowdedness' should indicate the same effect, which shows no significant correlation with well-being. This somewhat contradictory outcome might be partly explained by improved Information and Communication Technologies such as smartphones, which provide the capacity to amuse people even if the carriage is packed (Lyons and Urry, 2005). Therefore, a more plausible explanation of the great impact of not having sufficient seats is suggested. The available tickets are limited to the seat number except that some shifts offer standing-room-only tickets. One direct consequence of not having sufficient seats is that workers cannot get the ticket, go through the automatic ticket gates and miss the work. Thus, not having sufficient seats is assumed to have little impact during the journey but causes the feeling of negative de-activation emotions before the journey.

Finally, two affective factors, which relate to the efficiency of boarding service, are illustrated correlated with well-being. Fast security check has a negative impact on the level of boredom (-0.206) while getting a ticket fast helps to ease the stress of the commuters.

4.4 Discussion

4.4.1 Journey Experience

Prior studies have noted the importance of affective factors in journey experience and disgruntlement in order to increase the service quality of public transportation (Stradling et al., 2007; Carreira et al., 2013; Hickman et al., 2015). This study sets out with the objective of evaluating HSR journey experience and transport-related well-being, filling the gap of the door-to-door intercity travel experience of this topic. A comparison of the findings with those of other studies confirms the leading position of instrumental factors in commuting journey experience (Anable and Gatersleben, 2005; Zhen et al., 2018). Moreover, the significance of affective factors to journey experience also can be observed from the results. The results corroborate the idea of improving service quality in the interchange of HSR such as fast security checks (Hickman et al., 2015), alongside the demand for in-vehicle activities suggested by Ettema (2012). The results of the disgruntlement add on to the practical utility of the experience theory by specifying the aspects that need improvement. In general, the user disgruntlement underlines the need for increased capacity during the morning rush hour, improved efficiency of service in HSR hub and suitable on-board environment for in-vehicle activities.

4.4.2 Linking Journey Experience and Well-being

The research question sought to determine the extent of how journey experience affects well-being, which is a relatively newly discovered topic.

According to the data, instrumental factors-‘I arrive punctually’ and ‘have enough shift’ obtain the highest disgruntlement (Figure. 6), which interestingly also indicates to have a significant influence on commuter’s well-being (Table. 8). This phenomenon suggests that with higher disgruntlement, the key factors are the ones

that play a vital role in influencing well-being. Affective factors show the same trend with 'have enough seats', 'security check is fast' and 'I can use my time productively', which are evaluated as profoundly important as well as underperforming factors.

Generally, the impact of instrumental factors on well-being appears to override affective factors. In fact, it is not contradictory to the previous research which claims that more attention should be paid to the affective aspect. This inconsistency is due to the lack of the comparison of instrumental and affective factors regarding well-being issues in previous studies (Carreira et al., 2013; Hickman et al., 2015). Also, the travel purpose might be part of the explanation. Commuters tend to attach more importance to instrumental factors when traveling because they feel more stressed and unrelaxed about being punctual for work. (Anable and Gatersleben, 2005).

The quantitative analyse assures the linkage between journey experience and well-being in the context of HSR in China, opening up a new topic for future research in the field. The next section will provide insight critics for policy development regarding HSR in China by pointing out the specific dimension that needs improvement and provide suggestions on such issues.

4.5 Policy Implications

In the prolongation, the results indicate several possible policy implications of HSR in China. With well-being as the ultimate goal for transportation planning (Stanley and Stanley,2007), improving journey experience should be seen as an essential step forward. With HSR soaring in China, most attention is paid to improving the instrumental experience. However, as literature argues, affective factors also play crucial roles in determining journey experience. By reviewing the factors that have an impact on well-being, while brief and basic, this research can still lead to

suggestions about where to enhance service quality. In general, they can be divided into four aspects: operation; transport system integration (hardware and software); personnel allocation and hardware on-board.

Comparing and summarizing both instrumental and affective factors, their performance and impact on well-being, there are four major problems with great importance but poor performance existing in the HSR system:

- Not having enough shift/seat/space in the morning rush hour
- Having difficulty in accessing HSR station
- The security check is slow
- Having difficulty in using time productively on the train

To solve the problem of 'not having enough shift/ seat/space', a reasonable approach could be adding extra carriages and temporary trains, which is used annually to facilitate the world's largest human migration during Chinese New Year. However, the biggest challenge of this solution is the indefinite result of cost-benefit analysis due to the fluctuating passenger volume over the weekdays. According to the result (Table.4), half of the commuters travel regularly but not daily. This increases uncertainty with predicting ridership and then justifying adding extra carriages. Taking a step back, a more straightforward solution might be increasing standing-room-only tickets in the morning rush hour. However, this requires extra caution to quantify the extra tickets to avoid overcrowded on-board.

Secondly, Susilo and Cats (2014) argue that access satisfaction enjoys a marginal effect on overall journey experience. Thus, it is critical to integrate the HSR system with the urban transportation system. The solution can be discussed from two

dimensions, including both hardware and software. Ways to integrate HSR with urban transportation varies due to cities' unique transportation development trajectories. For example, with cities that enjoy a relatively developed metro system such as Beijing, the metro might be the main target to be integrated into the HSR system. However, for cities which do not currently have a complete metro system, such as Suzhou, enhancing the connection with buses and improving facilities such as car parking could be the first step (Zhen et al. 2018). In addition, to offer transit options, information about the whole transportation system, which covers other travel means and their routes and should be provided by China Railway Information Technology Centre.

Flexible and suitable personnel allocation should be the norm to facilitate the unforeseen circumstances to maintain the efficiency of the HSR service. Especially during the morning peak hour, it is important to have enough staff and channels for security checks in case there is congestion and queueing.

Finally, it should be established that it is challenging to define what is the suitable ambiance for commuters to use their time productively on-board. Different on-board activities may have a different requirement. For example, to sleep on the train requires a seat and a quiet background. Therefore, adjusting and designing the on-board environment needs more investigation of commuter's preferred in-vehicle activities.

With the soaring figure of intercity commuters, these suggestions are also applicable to HSR in other Yangtze River Delta cities. Not only that, the national policy focus and evaluation criteria of HSR should gradually shift from cost-benefit analysis to well-being analysis.

Chapter 5 Conclusion

The achievement of HSR in improving sustainable transportation is contingent on its impact on not only speed and efficiency, but also well-being. This study aims to investigate to what extent the journey experience of HSR influences the well-being of intercity commuters. A model was proposed, using data from intercity HSR commuters' travel between Suzhou and Shanghai. Results of user journey experience and well-being are obtained and used to answer the research question of this study.

Research Objectives:

- Why are there long-distance intercity commuters in the Yangtze River Delta?

From reviewing literature, there are three main reasons that can explain the phenomenon happening in the Yangtze River Delta, including economy and spatial integration, improvement in HSR technology and salary and living cost mismatch.

Metropolitan integration has been a prominent national strategy in China to reinforce the regional capital and regional competitiveness, causing greater division of labor within the region. However, one of the biggest problems migrants are facing is the mismatch of housing cost and earning. Luckily, supported by the improved speed, HSR increases the pulling force of the bigger cities such as Shanghai by providing migrant labour with a solution to avoid the high living cost in big cities – the intercity commute.

- What is the journey experience and expectation of Suzhou-Shanghai commuters by examining relative instrumental and affective factors?

The main findings suggest that instrumental factors enjoy greater importance than that of affective factors, supporting evidence from prior observations with

punctuality and enough shifts as critical indicators (Strading et al., 2007). However, this might also lead to a generally high level of user disgruntlement among instrumental factors except

The research question sought to determine the extent that journey experience affects well-being by using the Pearson correlation coefficient method. General observation advocates that all the instrumental factors act as significant players on the matter of well-being, whose influence covers all the aspect of STS whilst affective factors only bring impact on the deactivation emotion. The result is valuable for identifying crucial service determinants of journey experience and well-being.

In addition, though not related to service quality of HSR, it is worth pointing out that commuter's characteristics, age and the frequency of commuting are shown to be associated with satisfaction with travel. The fact that the frequency of commuting brings the emotion that is more negative re-ensures and justifies the need to investigate commuter's well-being. Therefore, further study could look into the commuters' profiles and specify their needs in order to improve the service.

This research fills the gap of intercity HSR commuter's journey experience and the impact on their well-being. The contribution is valuable since the intercity commute by HSR is soaring worldwide. The result specifies the attributes that influence the journey experience and well-being of HSR, providing guidance for further improvement of HSR service quality. In order to achieve the goal of sustainable transportation, further research and policy-making should also shift its attention gradually from the instrumental benefits of transportation to journey experience and well-being for public transportation.

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[Appendix 1: Questionnaire](#)

Dear Sir or Madam:

This is a survey to investigate your satisfaction with HSR and well-being. The questionnaire has three sections: general details; journey experience and satisfaction with travel evaluation. It will approximately take three to four minutes to complete the questionnaire.

Section 1: General Details

What is your travel purpose?	Work	Study	Leisure Travel	Visiting friends	- _____
How are are you?	18-29	30-49	50-65	65+	
What is your gender?	Female	Male			
Education level	vocational school	undergraduate	postgraduate	PhD	
Income level	3,000-7,000 RMB/month	7000-12,000 RMB/month	12,000-17,000 RMB/month	17,000-22,000 RMB/month	Above 22,000 RMB/month
Frequency of using HSR	Every working day	3-4 times per week	1-2 times per week	Every month	Other _____ -
Additional Comments:					

Section 2: Journey Experience

(a) When you are commuting by HSR, it is important that..

	Not important	Of little importance	Of average importance	Very important	Absolutely crucial
1) Access to HSR is easy and convenient					
2) The journey is quick					
3) There is little time to wait					
4) I arrive punctually					
5) It is easy and quick to get the ticket					
6) The toilet is clean and easy to use					
7) The carriage is comfortable with sufficient seats and plenty of space					
8) The carriage is not too busy with other people					
9) The security check is fast					
10) I can sleep on the train					
11) I can use my time productively on the train					
12) Wifi is available onboard					
13) There is some opportunities for social interaction					
14) The staff is helpful					
Additional Comments:					

(b) What is your real journey experience?

	Not important	Of little importance	Of average importance	Very important	Absolutely crucial
1) Access to HSR is easy and convenient					
2) The journey is quick					
3) There is little time to wait					
4) I arrive punctually					
5) It is easy and quick to get the ticket					
6) The toilet is clean and easy to use					
7) The carriage is comfortable with sufficient seats and plenty of space					
8) The carriage is not too busy with other people					
9) The security check is fast					
10) I can sleep on the train					
11) I can use my time productively on the train					
12) Wifi is available onboard					
13) There is some opportunities for social interaction					
14) The staff is helpful					
Additional Comments:					

Section 3: How satisfied are you with your travel?

	Very	Moderate	Neutral	Moderate	Very	
I was time pressed						I was relaxed
I was worried I would not be on time						I was confident I would be on time
Stressed						calm
Tired						alert
Bored						enthusiastic
Fed up						engaged
Travel was worst						best I can think of
Travel was low						high standard
Travel worked well						worked poorly

Appendix 2: Approval of the Risk Assessment

RISK ASSESSMENT FORM

FIELD / LOCATION WORK

The Approved Code of Practice - Management of Fieldwork should be referred to when completing this form

<http://www.ucl.ac.uk/estates/safetynet/guidance/fieldwork/acop.pdf>

DEPARTMENT/SECTION MSC TRANSPORT AND CITY PLANNING ASSIGNMENT

LOCATION(S) SUZHOU, CHINA

PERSONS COVERED BY THE RISK ASSESSMENT student

BRIEF DESCRIPTION OF FIELDWORK surveys and interviews in high speed railway station

Consider, in turn, each hazard (white on black). If **NO** hazard exists select **NO** and move to next hazard section.

If a hazard does exist select **YES** and assess the risks that could arise from that hazard in the risk assessment box.

Where risks are identified that are not adequately controlled they must be brought to the attention of your Departmental Management who should put temporary control measures in place or stop the work. Detail such risks in the final section.

ENVIRONMENT

The environment always represents a safety hazard. Use space below to identify and assess any risks associated with this hazard

e.g. location, climate, terrain, neighbourhood, in outside organizations, pollution, animals.

Examples of risk: adverse weather, illness, hypothermia, assault, getting lost.

Is the risk high / medium / low ?

As researcher is living there for four years and is very familiar with the environment, the risk will be low.

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

work abroad incorporates Foreign Office advice

- participants have been trained and given all necessary information
- only accredited centres are used for rural field work
- participants will wear appropriate clothing and footwear for the specified environment
- trained leaders accompany the trip
- refuge is available
- work in outside organisations is subject to their having satisfactory H&S procedures in place
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

EMERGENCIES

Where emergencies may arise use space below to identify and assess any risks

e.g. fire, accidents

Examples of risk: loss of property, loss of life

As the survey will be conducted in researchers' home town, the risk of accident will be low.

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- participants have registered with LOCATE at <http://www.fco.gov.uk/en/travel-and-living-abroad/>
- fire fighting equipment is carried on the trip and participants know how to use it
- contact numbers for emergency services are known to all participants
- participants have means of contacting emergency services
- participants have been trained and given all necessary information
- a plan for rescue has been formulated, all parties understand the procedure
- the plan for rescue /emergency has a reciprocal element
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

EQUIPMENTIs equipment
used?If 'No' move to next hazard
If 'Yes' use space below to identify and
assess any
risks*e.g. clothing, outboard
motors.*Examples of risk: inappropriate, failure, insufficient training to use or repair,
injury. Is the risk high / medium / low ?

Equipment such as smartphones will be used. However, the related-risk will be low

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- the departmental written Arrangement for equipment is followed
- participants have been provided with any necessary equipment appropriate for the work
- all equipment has been inspected, before issue, by a competent person
- all users have been advised of correct use
- special equipment is only issued to persons trained in its use by a competent person
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

LONE WORKINGIs lone working
a possibility?If 'No' move to next hazard
If 'Yes' use space below to identify and
assess any
risks*e.g. alone or in isolation
lone interviews.*Examples of risk: difficult to summon help. Is the risk high / medium /
low?

All the lone work will be done in the public space: train station. So that the risk will be low.

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- the departmental written Arrangement for lone/out of hours working for field work is followed
- lone or isolated working is not allowed
- location, route and expected time of return of lone workers is logged daily before work commences
- all workers have the means of raising an alarm in the event of an emergency, e.g. phone, flare, whistle
- all workers are fully familiar with emergency procedures
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

FIELDWORK

2

May 2010

ILL HEALTH

The possibility of ill health always represents a safety hazard. Use space below to identify and assess any risks associated with this Hazard.

e.g. accident, illness, personal attack, special personal considerations or vulnerabilities.

Examples of risk: injury, asthma, allergies. Is the risk high / medium / low?

LOW

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- an appropriate number of trained first-aiders and first aid kits are present on the field trip
- all participants have had the necessary inoculations/ carry appropriate prophylactics
- participants have been advised of the physical demands of the trip and are deemed to be physically suited
- participants have been adequate advice on harmful plants, animals and substances they may encounter
- participants who require medication have advised the leader of this and carry sufficient medication for their needs
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

TRANSPORT	Will transport be required	NO		Move to next hazard
		YES		Use space below to identify and assess any risks

e.g. hired vehicles

Examples of risk: accidents arising from lack of maintenance, suitability or training

Is the risk high / medium / low?
low

CONTROL MEASURES Indicate which procedures are in place to control the identified risk

- only public transport will be used
- the vehicle will be hired from a reputable supplier
- transport must be properly maintained in compliance with relevant national regulations
- drivers comply with UCL Policy on Drivers http://www.ucl.ac.uk/hr/docs/college_drivers.php
- drivers have been trained and hold the appropriate licence
- there will be more than one driver to prevent driver/operator fatigue, and there will be adequate rest periods
- sufficient spare parts carried to meet foreseeable emergencies
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

DEALING WITH THE PUBLIC	Will people be dealing with public		If 'No' move to next hazard
			If 'Yes' use space below to identify and assess any risks

e.g. interviews, observing

Examples of risk: personal attack, causing offence, being misinterpreted. Is the risk high / medium / low?
LOW

CONTROL MEASURES Indicate which procedures are in place to control the identified risk

- all participants are trained in interviewing techniques
- interviews are contracted out to a third party
- advice and support from local groups has been sought
- participants do not wear clothes that might cause offence or attract unwanted attention

<input checked="" type="checkbox"/>
<input type="checkbox"/>

interviews are conducted at neutral locations or where neither party could be at risk

OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

FIELDWORK

3

May 2010

WORKING ON OR**NEAR WATER**

Will people work on or near water?

If 'No' move to next hazard

If 'Yes' use space below to identify and assess any risks

e.g. rivers, marshland, sea.

Examples of risk: drowning, malaria, hepatitis A, parasites. Is the risk high / medium / low?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- lone working on or near water will not be allowed
- coastguard information is understood; all work takes place outside those times when tides could prove a threat
- all participants are competent swimmers
- participants always wear adequate protective equipment, e.g. buoyancy aids, wellingtons
- boat is operated by a competent person
- all boats are equipped with an alternative means of propulsion e.g. oars
- participants have received any appropriate inoculations
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

MANUAL HANDLING (MH)

Do MH activities take place?

NO

If 'No' move to next hazard

If 'Yes' use space below to identify and assess any risks

e.g. lifting, carrying, moving large or heavy equipment, physical unsuitability for the task.

Examples of risk: strain, cuts, broken bones. Is the risk high / medium / low?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- the departmental written Arrangement for MH is followed

- the supervisor has attended a MH risk assessment course
- all tasks are within reasonable limits, persons physically unsuited to the MH task are prohibited from such activities
- all persons performing MH tasks are adequately trained
- equipment components will be assembled on site
- any MH task outside the competence of staff will be done by contractors
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

SUBSTANCES	Will participants work with substances	NO	If 'No' move to next hazard If 'Yes' use space below to identify and assess any risks
<i>e.g. plants, chemical, biohazard, waste</i>	Examples of risk: ill health - poisoning, infection, illness, burns, cuts. Is the risk high / medium / low?		

CONTROL MEASURES Indicate which procedures are in place to control the identified risk

- the departmental written Arrangements for dealing with hazardous substances and waste are followed
- all participants are given information, training and protective equipment for hazardous substances they may encounter
- participants who have allergies have advised the leader of this and carry sufficient medication for their needs
- waste is disposed of in a responsible manner
- suitable containers are provided for hazardous waste
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

OTHER HAZARDS	Have you identified any other hazards?	NO	If 'No' move to next section If 'Yes' use space below to identify and assess any risks
----------------------	--	-----------	---

i.e. any other hazards must be noted and assessed here. Hazard: _____
Risk: is the risk _____

CONTROL MEASURES Give details of control measures in place to control the identified risks

Have you identified any risks that are not adequately controlled?	NO <input checked="" type="checkbox"/>	YES <input type="checkbox"/>	Move to Declaration Use space below to identify the risk and what action was taken
---	---	-------------------------------------	---

Is this project subject to the UCL requirements on the ethics of Non-NHS Human Research?

If yes, please state your Project ID Number

For more information, please refer to: <http://ethics.grad.ucl.ac.uk/>

DECLARATION

The work will be reassessed whenever there is a significant change and at least annually. Those participating in the work have read the assessment.

Select the appropriate statement:

- I the undersigned have assessed the activity and associated risks and declare that there is no significant residual risk
- I the undersigned have assessed the activity and associated risks and declare that the risk will be controlled by the method(s) listed above

NAME OF SUPERVISOR Marco Dean

**** SUPERVISOR APPROVAL TO BE CONFIRMED VIA E-MAIL ****

FIELDWORK

5

May 2010

Re: risk assessment _xingyuan fu

Dean, Marco

周三 2019/5/15 13:47

收件人: Fu, Xingyuan <xingyuan.fu.18@ucl.ac.uk>

Dear Xingyuan,

This email is to confirm that your Risk Assessment form has been approved. Please include this email as appendix of your dissertation and bear in mind that besides physical risks and control measures, you are also required to comply with specific research ethics requirements and procedures.

Kind Regards

Dr. Marco Dean

BSP, UCL

From: Fu, Xingyuan

Sent: 14 May 2019 15:49:32

To: Dean, Marco

Subject: risk assessment _xingyuan fu

Hi Marco,

The risk assessment is attached below.

Best,
Xingyuan.