

# **DOES FAMILY BACKGROUND IMPACT DRIVING ATTITUDES AND RISKY BEHAVIOURS? – AN INVESTIGATION ON CHINESE YOUNG DRIVERS**

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# Abstract

As the biggest developing country in the world, China has been conducting road safety research and management work for many years. However, some recent horrible road crashes involving young drivers reported by mass media still drew people's attention because many of these young drivers share a common feature: SRPG (Second Rich and Powerful Generation), that is, they have a financially rich and politically powerful family background. It is worthwhile to investigate if relationships exist between Chinese young drivers' road safety performance and their economic and political backgrounds. Meanwhile, additional factors including culture, personality and demographics were also studied in this research to assist understanding of the key factors.

This study applied self-developed scales to measure economic and political background status as well as a range of culture, personality and demographic scales developed by other researchers. An online survey was conducted by a Chinese survey company SOJUMP in May 2015. A total of 476 Chinese young drivers aged between 18 and 28 completed the online survey, including 305 males and 171 females. There were 156 respondents who indicated that they had a political background (family member or close relatives with a political standing).

The survey data have been analysed using various statistical techniques, including correlation analysis, ANOVA, hierarchical regression analysis, and structural equation modelling (SEM). The results suggested that for participants with political background, more risky driving behaviours were reported among those participants who reported more impact on their life from political background; while for participants without political background, higher personal income was associated with more risky driving behaviours. Findings of other factors are also discussed in this thesis. The current research fills an important research gap - no road safety research has taken political background status into consideration as potential factors that influence driving attitudes and behaviours. Relevant policies could be

formulated accordingly in order to educate target population to reduce Chinese young novice drivers' involving in road crashes.

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# Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

QUT Verified Signature

Signature:

Date:

04/03/2016

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# Chapter 1: Introduction

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The road crash is an important public health issue, one that has been increasingly recognised by governments and institutions internationally. On 10 April 2014, the United Nations (UN) General Assembly adopted a resolution of the “Decade of Action for Road Safety 2011-2020”, which aims to reduce the number of fatalities on the world’s roads. Many governments have promised that new policies and projects will be implemented in order to improve road safety and health services for road crash victims [1]. Numerous studies have been conducted to investigate causes and consequences of road crashes [2] [3], and research into factors related to drivers has been continuously developed [4] [5]. It has been reported that driving behaviours and attitudes have connections with drivers’ social and economic demographics, such as age, gender, income, education level and religion [6]. Additionally, personality traits have also been studied to analyse the causes of diverse driving behaviours and road crashes [7] [8].

Scholars have been conducting cross-country comparative research to reveal the underlying reasons for road crashes, which are mainly related to cultural, social and legislative influences [9], for certain driving behaviours and attitudes [10] [11]. It has been concluded by some researchers that cultural factors do not show a significant impact on drivers’ risk perception [12], and there is no statistically significant difference in self-reported driving skills and safety perceptions at a country level [11]. However, the countries involved in these studies are all developed countries, most of which are located in Europe (e.g., Sweden, Greece and Russia). The case can be quite different in developing countries. Researchers have found that the differences in evaluation of driving attitudes, risk perception and behaviours are significant between respondents from Norway and Ghana (a low-income country located in West Africa) [13]. Respondents from India, Sub-Saharan Africa and Near East countries (most of which are developing countries, e.g., Turkey and Iran) also reported overall more dangerous attitudes towards traffic safety and driver behaviour than Norwegian participants [3]. A comparison study revealed that Iranian drivers were more likely to conduct rule violations and speeding, and were less likely to use

seat belts than Turkish drivers. In addition, the Iranian respondents estimated a lower possibility and also less severe health consequences of being involved in a road crash than their Turkish counterparts [10]. Differences of drivers' road safety performance actually existed in different countries with different cultural, political backgrounds and economic development levels.

## **1.1 Research background**

In China, annual road crashes have increased from approximately 6,000 in 1951 to 413,000 in 1999; meanwhile, the annual injuries caused by road safety issues had increased from approximately 5,000 to 286,000 in the same time period, and annual fatalities had increased from 852 to approximately 84,000 as well [14]. Nearly 100,000 people were killed on the road each year from 2001 to 2007 in China [15], equivalent to about 274 fatalities per day. According to the Global Status Report on Road Safety, 65,225 people in China were killed in road crashes in 2013 [16]. Horrifying road crashes in China are frequently reported by the news media.

China has the fastest growing economy in the world during the past 30 years with an average annual GDP growth rate above 10% [17]. As a result, the average incomes of many Chinese families have increased remarkably, which has allowed many to afford to buy cars for their children and themselves for the first time [18]. In turn, the number of road crashes involving young drivers is continuously increasing [19], some of which have resulted in severe consequences such as fatalities and serious injuries. A recent study conducted in the United Kingdom (UK) has found that young drivers are at risk more often because they fail to anticipate the potential consequences of their risky actions [20]. They tend to underestimate the complexity of the driving task and overestimate their driving capabilities, which results in the driver having a smaller safety margin than they believe [21]. Meanwhile, a wealth of evidence from novice driver research conducted in many countries indicates that, due to a lack of driving experience, the crash risk is greatest during the first year of independent driving [22]. Misjudging the speed of oncoming vehicles, violations of licensing passenger restrictions, fatigue-driving, driving in a bad mood and active punishment avoidance are all common behaviours of concern for adolescent drivers

[23] [24]. In addition, as a prevailing habit among young drivers, phone use while driving, including texting while driving, has been shown to lead to a significant increase of the reaction time due to driver distraction and delayed reaction at the moment of the incident [25]. The family's safety atmosphere is also closely associated with the crash rate of young drivers. For instance, it has been demonstrated that a higher perception of parents not being committed to safety and lower perceived parental monitoring are related to a higher risky driving events rate among young drivers in Israel [26]. While the body of evidence about the risks associated with novice drivers is substantial, very little research has been conducted in China.

“Second Rich and Powerful Generation” (SRPG) is a novel Chinese term, which is defined as young men or women who have grown up with an economically rich and/or politically powerful family background [27] [28]. In recent years, emerging issues on the road involving SRPG drivers have become a serious social problem in China, which has caused severe consequences, such as fatalities and serious injuries. Two typical and widely-reported road crashes involving SRPG drivers in China drew a large amount of public attention. On October 16 2010, after a luxury car crashed into two college students on a campus because of speeding and drink-driving, one student died later in hospital and one was critically injured. The young driver, who was only 22-years old, was reported to have shouted to students who stopped his car, “do whatever you want, no harm to me because my father is xxx (a deputy director of the local public security bureau)” [29]. On October 20 2010, a college student from a rich family crashed into a woman and then stabbed her to death when he found that she was recording his car license plate number [30]. As the number of similar incidents is far more than these two cases [31], it is important to examine ways to help diminish road crashes and related harm involving SRPG drivers. Media reports of such road crashes always emphasize the economic or political backgrounds of SRPG drivers, which are the most significant features that distinguish them from general drivers. However, no road safety research has investigated the family backgrounds (both economic and political) of drivers as key factors related to driving. As a consequence, the initial motivation of this study was formed, which aimed to investigate the potential relationships between Chinese young drivers’

economic and political backgrounds, and their self-reported driving attitudes and risky driving behaviours.

## **1.2 Research gap**

Currently, very little research has investigated the potential relationship between drivers' economic and political backgrounds and their driving attitudes and behaviours. One reason might be that these factors do not play a big role for drivers in developed countries, where much of the road safety related research has been conducted. However, the case in developing countries can be different from developed countries, especially in countries with long traditions and deep-rooted values like China. Additionally, China has different political structure/system from many other countries, which possibly makes unique political influences on Chinese drivers. As numerous road crashes involving SRPG drivers have been documented in the Chinese media, the need to understand the underlying reasons for their unique driving behaviours and attitudes is exigent. Also, based on emerging issues on the road involving SRPG drivers, it seems that Chinese novice drivers may be more easily influenced by external factors than experienced drivers because of their immaturity and limited driving experience. Therefore, to fill this research gap and further improve road safety in China, it is necessary to conduct research that targets Chinese young drivers as the research population in order to detect potential relationships between their economic and political backgrounds, and their unique driving attitudes and behaviours. Additionally, culture, personality and demographic factors are taken into consideration because they also have potential impact on driving behaviours and attitudes according to relevant literature.

## **1.3 Research hypotheses**

The aim of this research is to investigate whether the economic and political background of Chinese young drivers significantly impacts their driving attitudes and risky driving behaviours. As has been shown from previous attitudinal/behavioural research in social psychology [32], the link between attitudes and behaviours is strong. Another crucial factor grouping participants in this study is whether the participant has parents/close relatives who hold political power. Considering recent



road crashes involving “SRPG” drivers in China, the current research is grounded by the assumption that participants with political background may report more dangerous driving behaviours than participants without political background.

To accurately detect such relationships, 15 hypotheses were developed including the key factors and common demographic factors that were examined in this study. They were split into three sections based on whether it was identified for participants whose parents/close relatives hold political power or not, and for all participants. Section 1.3.1 states the hypotheses for all participants in general, and other hypotheses are developed in the following two sections to examine the differences between the two groups of participants with and without political background.

### **1.3.1 Hypotheses for all participants in general**

*H<sub>1</sub>: Safer driving attitudes will be associated with less risky self-reported driving behaviours.*

*H<sub>2</sub>: Participants who report a political background will report more dangerous driving attitudes than participants who do not report a political background.*

*H<sub>3</sub>: Younger participants will report more risky driving behaviours than older participants.*

*H<sub>4</sub>: Male participants will report more risky driving behaviours than female participants.*

*H<sub>5</sub>: Less driving experience will be associated with more self-reported risky driving behaviours.*

*H<sub>6</sub>: Lower levels of education will be associated with more self-reported risky driving behaviours.*

*H<sub>7</sub>: Place of residence (i.e., level of city based on population level) will be associated with self-reported risky driving, such that participants from smaller cities will report more risky driving behaviours.*

*H<sub>8</sub>: The relationship between driving attitudes and risky behaviours will be mediated by culture.*

### **1.3.2 Hypotheses for participants whose parents/close relatives hold political power**

*H<sub>9</sub>: For participants with political background, higher personal income will be associated with more risky driving behaviours.*

*H<sub>10</sub>: For participants with political background, higher parental income will be associated with more risky driving behaviours.*

*H<sub>11</sub>: The level of political position held by participants' parents/close relatives will influence risky driving behaviours, such that those who report a higher administrative position will also report more risky driving.*

*H<sub>12</sub>: More risky driving behaviours will be reported among those participants who report more impact in their life from political background.*

*H<sub>13</sub>: More risky driving behaviours will be reported by participants who have benefitted more often from their family political background than those who have benefitted less often.*

### **1.3.3 Hypotheses for participants whose parents/close relatives do not hold political power**

*H<sub>14</sub>: For participants without political background, higher personal income will be associated with more risky driving behaviours.*

*H<sub>15</sub>: For participants without political background, higher parental income will be associated with more risky driving behaviours.*

## **1.4 Research significance**

This research aims to fill a gap in our knowledge regarding the role of a range of human factors, including economic, political and cultural factors, in road crashes, such that new policies could be developed in order to diminish road crashes involving Chinese young drivers. Three main contributions of this study are: i) a well-designed survey for collecting data to understand Chinese young drivers' driving attitudes and behaviours; ii) a dataset containing necessary information for

researchers to study many factors' impact on Chinese young drivers' attitudes and behaviours; and iii) the investigation of impacts on drivers' attitudes and behaviours from their family backgrounds (both economic and political). No study has ever examined the association between drivers' attitudes and behaviours and their family backgrounds. Considering the severe consequences caused by numerous road crashes involving SRPG drivers [29] [30], this pioneering study is important for improving contemporary Chinese road safety.

### **1.5 Thesis structure**

This thesis consists of five main chapters. Chapter 1 introduces the research background and current research gap. It also discusses the research significance and identifies relevant hypotheses. Chapter 2 presents a comprehensive literature review and proposes key factors that require research attention. Chapter 3 introduces the methodology that was applied in this study, including questionnaire development, participant recruitment, data collection and statistical techniques. Chapter 4 shows the analysis results for the collected data and summarises relevant conclusions. Chapter 5 presents a discussion on the findings from this study. The implications of the research findings for road safety are discussed, and future research needs are also pointed out.



# Chapter 2: Literature Review

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This chapter will comprehensively review notable studies in the literature that investigated various factors' impact on drivers' road safety performance. The factors reviewed in this chapter include economic, political, cultural, personality and demographic factors.

## 2.1 Economic factors

The relationship between the financial status of the driver and his/her tendency to commit driving violations has been repeatedly investigated by researchers. One study reported that the number of US adult drivers observing speed limits all the time reduced as their incomes increased [33]. However, opposite results have also been found. In New York City, taxicab crashes declined as the driver income per shift increased [34]. Apart from the income level of drivers, the economic background of drivers' families might also be playing a big role in their driving attitudes and behaviours. In China, as in some other countries, some adolescents can afford to buy a car only with the financial assistance of their parents. Danish researchers have pointed out that young drivers, particularly male drivers, face peer pressure from social contacts, which sometimes sees them engage in dangerous driving behaviours, such as speeding and drunk-driving [35]. Therefore, there may be a link between the economic background of young drivers and the level of their risky attitudes and behaviours on the road [31]. As no research has yet examined the influence of economic backgrounds of drivers in China, this study incorporated the economic backgrounds of Chinese young drivers as a key factor to detect its relationship with driving attitudes and behaviours, which filled this research gap.

## 2.2 Political factors

The political background of drivers is also an important factor that is worthy of being taken into account. In China, the political status of government officers is classified into 12 levels, and officers with different ranks of power take charge of different administrative areas. The power they hold may affect not only their specific duties,

but also other local public administration practices, such as traffic safety management. However, some children of these public servants appear to regard their parents' political power as a shield against being punished by public rules [29]. Even worse, some of them appear to have formed a potential consciousness that they have the "privilege" to do something that others cannot do [31]. The political background of drivers has never been included in road safety studies; however, numerous cases of recent severe road crashes have involved young drivers whose parents or close relatives hold political power, which shows the necessity of conducting research that aims to examine the political backgrounds of Chinese young drivers as another key factor that may impact their driving behaviours and attitudes.

### **2.3 Cultural factors**

Previous research has demonstrated that culture can have significant effects on how people perceive and react to their social environments [36]. Hofstede's work-related cultural dimensions [37] [38] have been widely used as a research paradigm in the field of intercultural communication, cross-cultural psychology and international management [39] [40]. It has been reported in a comparative analysis among 46 countries [41] that Hofstede's "Power Distance" dimension [42] showed a significantly positive correlation with road traffic accident fatalities, which means the traffic fatality rates were higher in those countries where people tend to accept a higher degree of unequally distributed power than do people in countries with other cultures. Living in a country that regards its traditional customs as valuable, the Chinese have been deeply affected by their cultural values, which in turn create their unique thinking modes. The Chinese prefer to handle conflicts with the help from powerful friends or family members, which sometimes could be unreasonable to others as they care too much of their own benefits [43]. The large numbers of new and inexperienced drivers may also contribute to aberrant driving behaviours and the high number of crashes in China. One of the possible underlying reasons for this might be that Chinese drivers' earliest considerations of rules and regulations regarding traffic are oriented towards personal benefits, not public security. Many kinds of unlawful behaviours, such as "scrambling" to gain the right of way, are choices that can be made with this "benefits first" thought in mind [44]. As a consequence, it is likely that conflict on the road in China is potentially related to the

impact from the distinctive Chinese culture. No research has yet examined this possibility.

## **2.4 Personality factors**

Research has shown that driver attitudes and behaviours can be influenced by personality traits. In psychology, the Big Five personality traits are five broad domains of personality that are used to describe human personality [45]. This five-factor structure model has been widely used in interviews, self-descriptions and observations by participants of different ages and of different cultures (including China), and it is able to account for diverse traits in personality [46]. The Big Five Dimensions are: extraversion versus introversion (tendency to seek stimulation in the company of others), agreeableness versus antagonism (tendency to be compassionate and cooperative or suspicious and antagonistic towards others), conscientiousness versus lack of direction (tendency to be organised and dependable), neuroticism versus emotional stability (tendency to experience unpleasant emotions easily and the degree of impulse control) and openness versus closeness to experience (the degree of intellectual curiosity and a preference for novelty and variety). Each factor can be further divided into several personality facets. Research on the Big Five Factor model has supported the utility of Extraversion, Neuroticism and Conscientiousness in predicting driving behaviours [47] [48] [49] that higher scores on Extraversion, Neuroticism and lack of direction were associated with more traffic fatalities. However, the findings of predictive utility of Agreeableness and Openness are still inconclusive [50] [51]. Once the specific personality tendencies of risky drivers are identified, relevant education and training programs can be conducted to minimize their negative effects on road safety. Anxiety is found to be significantly correlated to excitement-seeking and risky driving behaviours, which in turn resulted in road crashes in Norway [52]. Normlessness, which means perceiving in a condition that little moral guidance is provided [53], was one of the strongest predictors of driving attitudes and behaviours in both Turkish and Iranian samples [10]. One aim of the current study is to examine various personality dimensions to quantitatively reveal their potential relationships with driving attitudes and behaviours in China.

## **2.5 Demographic factors**

Demographic factors have been shown to play an important role in determining the relationship between individuals and their driving attitudes and behaviours. Age and gender are two key factors prevalent in previous research. The Organisation for Economic Co-operation and Development (OECD) and European Conference of Ministers of Transport have highlighted that although young drivers under the age of 25 comprise only one-tenth of the population of OECD countries, they account for more than a quarter of fatally injured drivers [54]. According to previous studies, speeding remains prevalent among adolescents, which is partly attributable to higher perceived benefits of driving fast than perceived risks. Most youngsters enjoy the feeling of speeding without an accurate judgment of hazard probability and sufficient driving experience to avoid emergencies [55]. The driving experience of a driver can also predict the possibility of being involved in road crashes. Skill training programs for novice drivers may not effectively reduce the rates of their traffic violations, on the contrary, trainees may gain a sense of confidence which brings them higher risk exposure [56]. Gender differences in regard to driving attitudes, behaviours and risk perceptions have also been documented. In Spain, male drivers tended to be more confident than female drivers. In addition, they used safety devices less frequently than women, and they were involved in risky driving behaviours more often [57]. There were also gender differences in the specific driving situations causing anger, showing that male drivers were angrier at police presence, and female drivers at traffic obstructions [58]. Different education levels can also lead to different driving habits. For instance, it was reported in a Turkish study that increased level of education has been associated with increased seat belt usage, lower numbers of crashes and crash severities [59]. A study was conducted at the city level using data of European cities, which indicated that fewer road crashes were reported in larger cities with more public transport and less number of motorcycles [60]. All the demographic factors mentioned above were examined in the current study.

To sum up, the existing studies from the literature have shown that there are differences between road safety performances of drivers from developing and developed countries. Additionally, road safety research conducted in developing countries such as China for young novice drivers is still limited, particularly in the



investigation on the relationship associated with their economic and political background. Consequently, it is necessary to conduct this study to enrich the literature on this important topic.



## Chapter 3: Methodology

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This chapter will introduce the methodologies that were applied in this study, including participant recruitment, questionnaire development, data collection and statistical techniques.

### 3.1 Participants and procedure

Approval for this research was sought and granted by the Human Research Ethics Committee of Queensland University of Technology (Approval Number 1500000125). The target population of this survey was Chinese young people within an age range of 18 to 28 years who also had car-driving experience. This age range was chosen because the officially recognised age range for being an adolescent in China is from 14 to 28 [61]. Furthermore, the minimum age for applying for a driver's license in China is 18 [62]. Another basic requirement for participants was that they must have driving experience, not simply be holders of a driving license. This is because in China, young people may hold a driving license but may not actually drive because of lack of access to a car. As a consequence, they have few opportunities to practice driving skills [63]. In addition, all participants were private car drivers (i.e., excluding holders of truck, taxi, bus and other kinds of license types).

SOJUMP (a Chinese online survey website) was employed to conduct both the questionnaire delivery and retrieval processes. This website has a large sample resource of more than 2.6 million registered respondents and it has been widely used by corporations and universities to conduct online surveys in China, including Samsung, Alibaba, ICBC and Peking University [64]. Participant authenticity was checked using mobile phone or email verifications by the website administrators. The quality of sample was assured in three ways: 1) the questionnaire was sent to target respondents by email based on the specified requirements from the research team (age, car type and driving experience requirements mentioned above); 2) IP address control ensured that a respondent (with the same IP address, computer or

username) could only answer the questionnaire once; 3) any questionnaires with uncompleted questions were excluded [65]. SOJUMP offered participants credits that could be exchanged to gifts as incentives. The final sample size was 476 participants (305 males and 171 females), which was determined by considering both the research budget and the sufficiency of data for statistical analysis.

### **3.2 Questionnaire development**

The questionnaire mainly consisted of a driving attitudes scale, a risky behaviour scale, Hofstede's cultural dimension scale, the Big Five personality scale, and questions on economic background, political background, and some basic demographic factors. The economic background and political background questions were developed specifically for this research, while the rest were developed by other researchers and have been frequently reported in the literature. A copy of the questionnaire is included in Appendix A, while each scale is discussed below.

#### **3.2.1 Driving attitude and risky behaviour scales**

The attitudinal and behavioural scales applied in the current study were developed by Ulleberg and Rundmo in 2000 [66] and have also been applied to investigate the relationship between human factors and young drivers' driving behaviours in several recent studies conducted in Sweden and Norway [67] [68] [69].

The attitude scales included three facets: Traffic flow versus rule obedience (measured by DR1-DR9), Speeding (measured by DR10-DR14), and Fun-riding (measured by DR15-DR17). For example, "Sometimes it is necessary to bend the rules to keep traffic going" is one of the items that measure traffic flow versus rule obedience attitudes; "I think it is OK to speed if the traffic conditions allow you to do so" is one of the items that measure speeding attitudes; "Adolescents have a need for fun and excitement in traffic" is one of the items that measure fun-riding attitudes. As the survey was conducted among Chinese young drivers, we replaced "mile" with "kilometre" in items containing distance messages, because kilometres are the unit of measurement used for Chinese speed limits. The attitudinal items were scored on a

five-point Likert scale ranging from 1=“strongly disagree” to 5=“strongly agree”. Higher scores reflected drivers with more dangerous attitudes towards driving.

Three behavioural sub-scales, Self-assertiveness (measured by RI1-RI5), Speeding (measured by RI6-RI11), and Rule violations (measured by RI12-RI14), were employed to measure respondents’ self-reported acts of traffic risk-taking. For example, “I drive recklessly because others expect me to do it” is one of the items that measures self-assertiveness acts; “Exceed the speed limit in build-up areas by more than 10 km/h” is one of the items that measures self-reported speeding; “Drive on a yellow light when it is about to turn red” is one of the items that measures rule violation acts. The score of each sub-scale was obtained by averaging the scores of items that measure them. The behavioural items were scored on a five-point Likert scale ranging from 1=“never” to 5=“very often”. Higher scores reflected drivers performing traffic risk-taking acts more often. All the sub-scale scores were created by averaging the item scores that measured them.

### **3.2.2 Economic background**

The economic background of each respondent was also evaluated. As China was considered a middle income country according to the World Bank data [70] in 2013, many people in China still remain below the poverty line. Given this level of economic disadvantage in China, private car owners are generally from relatively rich families. Therefore, the income categories for this study were set to cover the medium and higher income level groups. The latest available data of yearly gross income of an urban resident were accessed from the census data on the website of National Bureau of Statistics of China for 2012 [71]. As the average population per family is 3 people in China [72], the average monthly family income of urban residents was calculated. As the calculated result showed, people in the income level groups of 5000-10000 RMB (Renminbi), 10000-20000RMB, and more than 20000 RMB approximately represented the richer half of the whole population, and the proportion of these 3 groups were approximately 4:1:1. As a consequence, to match the census data, we asked SOJUMP to sample people from its participant pool based on this quota selection setting (i.e., the respondents were requested to indicate their

income status to a specific range on the questionnaire). In addition, the economic status of the respondent's parents was gathered. This was considered as an important variable in order to assess the potential association between economic influence and driving behaviours. As has been noted elsewhere, there have been accounts of adolescents from rich families in China exhibiting what could be considered immature thinking and beliefs that they can always handle trouble by using their parents' money and influence [31]. The employment status of each respondent and that of their parents was also collected. The Chinese government has officially classified all jobs into 8 main categories using a national standard [73]. We used these categories on the questionnaire, along with the "no job" and "retired" options.

### **3.2.3 Political background**

Information on the political background of each respondent was also collected. As noted earlier, recent Chinese mass media has reported numerous traffic crashes involving drivers whose parents or close relatives hold considerable political power [31]. China has a specific and strict political system that defines the administrative level of government officers on various positions [74]. Based on this system, we asked respondents to indicate the specific administrative level of their parents or close relatives if one of them does hold a political status. Moreover, the perception of respondents to the political power held by their parents or close relatives and their possible experiences of benefiting from this special power were also evaluated by carefully developed questions. In the questionnaire, respondents were asked to indicate "the impact of your 'parents'/close relatives' political power on your life" on a scale ranging from "no impact" to "large impact", and "Have you benefited from your parents'/close relative's political power" on a scale ranging from "never" to "always". These items were constructed especially for this study, since no such items appear to have been used in research previously.

### **3.2.4 Culture scale**

The cultural influences on respondents were measured using an application of Hofstede's cultural dimension theory [42]. In the current study, a 5-dimension version of Hofstede's theory [75] was employed. The five dimensions included

Power Distance (measured by CU1-CU5), Uncertainty Avoidance (measured by CU6-CU10), Masculinity versus Femininity (measured by CU11-CU15), Individualism versus Collectivism (measured by CU16-CU19) and Long-term Orientation (measured by CU20-CU23). Each item was answered on a five-point Likert scale ranging from 1="strongly disagree" to 5="strongly agree", and the scores of Hofstede's culture dimension sub-scales were obtained by averaging the scores of the items measuring each of them.

### **3.2.5 Personality scale**

Personality traits were measured by the Big Five Inventory, which is based on the Big Five factors. In this study, as personality was not the primary topic of interest, to simplify the content of the questionnaire and to reduce the workload of participants, the short-form inventory [76] consisting of 10 items that measure an individual on these factors was applied. These questions were answered on the five-point Likert scale ranging from "strongly agree" to "strongly disagree". The score of each personality dimension was obtained by using the average number of a positive-scored item and a reverse-scored item (Extraversion: PE1, reverse PE6; Agreeableness: reverse PE2, PE7; Conscientiousness: PE3, reverse PE8; Emotional stability: reverse PE4, PE9; Openness to experiences: PE5, reverse PE10) [76].

### **3.2.6 Demographic and other information**

Demographic information was collected, including gender, age, highest education level and city of usual residency. Although it was hard to get official data for the proportion of male to female drivers in the whole Chinese population, some literature showed that there were more than twice as many men licensed as women in one Chinese Province (i.e., Zhejiang Province: Men = 9,027,532 and women = 3,929,569) [77]. Thus, the ratio 2:1 of male to female drivers was considered to be reasonable for quota selection. Consequently, SOJUMP was asked to control the gender proportion of potential participants at about 2:1 for males to females in order to align with the general driving population in China. Also, respondents were requested to indicate how many traffic violations they had committed in the previous

year, as well as the number of hours they usually drive per week in order to ensure that we recruited people with sufficient driving experience.

### **3.3 Statistical Analysis**

In this study, the potential relationships between Chinese young drivers' attitudes and behaviours and their economic background, political background, cultural perception, personality traits and demographic factors were investigated. All collected questionnaires were completely answered (no missing data), and no trace of inappropriate responding (e.g. choose the same answer option for all questions) was found. In the reliability analysis, the internal reliability of each sub-scale was checked via Cronbach's alpha. Moreover, corresponding measurement models were built for key factors as well. Correlation analysis was conducted for all measured variables to examine the association between variables. Additionally, hierarchical regression, Student's T-test and ANOVA analyses were conducted step by step to investigate the study hypotheses. Then the factor structure for driving attitude, risky behaviour, economic background and political background sub-scales was established using structural equation modelling (SEM).

SEM is a very general statistical modelling technique, which can be viewed as a combination of factor analysis and path analysis. It can be used to evaluate the validity of substantive theories with empirical data. Among the strengths of SEM is the ability to construct latent variables (variables that are not directly observed but can be inferred from other directly measured variables), which allows us to explicitly capture the unreliability of measurement in the model, which in theory allows the structural relations between latent variables to be accurately estimated. The relationships between the theoretical constructs are represented by regression or path coefficients between the factors [78]. SEM analysis can deal with a number of independent variables simultaneously, and it can also evaluate and compare different theoretical models [79]. The main SEM analysis procedures include: first, model specification, which is to build a structural model showing potential causal dependencies between endogenous variables (variables that can be determined and explained by other variables within the model) and exogenous variables (variables



that only determine other variables and are not influenced by variables within the model) and a measurement model showing the relations between latent variables and their indicators; second, model estimation, which is to compare the actual covariance matrices representing the relationships between variables and the estimated covariance matrices of the best fitting model; thirdly, model evaluation, which is to calculate how well the proposed model fits the actual data; next, model modification (re-specification), which is in order to find defects of the model and improve the fit; finally, model interpretation, which is to explain relationships between variables based on the best fitting model [80]. All statistical analyses were conducted using Mplus version 7.11 [81] and IBM SPSS Statistics 21 [82].



# Chapter 4: Results

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This chapter will present basic information of respondents who participated in the survey, and discuss the analysis results in detail, including reliability analysis, correlation analysis, hierarchical regression analysis, independent-samples T-test analysis, ANOVA analysis and structural equation modelling analysis. The support for the hypotheses of this research (identified in Chapter 1) will also be discussed.

## 4.1 Basic characteristics of respondents

A total of 476 Chinese young drivers participated in the survey and submitted the completed questionnaires to SOJUMP. As shown in Table B.1 in the Appendix, the majority (82%) of participants are aged between 24 and 28 years, while only 2.94% of participants are aged between 18 to 20 years. This condition is quite understandable because most Chinese youngsters are still studying at universities before 23 years of age, and may not be able to afford to buy a car with their own money. Additionally, approximately half the sample (47.69% of participants) reported 1-3 years of driving experience. This result is consistent with the age data considering many Chinese young people can get their driving licenses during the university period when they have enough spare time to learn how to drive. Table B.1 also shows that all participants are private car drivers, which meets the basic inclusionary requirements for participants of this study.

### 4.1.1 Demographic information of respondents

Table 1 displays some basic demographic information of the participants of this study. Male participants account for 64.1% of the whole sample, which meets the gender proportion requirement of 2:1 that aligns with the driving population in China [77]. The majority of participants (79.8%) hold a bachelor degree. Participants' usual residency is categorised into 4 different levels of cities based on the China Mainland City Classification Specification [83], which ranges from Level 1 (the smallest cities) to Level 4 (the largest cities, with population over 10 million and GDP over 750 billion yuan). According to the result of this categorisation, 14.3% of participants live in Level 1 cities, while 14.7%, 29.8% and 41.0% of participants live in Level 2, Level 3 and Level 4 cities, respectively. Table 1 also shows the

traffic tickets that participants reported receiving in the previous year. Just less than half the sample (46.0%) reported receiving no tickets in the last year, just more than half (50.5%) reported receiving between 1 and 3 tickets, and only 0.63% of participants (3 people) reported receiving 5 or more tickets in the last year. The average driving hours per week of participants were also collected: most participants drive 5-10 hours (36.6%) and 10 to 20 hours (37.0%) per week, suggesting a sample of young Chinese people with regular driving experience.

*Table 1 Demographic information of respondents*

Gender Proportion (%)	Male 64.1			Female 35.9		
Highest education level Proportion (%)	Senior high school 2.7	Junior college 1.9	Undergraduate degree 79.8	Master degree 15.3	PhD degree 0.2	
Residency city level Proportion (%)	Level 1 14.3		Level 2 14.7	Level 3 29.8	Level 4 41.0	
Received traffic tickets last year Proportion ( % )	0 46.0	1 20.0	2 20.4	3 10.1	4 2.9	$\geq 5$ 0.6
Driving hours per week Proportion (%)	$\leq 5$ 17.9	5.01-10 36.6		10.01-20 37.0		$> 20$ 8.6

#### **4.1.2 Economic background information of participants**

Table 2 shows the distribution of participants' reported personal and parents' monthly income. As illustrated, the proportion of the three groups (5001-10000RMB, 10001-20000RMB and above 20000RMB) are 60.29%, 22.27% and 17.44% respectively. Accordingly, the reported pre-tax monthly income of most participants was between 2500 and 5000RMB (27.94%), and the pre-tax monthly income of their parents are concentrated in the 5001-10000RMB group (50.63%). For the job type, most participants reported working as "professionals" (42.65%), and most of their fathers were reported to be also working as

“professionals” (21.43%). The case is a little different for mothers of participants, with most reported as clerks (19.96%).

*Table 2 Economic background information of participants*

Participant's pre-tax monthly income (RMB)	Proportion (%)
≤2500	4.0
2501-5000	27.9
5001-7500	26.9
7501-10000	18.5
10001-20000	17.2
20001-50000	5.5
>50000	0
Parents' pre-tax monthly income (RMB)	Proportion (%)
≤5000	12.2
5001-10000	50.6
10001-15000	22.3
15001-20000	12.2
20001-40000	2.7
40001-100000	0
>100000	0

#### **4.1.3 Political background information of participants**

As Table 3 displays, 32.8% of participants indicated that their parents or close relatives hold a political status. Most of these politicians are at the section chief (ke zhang) level (41.7%), which is the second lowest level in the Chinese administrative level system. Among the 32.8% who reported political status of parents/close relatives, when talking about the impact of parents'/close relatives' political power on life, most participants chose the “little impact” (37.8%) and “some impact” (39.7%) options. Only 13.5% of participants reported that the power of parents/relatives has no impact on their own life, and 9% reported a large impact. Approximately three quarters (65%) of participants reported that they have never, or rarely benefited from the power held by their parents/close relatives, while 31.4% of participants admitted that sometimes they have actually benefited from the power.

*Table 3 Political background information of participants*

Parents/close relatives hold a political status or not Proportion (%)	Yes 32.8		No 67.2		
Administrative level Proportion (%)	Director of an institute (suo zhang) 13.5	Section chief (ke zhang) 41.7	Division head (chu zhang) 35.9	Head of a department (ting zhang) and above 9.0	
Power impact level Proportion (%)	No 13.5	Little 37.8	Some 39.7	Large 9.0	Not sure 0
Frequency of benefiting from political power Proportion (%)	Never 18.6	Rarely 46.2	Sometimes 31.4	Often 3.2	Always 0.6

#### **4.2 Reliability analysis of sub-scales**

A reliability analysis of sub-scales was conducted for driving attitudes, risky behaviours and culture, respectively, to check if the items that measure each sub-scale should be kept or deleted to improve the reliability performance of the overall scale. Table B.2 in the Appendix shows the original number of items, mean scores and Cronbach's alpha co-efficients for scales of driving attitudes, risky behaviours and culture. Most of the sub-items performed well with alpha values above 0.7 [84], but the output of item statistics showed that there was a potential to increase the Cronbach's alpha value of several cultural sub-scales by deleting some items. These findings were consistent with the outputs of confirmatory factor analysis conducted using Mplus, which showed that the local fit of the sub-scales containing these items does not perform well. In other words, these results were indicating that these items were not consistent with what the other items combined in these sub-scales were assessing.

Besides the statistical evidences, there are also practical reasons for deleting these items. To be specific, the alpha value of Power Distance was increased to 0.647 from 0.619 by deleting

item CU5 (Managers should not delegate important tasks to employees). The practical reason for deleting this item is that Chinese participants in organisations with low power distance might believe that managers are more capable to handle important tasks [85], which may lead them to report “Agree” in the questionnaire, like what participants in organisations with high power distance tend to do; the alpha value of Collectivism was increased from 0.783 to 0.824 by deleting item CU18 (Being accepted by the members of your workgroup is very important). The practical reason for deleting this item is that although employees with high individualistic values are hard to be accepted by the members of their workgroups, employees with high collectivistic values might also isolate those colleagues who are not within their groups [86]; the alpha value of Long-term orientation was increased from 0.493 to 0.525 by deleting CU23 (Having a sense of shame is important in the workplace). The practical reason for deleting this item is that the sense of shame is no longer an important feature in contemporary Chinese society, which emphasises more on self-confidence and self-promoting [87].

As a consequence, we decided to remove these items from the measurement scales. However, the alpha value of Long-term orientation sub-scale was still far from the threshold value that could be considered as acceptable. As indicated by previous literature, a low value of alpha could be due to a low number of questions, poor inter-relatedness between items or heterogeneous constructs [84]. Considering that the Long-term orientation sub-scale was developed based on traditional Chinese culture (Confucianism, developed 2,000 years ago), there is a possibility that the impacts from this traditional theory on contemporary Chinese youngsters have changed [88]. At last, CU5, CU18 and the Long-term orientation sub-scale (CU20-CU23) were removed from further analysis. Table 4 shows the improved reliability performance of the sub-scales after the revision of items.

*Table 4 Number of items, mean scores and Cronbach's alpha for scales of Driving Attitudes, Risky Behaviours and Culture*

Scales	Number of items	Mean (range 1-5)	S.D.	Cronbach's alpha
<i>Driving Attitudes</i>				
Traffic flow vs. rule obedience	9	2.26	0.66	0.850
Speeding	5	2.35	0.81	0.864
Fun-riding	3	2.24	0.81	0.704
<i>Risky Behaviours</i>				
Self-assertiveness	5	1.87	0.66	0.842
Speeding	6	2.00	0.65	0.847
Rule violations	3	1.79	0.64	0.672
<i>Culture</i>				
Power distance*	4	2.95	0.56	0.647
Uncertainty avoidance	5	4.03	0.52	0.778
Masculinity	5	3.20	0.77	0.851
Collectivism*	3	4.00	0.60	0.824

\*One item of this sub-scale was removed.

### **4.3 Correlation analysis**

To explore the associations between key variables in the study, correlational analyses were conducted. To conduct the correlation analysis for all variables, the scores of subscales of driving attitudes, risky behaviours, culture and personality were first respectively calculated [66] [75] [76]. Correlation analysis was implemented for the following variables: three driving attitude sub-scales (Traffic flow vs. rule obedience, Speeding and Fun-riding); three risky behaviour sub-scales (Self-assertiveness, Speeding and Rule-violations); four culture sub-scales (Power Distance, Uncertainty Avoidance, Masculinity and Collectivism); five personality sub-scales (Extraversion, Agreeableness, Conscientiousness, Emotional Stability, Openness to Experiences); two income variables (Self-income and Parents' income); other variables including age, driving experience, gender, education level, city of residence, number of traffic tickets received in the last year and driving hours per week.

The relationships among the variables mentioned above will be discussed in the next section, and the correlation in terms of political power will then be analysed in section 4.3.2 and section 4.3.3 for participants with or without parents/close relatives who hold political power.



A comparison analysis between participants with and without a political background will be presented in section 4.3.4.

#### **4.3.1 Correlational analysis for all participants**

The bivariate correlation analysis matrix in Appendix C shows a preliminary and straightforward view of bivariate correlations between each pair of variables. As both continuous and ordinal variables were applied in this study, Spearman's rho value was applied to check the correlation degree of each pair of them [89].

Age is significantly and negatively correlated with the "traffic flow vs. rule obedience" sub-scale ( $r = -.122$ ,  $p = .008$ ), which indicates that participants tend to report more favourable attitudes towards obeying traffic rules as their ages increase. No other significant correlations were found between age and other attitudinal and behavioural sub-scales.

Gender was significantly and negatively correlated with two of the attitudinal sub-scales: "traffic flow vs. rule obedience" ( $r = -.141$ ,  $p = .002$ ) and "fun-riding" ( $r = -.166$ ,  $p < .01$ ); and with one behavioural sub-scale: "self-assertiveness" ( $r = -.156$ ,  $p = .001$ ). These results indicate that female participants reported significantly less favourable attitudes towards breaking traffic rules to keep traffic flowing and to fun riding, and they also reported "giving opinions in a powerful way to get noticed by others" less frequently.

In addition, driving experience was significantly and negatively correlated with "traffic flow vs. rule obedience" ( $r = -.164$ ,  $p < .01$ ) and "fun-riding" ( $r = -.101$ ,  $p = .028$ ) attitudes. This finding indicates that the longer driving experience participants reported, the less favourable attitudes towards breaking the law to keep traffic flowing and to fun riding they reported.

The education level of participants is significantly and negatively correlated with all three driving attitude sub-scales, which indicates that participants with a higher education level reported less favourable attitudes towards unsafe driving. The city level of residency is significantly and negatively correlated with "traffic flow vs. rule obedience" ( $r = -.120$ ,  $p =$

.009) and “fun-riding” ( $r = -.095$ ,  $p = .037$ ) attitude sub-scales, which indicated that participants living in larger cities reported less favourable attitudes towards violating traffic rules to keep traffic flowing and to fun-riding.

#### **4.3.2 Correlation analysis for participants whose parents/close relatives hold political power**

To check the effects of political power on driving attitudes and risky behaviours, correlation analysis was conducted for participants whose parents/close relatives hold political power and then for participants who indicated no association with political power. Table 5 shows the correlation matrix of driving attitude scales, risky behaviour scales, income status and power status for participants whose parents/close relatives hold political power. As the table displays, for participants from “a political family”, the Self-income scores are positively and significantly correlated with all three power-related variables, including Power Level ( $r = .164$ ,  $p = .040$ ), Power Impact ( $r = .334$ ,  $p < .01$ ) and Power Benefits ( $r = .187$ ,  $p = .019$ ). In other words, participants who reported higher levels of family political status, more impact in life from political power and more often benefiting from political power also reported higher monthly personal income. In contemporary Chinese society, it is common that graduates from political families can receive good employment opportunities with the help of political power [90]. This finding supports that situation. Parental income is significantly and negatively correlated with the “fun-riding” attitude sub-scale ( $r = -.199$ ,  $p = .013$ ) and the risky behaviour “speeding” sub-scale ( $r = -.190$ ,  $p = .017$ ), which means the higher income that participants’ parents have, the less favourable attitudes towards “fun-riding” and the fewer speeding acts participants reported. However, none of the driving attitude scales or risky behaviour scales are significantly correlated with Self-income, which is different from the findings reported above for the whole sample (Section 4.3.1). The Power Impact scale is significantly and positively correlated with the risky behaviour “speeding” ( $r = .238$ ,  $p = .003$ ), which means the more a participants’ life is impacted by political power, the more speeding behaviours they reported. The Power Benefits scale is significantly and positively correlated with the driving attitude “speeding” ( $r = .157$ ,  $p = .050$ ), and the risky behaviour sub-scales of “speeding” ( $r = .227$ ,  $p = .004$ ) and “rule violation” ( $r = .175$ ,  $p = .029$ ). These results indicate that the more frequently participants reported benefiting from family political power, the more favourable attitudes towards speeding and more frequent speeding and rule violating behaviours they reported.

Table 5 Correlation matrix of driving attitude scales, risky behaviour scales, income status and power status for participants whose parents/close relatives hold political power. N=156

	<i>Driving attitudes</i>		<i>Risky behaviours</i>								
	Traffic flow vs. rule obedience	Speeding	Fun-riding	Self-assertiveness	Speeding	Rule violations	Self-income	Parents' income	Power level	Power impact	Power benefits
<i>Driving attitudes</i>											
Traffic flow vs. rule obedience	1.000										
Speeding	.667**	1.000									
Fun-riding	.623**	.482**	1.000								
<i>Risky behaviours</i>											
Self-assertiveness	.534**	.409**	.460**	1.000							
Speeding	.661**	.618**	.491**	.620**	1.000						
Rule violations	.495**	.404**	.301**	.518**	.550**	1.000					
Self-income	-.043	-.042	-.130	-.027	-.070	-.009	1.000				
Parents' income	-.084	-.091	-.199*	-.077	-.190*	-.077	.283**	1.000			
Power level	-.078	-.066	-.135	-.116	.014	-.112	.164*	.160*	1.000		
Power impact	.102	.110	.022	.142	.238**	.149	.334**	.146	.045	1.000	
Power benefits	.136	.157*	.034	.125	.227**	.175*	.187*	.020	-.011	.582**	1.000

Notes: \*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Driving attitude scales range from 1="strongly disagree" to 5="strongly agree"; Risky behaviour scales range from 1="never" to 5="very often"; Self-income scale ranges from 1="no more than 2500" to 7="more than 50000"; Parents' income scale ranges from 1="no more than 5000" to 7="more than 100000"; Power level scale ranges from 1="director of an institute (suo zhang)" to 4="head of a department (ting zhang) and above";

Power impact scale ranges from 1="no impact" to 4="large impact"; Power benefits scale ranges from 1="never" to 5="always"; Tickets scale ranges from 1="0" to 6="5 or more ".

Regarding cultural factors, the bivariate correlation analysis result shows that Hofstede's sub-scales of Power Distance and Masculinity are significantly and positively correlated with most of driving attitude and behaviour sub-scales, which indicates that participants who were "more likely to accept and expect that power was distributed unequally" or who preferred cultural values such as "competitiveness, assertiveness, materialism, ambition and power" reported more favourable attitudes towards unsafe driving and more risky behaviours. On the other hand, the other two cultural sub-scales – Uncertainty Avoidance and Collectivism – are significantly and negatively correlated with most of attitude and behaviour sub-scales, which indicates that participants who liked to be "integrated into groups" or attempted to "cope with anxiety by minimising uncertainty" reported less favourable attitudes towards unsafe driving and less risky behaviours.

With regard to personality, all five personality dimensions (Extraversion, Agreeableness, Conscientiousness, Emotional stability and Openness to experiences) are significantly and negatively correlated with most of the driving attitude and risky behaviour sub-scales. This finding indicates that participants who have the personality traits of more extraversion/agreeableness/conscientiousness/emotional stability/openness to experience than introversion/antagonism/lack of direction/neuroticism/closeness to experience reported less favourable attitudes towards unsafe driving and less risky behaviours.

Furthermore, gender is significantly and negatively correlated with the "traffic flow vs. rule obedience" ( $r = -.228, p = .004$ ) and "fun-riding" attitudes ( $r = -.248, p = .002$ ) and "self-assertiveness" ( $r = -.228, p = .004$ ) behaviours, which indicates that female participants reported significantly less favourable attitudes towards these dangerous attitudes and less risky behaviours than male participants. The education level of participants is significantly and negatively correlated with all three driving attitude sub-scales and speeding behaviours, which indicates that participants with higher education levels reported less favourable attitudes towards unsafe driving and less speeding behaviours. The number of tickets participants received in the previous year is significantly and positively correlated with almost all attitude and behaviour sub-scales, which indicates that participants who reported receiving more tickets in the previous year also reported more favourable attitudes towards unsafe driving and more risky behaviours.

### **4.3.3 Correlation analysis for participants whose parents/close relatives do not hold political power**

The correlation matrix of driving attitude scales, risky behaviour scales and income status for participants without parents/close relatives who hold political power is displayed in Table 6. The Self-income status is significantly and negatively correlated with the driving attitude scale “traffic flow vs. rule obedience” ( $r = -.179$ ,  $p = .001$ ). This finding indicates that the higher the personal income reported by participants without political background, the less favourable attitudes they have towards violating traffic rules.

The bivariate correlation analysis result shows that age is significantly and negatively correlated with “traffic flow vs. rule obedience” ( $r = -.144$ ,  $p = .010$ ) attitude sub-scale, which means that participants without political background reported more favourable attitude towards obeying traffic rules as their age increased. Gender is significantly and negatively correlated with “fun-riding” ( $r = -.129$ ,  $p = .021$ ) attitudes and “self-assertiveness” ( $r = -.123$ ,  $p = .027$ ) behaviours, which indicates that female participants reported significantly less favourable attitudes towards fun-riding and less self-assertiveness behaviours than male participants.

Regarding cultural factors, Power Distance and Masculinity are significantly and positively correlated with most of driving attitude and behaviour sub-scales, which indicates that participants who were “more likely to accept and expect that power was distributed unequally” or who preferred cultural values such as “competitiveness, assertiveness, materialism, ambition and power” reported more favourable attitudes towards unsafe driving and more risky behaviours. On the other hand, the other two cultural sub-scales – Uncertainty Avoidance and Collectivism – are significantly and negatively correlated with most of attitude and behaviour sub-scales, which indicates that participants who liked to be “integrated into groups” or attempted to “cope with anxiety by minimising uncertainty” reported less favourable attitudes towards unsafe driving and less risky behaviours.

Table 6 Correlation matrix of driving attitude scales, risky behaviour scales, income status and power status for participants whose parents/close relatives do not hold political power. N=320

	<i>Driving attitudes</i>		<i>Risky behaviours</i>					
	Traffic flow vs. rule obedience	Speeding	Fun-riding	Self-assertiveness	Speeding	Rule violations	Self-income	Parents' income
<i>Driving attitudes</i>								
Traffic flow vs. rule obedience	1.000							
Speeding	.624**	1.000						
Fun-riding	.559**	.611**	1.000					
<i>Risky behaviours</i>								
Self-assertiveness	.587**	.525**	.581**	1.000				
Speeding	.629**	.658**	.543**	.678**	1.000			
Rule violations	.496**	.432**	.411**	.632**	.581**	1.000		
Self-income	-.179**	-.069	-.103	-.043	-.050	.021	1.000	
Parents' income	-.004	.013	.044	.085	.105	.064	.288**	1.000

Notes: \*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Driving attitude scales range from 1="strongly disagree" to 5="strongly agree"; risky behaviour scales range from 1="never" to 5="very often"; self-income scale ranges from 1="no more than 2500" to 7="more than 50000"; parents' income scale ranges from 1="no more than 5000" to 7="more than 100000"; tickets scale ranges from 1="0" to 6="5 or more".





With regard to personalities, all five personality dimensions (Extraversion, Agreeableness, Conscientiousness, Emotional stability and Openness to experiences) are significantly and negatively correlated with almost all driving attitude and risky behaviour sub-scales. This finding indicates that participants who have the personality traits of more extraversion/agreeableness/conscientiousness/emotional stability/openness to experience than introversion/antagonism/lack of direction/neuroticism/closeness to experience reported less favourable attitudes towards unsafe driving and less risky behaviours.

Additionally, driving experience is significantly and negatively correlated with “traffic flow vs. rule obedience”(r = -.186, p = .001) attitude, which indicates that participants with a longer driving experience reported more favourable attitudes towards obeying traffic rules to maintain traffic flow. The number of traffic infringement tickets participants reported receiving in the previous year is significantly and positively correlated with all three behaviour sub-scales, which indicates that participants who reported receiving more tickets in the previous year also reported more risky behaviours. The number of hours participants drive per week is significantly and negatively correlated with “traffic flow vs. rule obedience”(r = -.192, p = .001) attitude, “speeding”(r = -.118, p = .035) attitude, “speeding”(r = -.142, p = .011) behaviour and “rule violation”(r = -.119, p = .034) behaviours, which indicates that participants who drive for more time per week reported less favourable attitudes towards violating traffic rules to keep traffic flowing, less favourable attitudes towards speeding, and less speeding and rule violation behaviours.

#### **4.3.4 Comparison analysis for participants with and without political background**

As we can see from the findings shown above, there are obvious differences in driving attitudes and risky behaviours between participants with or without family political background at the bivariate analysis level. There is a table concisely summarising the relationships between driving attitudes, risky behaviours and all

predictive factors for participants with and without political background in the Appendix C.

First, for participants with political background, their personal incomes are not significantly correlated with any subscale of driving attitudes and risky behaviours. However, for participants without political background, personal income is negatively and significantly correlated with the “traffic flow vs. rule obedience” attitude scale, which means that this group of participants reported more favourable attitudes towards obeying traffic rules as their income increases. Second, the income of participants’ parents who have political power shows a negative and significant correlation with fun-riding attitudes and speeding behaviours, which indicates that the higher their parents’ income, the less favourable attitudes towards fun-riding and less speeding behaviours they reported. For participants without political background, parental income does not have significant correlations with any attitude or behaviour subscales.

For participants with political background, there is no significant correlation between age and driving attitude or risky behaviour sub-scales. However, age is significantly and negatively correlated with “traffic flow vs. rule obedience” attitude sub-scale for participants without political background.

Driving experience does not show significant correlations with any driving attitude or risky behaviour sub-scales for participants with political background, while it is significantly and negatively correlated with “traffic flow vs. rule obedience” attitude for participants without political background. The education level of participants is significantly and negatively correlated with all three driving attitude sub-scales and speeding behaviours for participants with political background, however, there is no significant correlation between education level and any driving attitude or risky behaviour sub-scales for participants without political background.

The number of traffic infringement tickets participants reported receiving in the previous year is significantly and positively correlated with almost all attitude and behaviour sub-scales for participants with political background, while it is only significantly and positively correlated with the three behaviour sub-scales for participants without political background. The number of hours participants drove per week is not significantly correlated with any driving attitude or risky behaviour sub-scales for participants with political background, but it is significantly and negatively correlated with “traffic flow vs. rule obedience” attitude, “speeding” attitude, “speeding” behaviour and “rule violation” behaviour for participants without political background.

The city level of residency is not significantly related to any driving attitude or risky behaviour sub-scales for participants with and without political background, but it is significantly and negatively correlated with “traffic flow vs. rule obedience” and “fun-riding” attitude sub-scales for the sample of all participants.

Meanwhile, similarities have also been found between participants with and without political background. The correlations between cultural dimensions and driving attitude and risky behaviour sub-scales for participants with and without political background are almost the same. More specifically Power Distance and Masculinity are significantly and positively correlated with most of the driving attitude and behaviour sub-scales, while Uncertainty Avoidance and Collectivism are significantly and negatively correlated with most of the attitude and behaviour sub-scales.

With regard to correlations between personality traits and driving attitude and risky behaviour sub-scales, the findings for participants with and without political background are also consistent. All five personality dimensions (Extraversion, Agreeableness, Conscientiousness, Emotional stability and Openness to experiences) are significantly and negatively correlated with most of driving attitude and risky behaviour sub-scales.

Gender is significantly and negatively correlated with “traffic flow vs. rule obedience”, “fun-riding” attitudes and “self-assertiveness” behaviours for participants with political background. This finding is similar to that for participants without political background.

#### **4.4 Hierarchical regression analysis**

As there were various factors showing significant relationships with driving attitudes and risky behaviours in the bivariate correlation analysis, there was a need to test the extent of impacts for different predictive factors on self-reported risky driving behaviours. To address this need, Hierarchical regression analysis [91] was employed to investigate the relative contribution of specific driving attitude and other predictors to specific risky behaviour for the whole sample. This analysis allowed for the unique contribution of each distinct set of variables to be assessed. By checking the correlation matrix for all participants, two sets of driving attitude – risky behaviour combinations were identified for further investigation: first, the relative contribution of prediction to “rule violation” behaviour by “traffic flow vs. rule obedience” ( $r = .499, p < .001$ ) attitude and potentially associated predictors was examined; next, the relative contribution of prediction to “speeding” behaviour by “speeding” ( $r = .644, p < .001$ ) attitude and potentially associated predictors was examined.

First, two basic demographic variables, age and gender, were identified as the potentially associated predictors in the first block; next, because of the strong bivariate correlation with driving attitude and risky behaviour sub-scales, 4 cultural dimension sub-scales (Power Distance, Collectivism, Masculinity, Uncertainty Avoidance) were identified as the potentially associated predictors in the second block; then the specific attitude sub-scale of each analysis was selected as the predictor in the third block because of the well-documented association between attitudes and behaviours in social psychological theories [32]. The analyses were processed using SPSS 21.0.

#### **4.4.1 Hierarchical regression analysis of “Traffic flow vs. rule violation” driving attitude on “Rule violations” behaviour**

Table 7 displays the model information for hierarchical regression analysis of “Traffic flow vs. rule violation” driving attitude on “Rule violations” behaviour. As shown in the table, the percentage of overall explained variance in the model is 35.9%, and each block of predictors explains the variances by the percentage of 0.6%, 18.5% and 17.8%, respectively. The significant predictors in the final model are Power Distance ( $\beta = .138$ ,  $p = .001$ ), Uncertainty Avoidance ( $\beta = -.129$ ,  $p = .008$ ), Collectivism ( $\beta = -.158$ ,  $p = .001$ ) and “Traffic flow vs. rule obedience” attitude ( $\beta = .467$ ,  $p < .001$ ). These results suggest that participants who “were more likely to accept and expect that power was distributed unequally”, “did not like to cope with anxiety by minimising uncertainty”, “did not like to be integrated into groups” and reported favourable attitudes towards breaking laws to keep traffic flowing, also reported more rule violations. Consequently, age and gender make no significant contribution to the prediction, cultural dimensions make a relatively important contribution to the prediction, and attitude towards “Traffic flow vs. rule obedience” also contributes significantly to “Rule violations” behaviour in the model.

Table 7 Model summary information for Hierarchical regression analysis of variables predicting “Rule violations” behaviour

Model	$\beta$	R	R Square	Adjusted R Square	R Square Change
1 <sup>a</sup>					
Age	-.012				
Gender	-.074	.074	.006	.001	.006
2 <sup>b</sup>					
Age	.013				
Gender	.009				
Power distance	.197**				
Uncertainty avoidance	-.221**				
Masculinity	.211**				
Collectivism	-.238**	.437	.191	.181	.185
3 <sup>c</sup>					
Age	.053				
Gender	.032				
Power distance	.138**				
Uncertainty avoidance	-.129**				
Masculinity	.079				
Collectivism	-.158**				
Traffic flow vs. rule obedience	.467**	.607	.368	.359	.178

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

a. Predictors: (Constant), Gender, Age

b. Predictors: (Constant), Gender, Age, Collectivism, Power distance, Masculinity, Uncertainty avoidance

c. Predictors: (Constant), Gender, Age, Collectivism, Power distance, Masculinity, Uncertainty avoidance, Traffic flow vs. rule obedience

#### 4.4.2 Hierarchical regression analysis of “Speeding” driving attitude on “Speeding” behaviour

Table 8 displays the model information for hierarchical regression analysis of “Speeding” driving attitude on “Speeding” behaviour. As shown in the table, the percentage of overall explained variance in the model is 48.0%, and each block of predictors explains the variances by the percentage of 0.5%, 21.3% and 26.7%, respectively. Collectivism ( $\beta = -.085$ ,  $p = .040$ ) and Speeding attitude ( $\beta = .562$ ,  $p$

< .001). These results suggest that participants who “were more likely to accept and expect that power was distributed unequally”, “did not like to cope with anxiety by minimising uncertainty”, “preferred competitiveness, assertiveness, materialism, ambition and power”, “did not like to be integrated into groups” and reported favourable attitudes towards speeding, also reported more speeding behaviours. Consequently, age and gender make no significant contribution to the prediction, cultural dimensions make a relatively important contribution to the prediction, and attitude towards speeding also contributes significantly to speeding behaviour in the model.

*Table 8 Model summary information for Hierarchical regression analysis of variables predicting “Speeding” behaviour*

Model	$\beta$	R	R Square	Adjusted R Square	R Square Change
1 <sup>a</sup>					
Age	-.029				
Gender	-.090*	.094	.009	.005	.009
2 <sup>b</sup>					
Age	-.019				
Gender	.013				
Power distance	.244**				
Uncertainty avoidance	-.235**				
Masculinity	.279**				
Collectivism	-.189**	.471	.222	.212	.213
3 <sup>c</sup>					
Age	-.008				
Gender	.018				
Power distance	.137**				
Uncertainty avoidance	-.171**				
Masculinity	.129**				
Collectivism	-.085*				
Speeding	.562**	.699	.488	.480	.267

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

a. Predictors: (Constant), Gender, Age

b. Predictors: (Constant), Gender, Age, Collectivism, Power distance, Masculinity, Uncertainty avoidance

c. Predictors: (Constant), Gender, Age, Collectivism, Power distance, Masculinity, Uncertainty avoidance, Speeding

#### **4.5 T-test analyses and ANOVA for attitudinal and behavioural sub-scales to examine differences according to family background**

As a crucial factor to this research, “whether the participant has parents/close relatives who hold political power or not” was tested using Independent-samples T-test to see if participants’ answers on driving attitude and risky behaviour scales were significantly influenced by this factor. Then, to further detect possible factors that influence participants’ answers on driving attitude and risky behaviour scales, ANOVA analysis was employed to determine if there are any specific factors among



economic background and political background factors that significantly influence the mean scores of driving attitudes and risky behaviours.

#### 4.5.1 Independent-samples T-test

Independent-samples T-test was employed to check if there is a significant difference between the mean scores on three driving attitude sub-scales and three risky behaviour sub-scales using “whether the participant has parents/close relatives who hold political power or not” as the grouping variable. As shown in Table 9, for each driving attitude and risky behaviour sub-scale, all t values are not significant. In other words, the means of participants’ answers on driving attitude and risky behaviour sub-scales are not significantly influenced by whether they have a political background or not.

*Table 9 Independent samples T test for driving attitudes and risky behaviours*

	Variable	N	Mean	t	Sig. (2-tailed)
Pair 1	Traffic flow vs. rule	156	2.23	-.728	.467
	obedience	320	2.27		
Pair 2	Speeding attitudes	156	2.29	-1.104	.270
		320	2.38		
Pair 3	Fun-riding	156	2.23	-.192	.848
		320	2.25		
Pair 4	Self-assertiveness	156	1.90	.696	.487
		320	1.85		
Pair 5	Speeding behaviours	156	1.98	-.440	.660
		320	2.01		
Pair 6	Rule violations	156	1.74	-1.235	.218
		320	1.81		

#### 4.5.2 ANOVA analysis for attitude and behaviour sub-scales using economic and political background sub-scales as factors

The ANOVA (Analysis of variance) was conducted for all driving attitude and risky behaviour sub-scales using economic background sub-scales (Self-income and Parents' income) and political background sub-scales (Power Level, Power Impact and Power Benefits) as factors for participants with and without political background, separately. Only significant findings from these ANOVA analyses are presented below.

One significant finding occurred when Power Impact was applied as the factor testing the mean difference of speeding behaviour ( $p = .022$ ) for participants with political background. This finding indicates that the answers of speeding behaviour reported by participants with political background showed a significant difference based on their different answers on Power Impact. As the participants who reported "Large impact" only accounts for 9.0%, which is much smaller than other groups, we combined the participants who reported "Some impact" and "Large impact" as a whole group. Table 10 shows the ANOVA analysis for speeding behaviours using Power Impact as the factor ( $p = .008$ ), which indicates that participants who reported more impacts from the political power in life also reported more often speeding behaviours.

*Table 10 ANOVA analysis significant findings using Power Impact as factor for participants with political background*

Variable	Impact level of political power (answer score)	Percentage of sample	Mean scores	F
Speeding behaviours	No impact (1)	13.5	1.75	4.969**
	Little impact (2)	37.8	1.86	
	Some impact & Large impact (3&4)	48.7	2.14	

\*\* . Mean squares are significantly different at the 0.01 level.

The other two significant findings occurred when Power Benefits was applied as the factor testing the mean difference of speeding attitude ( $p = .032$ ) and speeding behaviour ( $p = .021$ ) for participants with political background. This finding

indicated that the answers of speeding attitude and speeding behaviour reported by participants with political background showed a significant difference based on their different answers on Power Benefits. As the participants who reported “Often” and “Always” only accounts for 3.2% and 0.6% separately for speeding attitude, which are much smaller than other groups, we combined the participants who reported “Sometimes”, “Often” and “Always” as a whole group. Similarly, we also combined the participants who reported “Sometimes”, “Often” and “Always” as a whole group for speeding behaviour because participants who reported “Often” and “Always” only accounts for 3.2% and 0.6% separately. As shown in Table 11, participants who reported benefiting more often also reported more favourable attitude towards speeding ( $p = .029$ ), and these participants also reported more often speeding behaviours ( $p = .010$ ).

*Table 11 ANOVA analysis significant findings using Power Benefits as factor for participants with political background*

Variable	Frequency of benefiting from power (answer score)	Percentage of sample	Mean scores	F
Speeding attitude	Never (1)	18.6	2.06	3.615*
	Rarely (2)	46.2	2.23	
	Sometimes, Often & Always (3,4&5)	35.3	2.51	
Speeding behaviour	Never (1)	18.6	1.71	4.798**
	Rarely (2)	46.2	1.95	
	Sometimes, Often & Always (3,4&5)	35.3	2.15	

\*\* . Mean squares are significantly different at the 0.01 level.

\* . Mean squares are significantly different at the 0.05 level.

As no significant results were found for participants with political background using Power Level as the factor, neither for participants without political background using economic and political background sub-scales as factors, relevant tables will not be displayed here.

## **4.6 Structural equation modelling and mediating relationship analysis**

To further test the relationships reported above and to reveal associations between factors in a more comprehensive manner, the structural equation modelling analysis was conducted including driving attitude sub-scales (traffic flow vs. rule obedience, speeding, fun-riding), risky behaviour sub-scales (self-assertiveness, speeding, rule violations), economic background sub-scales (Self-income and Parents' income) and political background sub-scales (Power Level, Power Impact and Power Benefits). Moreover, to better understand the role of political power, economic background and culture in the mechanism of the relationship between driving attitudes and risky behaviours, mediating analysis was also implemented.

First, the SEM was conducted for participants with political power background. Next, the SEM was conducted for participants who reported not having parents/close relatives with political power. Regarding the SEM analysis for this group of participants, the political background sub-scales were not applied. Additionally, the SEM was conducted for all participants in order to check potential mediators among cultural variables.

The mediation analysis was conducted for all participants after the model was identified, and the potential mediating effects of significant factors between driving attitudes and risky behaviours were checked. Because of the strong bivariate relationships with attitude and behaviour sub-scales, 4 culture sub-scales were applied in the mediating relationship test along with economic background sub-scales. All the analyses discussed above were conducted using Mplus version 7.11.

### **4.6.1 SEM analysis for participants whose parents/close relatives hold political power**

Figure 1 shows the tested SEM path diagram of the relationship between driving attitude, risky behaviour, economic background and political background sub-scales for participants whose parents/close relatives hold political power. The path model explains 73.1% of the total variance in risky behaviours. The root mean square error

of approximation (RMSEA) is .065, which is considered as a fair fit [92]; the standardised root mean square residual (SRMR) is .066, which is also considered acceptable [93]. Attitudes towards risky driving was significantly and positively correlated with risky behaviours ( $\beta = .812$ ,  $p < .001$ ), which indicates that for participants with political background, those who reported risky attitudes towards driving also reported more risky behaviours. Power Impact shows a significant relationship ( $\beta = .173$ ,  $p = .021$ ) with risky behaviours. This finding suggests that for participants whose parents/close relatives hold political power, the more impacts they reported from that power, the more dangerous behaviours they reported performing. Power Impact is also significantly correlated with Power Benefits ( $r = .548$ ,  $p < .001$ ) and Self-income ( $r = .245$ ,  $p < .001$ ) in the model, which indicated that participants who reported higher impacts from their parents'/close relatives' political power also reported receiving benefits more frequently from this power as well as higher personal income.

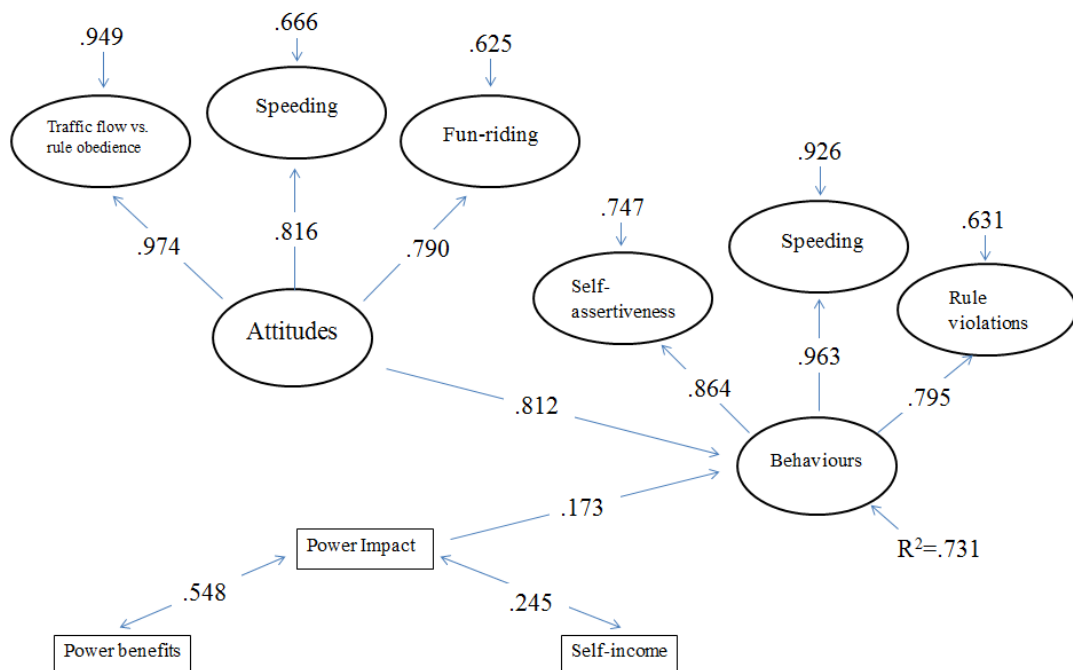


Figure 1 SEM path diagram for participants whose parents/close relatives hold political power

#### **4.6.2 SEM analysis for participants whose parents/close relatives do not hold political power**

Figure 2 shows the tested SEM path diagram of the relationship between driving attitude, risky behaviour and economic background sub-scales for participants whose parents/close relatives do not hold political power. The path model explained 84.5% of the total variance in risky behaviours, which was more than that of the political group above. The RMSEA value of this model was .066, which was considered as a fair fit [92]; the SRMR value of this model was .058, which was also considered acceptable [93]. Attitudes towards risky driving was significantly and positively correlated with risky behaviours ( $\beta = .917, p < .001$ ), which indicated that for participants without political background, those who reported risky attitudes towards driving also reported more risky behaviours. Self-income shows a significant relationship ( $\beta = .095, p = .020$ ) with risky behaviours. This finding indicates that for participants whose parents/close relatives do not hold political power, they reported performing risky behaviours more often as their personal income increased. Self-income was also significantly correlated with Parents' income ( $r = .307, p < .001$ ) in the model, which indicated that participants who reported higher personal incomes also reported higher parental incomes.

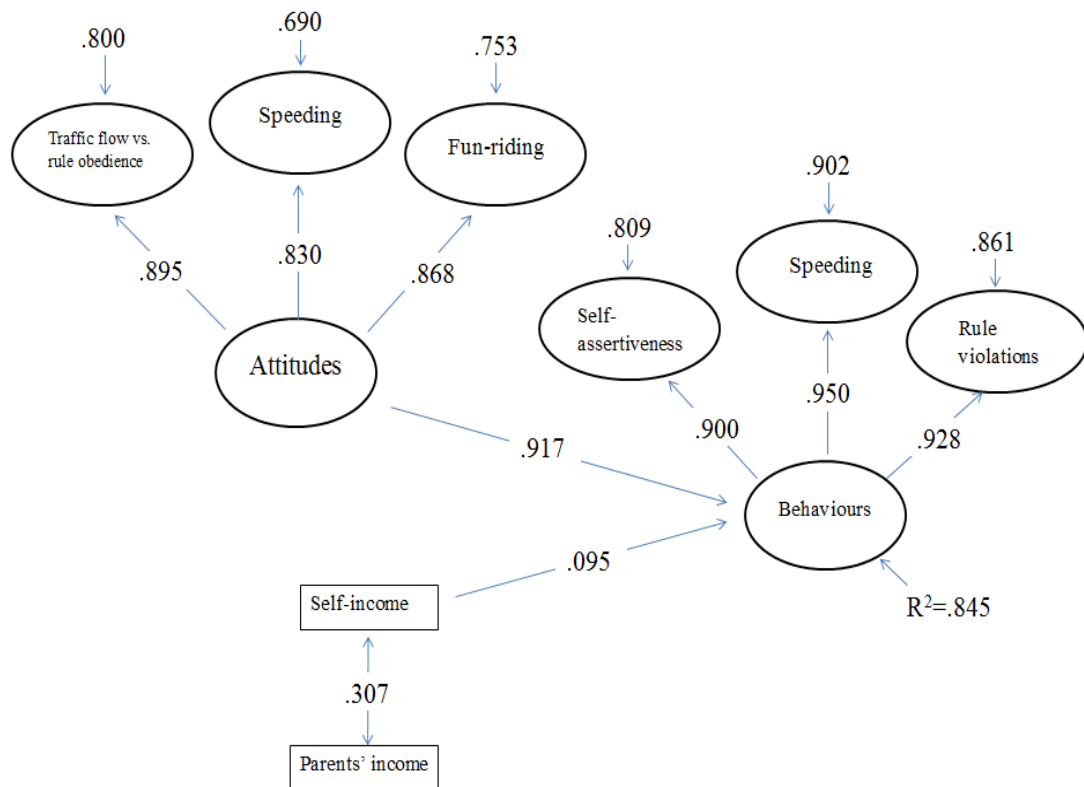


Figure 2 SEM path diagram for participants whose parents/close relatives do not hold political power

#### 4.6.3 SEM and mediating relationship analysis for all participants

As shown in Figure 3, the SEM model for all participants explained 83.0% of the total variance in risky behaviours. The RMSEA value of this model was .054, which was considered as a fair fit [92]; the SRMR value of this model was .082, which was very close to the cut-off value (.08) so that also considered acceptable [93]. Attitudes towards risky driving was significantly and positively correlated with risky behaviours ( $\beta = .786$ ,  $p < .001$ ), which indicated that for the whole sample of participants, those who reported risky attitudes towards driving also reported more risky behaviours. Self-income showed a significant and positive relationship ( $\beta = .070$ ,  $p = .037$ ) with risky behaviours, which indicated that the more risky behaviours participants reported, the higher their personal income. Self-income was also significantly and positively correlated with Parents' income ( $r = .305$ ,  $p < .001$ ), which meant that participants who reported higher personal incomes also reported higher parental incomes.

The mediating relationship test was conducted to check if any of cultural and economic variables were mediating the relationship between driving attitudes and risky behaviours, and two significant mediators were found in the model. The cultural sub-scale, Power Distance, was significantly and positively correlated with driving attitudes ( $\beta = .223, p < .001$ ) and risky behaviours ( $\beta = .144, p < .001$ ). This finding indicated that Power Distance significantly mediated the relationship between driving attitudes and risky behaviours, the more participants reported “being more likely to accept and expect that power was distributed unequally”, the more favourable attitudes towards dangerous driving and the more risky behaviours they reported. This finding for Power Distance is consistent with the finding of a previous cross-country study [41] that reported only Power Distance had a statistically significant and positive correlation with road safety fatality rates. Another cultural sub-scale, Uncertainty avoidance, was significantly and negatively correlated with driving attitudes ( $\beta = -.273, p < .001$ ) and risky behaviours ( $\beta = -.159, p = .001$ ). This finding indicated that Uncertainty avoidance significantly mediated the relationship between driving attitudes and risky behaviours, the more participants reported “not like to cope with anxiety by minimising uncertainty”, the more favourable attitudes towards dangerous driving and the more risky behaviours they reported.



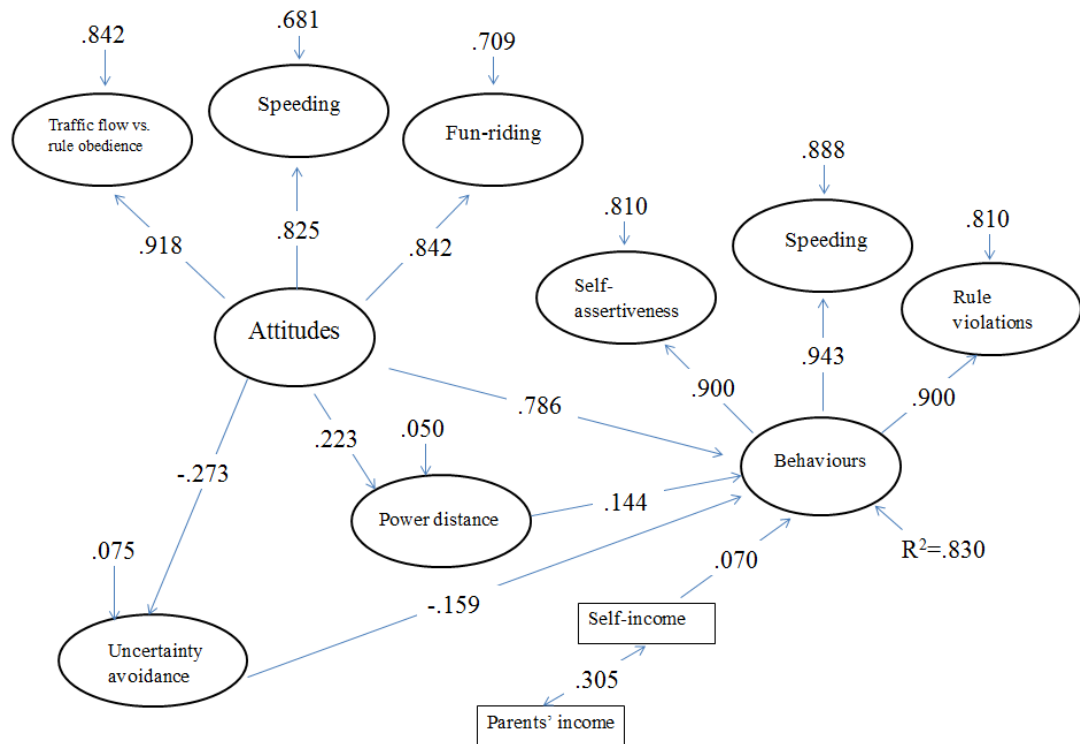


Figure 3 SEM path diagram for all participants

#### 4.7 Support for hypotheses

This section presents the research hypotheses that guided this study, as described in section 2.7, and discusses the level of support found for each.

##### 4.7.1 Hypotheses for all participants in general

*H<sub>1</sub>: Safer driving attitudes will be associated with less risky self-reported driving behaviours.*

The bivariate correlation analysis shows that for all participants, each risky behaviour sub-scale is significantly and positively correlated with each driving attitude sub-scale. The findings of SEM for all participants also indicate that participants who reported safer driving attitudes also reported less risky driving behaviours. Consequently, this hypothesis is supported.

*H<sub>2</sub>: Participants who report a political background will report more dangerous driving attitudes than participants who do not report a political background.*

Independent-samples T-test was employed to check if there is a significant difference of means on three driving attitude sub-scales and three risky behaviour sub-scales using “whether the participant has parents/close relatives who hold political power or not” as the grouping variable. The results show that all t values are not significant. As a consequence, among this sample of Chinese young drivers, “whether the participant has parents/close relatives who hold political power or not” did not appear to influence scores of driving attitude and risky behaviour sub-scales, which means that this hypothesis is not supported.

*H<sub>3</sub>: Younger participants will report more risky driving behaviours than older participants.*

As displayed in the bivariate correlation matrix for all participants in Appendix C, age is not significantly correlated with any of risky behaviour sub-scales. Consequently, this hypothesis is not supported.

*H<sub>4</sub>: Male participants will report more risky driving behaviours than female participants.*

As displayed in the variable correlation matrix for all participants in Appendix C, gender is significantly and negatively correlated with self-assertiveness behaviours ( $r = -.156$ ,  $p = .001$ ), which indicates female participants reported less self-assertiveness behaviours than male participants. As a consequence, this hypothesis is partially supported.

*H<sub>5</sub>: Less driving experience will be associated with more self-reported risky driving behaviours.*

As displayed in the bivariate correlation matrix for all participants in Appendix C, driving experience is not significantly correlated with any of risky behaviour sub-scales. Consequently, this hypothesis is not supported.

*H<sub>6</sub>: Lower levels of education will be associated with more self-reported risky driving behaviours.*

As displayed in the bivariate correlation matrix for all participants in Appendix C, education level is not significantly correlated with any of risky behaviour sub-scales. Consequently, this hypothesis is not supported.

*H<sub>7</sub>: Place of residence (i.e., level of city based on population level) will be associated with self-reported risky driving, such that participants from smaller cities will report more risky driving behaviours.*

As displayed in the bivariate correlation matrix for all participants in Appendix C, resident city level is not significantly correlated with any of risky behaviour sub-scales. Hence, this hypothesis is not supported.

*H<sub>8</sub>: The relationship between driving attitudes and risky behaviours will be mediated by culture.*

Possible mediating relationships were tested while building the SEM model. All the four cultural dimension sub-scales – Power Distance, Uncertainty Avoidance, Masculinity and Collectivism were treated as possible mediating factors. As displayed in Figure 3, Power Distance and Uncertainty Avoidance significantly mediate the relationship between driving attitudes and risky behaviours. Consequently, this hypothesis is partially supported.

#### **4.7.2 Hypotheses for participants whose parents/close relatives hold political power**

*H<sub>9</sub>: For participants with political background, higher personal income will be associated with more risky driving behaviours.*

As displayed in Table 5, Self-income is not significantly correlated with any risky driving behaviour at bivariate level. The SEM findings in Figure 1 also indicate that

there is no significant relationship between Self-income and Risky behaviours. Consequently, this hypothesis is not supported.

*H<sub>10</sub>: For participants with political background, higher parental income will be associated with more risky driving behaviours.*

As displayed in Table 5, Parents' income is significantly and negatively correlated with speeding behaviours. However, the SEM findings in Figure 1 indicate that Parents' income is not significantly correlated with Risky behaviours. As a consequence, this hypothesis is not supported.

*H<sub>11</sub>: The level of political position held by participants' parents/close relatives will influence risky driving behaviours, such that those who report a higher administrative position will also report more risky driving.*

The SEM findings in Figure 1 show that Power Level is not significantly correlated with Risky behaviours. The ANOVA analysis further confirms that Power Level does not significantly influence participants' reported risky behaviours. Consequently, this hypothesis is not supported in this sample of Chinese young drivers.

*H<sub>12</sub>: More risky driving behaviours will be reported among those participants who report more impact in their life from political background.*

As shown in Table 5, Power Impact is significantly and positively correlated with speeding behaviours ( $r = .238$ ,  $p = .003$ ). Additionally, as shown in Figure 1, the SEM analysis also supports this finding that Power Impact is significantly and positively correlated with Risky behaviours ( $\beta = .173$ ,  $p = .020$ ). The ANOVA analysis further supports this finding that Power Impact is significantly and positively associated with speeding behaviours. Consequently, this hypothesis is supported.

*H<sub>13</sub>: More risky driving behaviours will be reported by participants who have benefitted more often from their family political background than those who have benefitted less often.*

As shown in Table 5, Power Benefits is significantly and positively correlated with speeding behaviours ( $r = .227$ ,  $p = .004$ ) and rule violation behaviours ( $r = .175$ ,  $p = .029$ ). The ANOVA analysis further supports this finding that Power Benefits is significantly and positively associated with speeding behaviours. Consequently, this hypothesis is partially supported.

#### **4.7.3 Hypotheses for participants whose parents/close relatives do not hold political power**

*H<sub>14</sub>: For participants without political background, higher personal income will be associated with more risky driving behaviours.*

The SEM findings in Figure 2 indicate that Self-income is significantly and positively correlated with Risky behaviours ( $\beta = .095$ ,  $p = .020$ ). Consequently, this hypothesis is supported.

*H<sub>15</sub>: For participants without political background, higher parental income will be associated with more risky driving behaviours.*

As displayed in Table 6, Parents' income is not significantly correlated with any risky driving behaviour at bivariate level. The SEM findings in Figure 2 also indicate that Parents' income is not significantly correlated with Risky behaviours. Consequently, this hypothesis is not supported.



# Chapter 5: Conclusions and discussion

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This research fills the gap in our understanding of the role of political and economic factors in road safety studies. Although the economic background and political background are hard to change, understanding of relationships between them and road safety can help develop relevant policies, education and training programs to promote road safety among young drivers with an economically or politically powerful family background. This study can potentially draw road safety researchers to focus on new human factors (i.e. economic and political influence factors). The main research findings, their practical implications, limitations, and topics for future research are discussed in this chapter.

## 5.1 Main findings and comparison with previous studies

This study collected participants' self-reported economic and political background information. In order to examine their relationship with attitudes towards risky driving and with self-reported risky driving behaviours, participants were asked to indicate their personal situations in terms of five aspects, including personal income, parents' income, parents'/close relatives' power level (government administrative level), power impact (the extent of political power's impact on participant's life) and power benefits (the frequency that participant benefits from this political power). Additionally, cultural scales [75], personality scales [76] and demographic information were also reported by participants to expand the research comprehensiveness. The sample size is 476, including 305 male participants and 171 female participants, which is close to the ratio of 2:1 in the national census data [77]. Also, the family income status (including the participant and his/her parents) was controlled at the ratio of 4:1:1 for family monthly income 5000-10000, 10000-20000 and more than 20000 (RMB) based on the national census data for the general Chinese population [71]. In order to find the similarities and differences between participants with and without political background, analyses were divided into two sections: one set of analyses was conducted for the group of participants who

reported political background (N = 156, 32.8%), and the other set was conducted for participants without political background (N = 320, 67.2%).

The findings from SEM analysis indicate that for participants with political background, those participants who reported more impact in their life from political background also reported more risky driving behaviours. Additionally, participants who reported more impact in their life from political background also reported benefitting more often from their family political background. Besides, participants who reported more impact in their life from political background also reported higher personal income, which is probably because participants with political background can get more and better job opportunities with the help from this power. For participants without political background, the findings of SEM analysis indicate that participants who reported higher personal income also reported more risky driving behaviours. This finding is consistent with previous studies [31] [33] that reported young drivers with higher personal incomes might be more likely to disobey traffic rules. Meanwhile, those who reported higher personal income also reported higher parental income.

Consistent results have been obtained from ANOVA analysis. These findings are consistent with the public perception in China that those young drivers from rich families or with a political family background are more likely to be involved in road crashes [29] [30].

When examining mean scores on the attitudinal and behavioural measures across the sub-groups of participants who reported or did not report political background, no differences were found on self-reported driving attitudes or risky behaviours. However, for the participants with political background, the ANOVA analysis reveals that Power Impact and Power Benefits are likely to influence participants' self-reported attitudes towards speeding and their speeding behaviour. More specifically, participants who reported more impact in life from political power also reported more often speeding behaviours, and participants who reported benefiting more often from the political power also reported more risky attitude towards



speeding and more often speeding behaviours. This finding is consistent with conclusions from SEM analysis (discussed above), and with the fact that the main reason of the crashes caused by Chinese young drivers with a political family background is speeding [29].

Besides economic and political background factors, some additional factors were also investigated to develop a better understanding of issues relating to road safety issues among Chinese young drivers, including culture factors and demographic factors.

Regarding culture factors, participants who were “more likely to accept and expect that power was distributed unequally” (Power Distance) and who preferred cultural values such as “competitiveness, assertiveness, materialism, ambition and power” (Masculinity) reported more favourable attitudes towards unsafe driving and more risky behaviours, irrespective of political or economic background, while participants who liked to be “integrated into groups” (Collectivism) and attempted to “cope with anxiety by minimising uncertainty” (Uncertainty Avoidance) reported less favourable attitudes towards unsafe driving and less risky behaviours. The SEM analysis for all participants further confirmed the findings of Power Distance and Uncertainty Avoidance sub-scales. The finding in the current research of Power Distance is also in line with previous research, for instance, [41] reported that people are more likely involved in road crash fatalities in countries reporting a higher degree of unequally distributed power than people in other countries.

There are also many differences between participants with and without political background in terms of demographic factors. For participants without political background, younger drivers reported breaking laws to keep traffic flow more often than older drivers, while age seemed to have no significant correlations with any attitude or behaviour sub-scales for participants with political background. Similar results were found for driving experience: for participants without political background, less driving experience was associated with breaking rules to keep traffic flow more often. However, no possible significant correlation with attitude

and behaviour sub-scales was found for participants with political background. One possible interpretation of this finding is that young drivers with a powerful family background can seek for shield from the political power. Consequently, they are less likely to experience penalties for breaking traffic laws, and therefore they are less likely to alter their bad driving behaviours as they become older or as they drive more. In terms of gender, female drivers reported more favourable attitudes towards safe driving and less risky behaviours for both groups (i.e., with and without a powerful family background), which is in line with findings of previous studies [57] [58].

## **5.2 Practical implications of research findings**

Based on the findings for participants with political background, we can conclude that participants from political families reported more risky driving behaviours as they reported more impact in their life from political background. Regarding participants from non-political families, they reported more risky driving behaviours as they reported higher parental income. These findings are not surprising because in the contemporary Chinese society, it is not a secret that the second generation of people with economic or political power can relatively easily escape would-be-deserved punishments of their bad driving behaviours because consequences from road crashes caused by them can often be handled and resolved privately because of their parents' interference. This finding explains why Chinese young drivers involving in road crashes are disproportionally from rich families or families with a political background.

In terms of three political background factors that were developed specifically to be applied in this study, the SEM analysis results indicate that participants who reported more impact in their life from political background also reported more often risky driving behaviours. However, there is no direct significant association between Power Level and risky behaviours, or between Power Benefits and risky behaviours. One possible explanation is that reporting the level of parents'/close relatives' political position is objective, while reporting of the impact of that power on their life is a subjective perception, which may be more related to behaviours. Another

potential explanation is that participants were not specifically asked if they had benefited in relation to driving but just broadly. Therefore, their ideas of benefiting may not relate to avoiding traffic penalties at all. In addition, the Chinese government is determined to stamp corruption out of contemporary Chinese society with strict measures in recent years. A number of high-profile (former) government officials have been arrested and jailed because of corruption and power abuse [94], which intuitively alerts some government officials who would have behaved differently to more cautiously self-inspect and self-discipline their behaviours. Moreover, the Central Disciplinary Inspection Team has issued a warning that any rule-violating activities of a government official's family member should be treated as an important information source that may lead to an anti-corruption investigation on the government official himself or herself [95], which can also prompt some government officials to warn and monitor their family members to behave themselves. Indeed, some fatal road crashes caused by government officials' children have led the government to investigate these officials' own behaviours [29] [96] after the mass media and the public have revealed and subsequently scrutinised offenders' family background. Thus, participants of our survey with political family background may have been instructed by their parents not to break any public rules because of the need to protect their parents' reputation, and the fear of any bad behaviour leading their parents to become a subject of the current anti-corruption campaign.

The analysis also shows that higher-educated young drivers with political background reported favourable attitudes towards driving safely, while the correlation is not significant for participants without political background. This finding may point out a way of decreasing the road crash rate for participants with political background, which is to strengthen road safety education not only in driver training schools, but also in universities (maybe even in senior-high schools before they reach the minimum age requirement of applying for a driving license).

Regarding driving hours, for those participants without a political background, more favourable attitudes towards safer driving and more self-reported safe driving behaviours are associated with an increased number of driving hours per week. However, this association is not present among participants who have a political

background. As discussed above, this finding further highlights the importance of ensuring that offenders receive full penalties if they break traffic laws, no matter they have a political background or not.

In terms of place of residence for all participants, participants from smaller cities reported more favourable attitudes towards breaking laws to keep traffic flowing and to fun-riding. This finding may be explained by that smaller cities usually have fewer police enforcement resources than larger cities, which may encourage drivers in smaller cities to break traffic rules more often. As the levels of police enforcement has been shown to influence drivers' compliance with traffic laws [97], more work needs to be done in China to better understand the relationship between levels of policing and levels of drivers' compliance with traffic rules.

### **5.3 Limitations of the research**

As a pioneering road safety research project studying family background factors for Chinese young drivers, some limitations when conducting this research are acknowledged. First, all data were self-reported by participants. Most questions in the questionnaire asked about personal opinions towards something, which may cause a social desirability bias inflating individual responses. As a new wave of anti-corruption measures have been applied within each level of the Chinese government sectors in recent years, government officials and their family members may be really trying to behave decently in order not to attract any attention from the media or the public [98]. Similarly, it is possible that participants with political background answered these questions in a biased way to prevent their parents from trouble, despite it was emphasised that any responses were anonymous.

Meanwhile, the economic and political background sub-scales were developed specifically for this research and had not previously been validated. As there is no previous road safety research investigating the impact of political power on driving attitudes and behaviours, it is impossible to compare findings of this research with the literature. More validation work on these items needs to be conducted to improve their quality for future research. Additionally, the most updated data on the National

Bureau of Statistics website about people's income status that have been applied in this study are for 2012, and data for 2013, 2014 and 2015 are still unavailable on this most authoritative website in China. Previous research also questioned validity of the fifth dimension of Hofstede's theory, and its practice was found to be very limited because of its inherent flaws in conceptualisation [99]. Furthermore, in terms of personality scales, although all 5 dimensions are significantly and negatively correlated with almost all driving attitude and risky behaviour sub-scales, only the validity of using Extraversion, Emotional stability and Conscientiousness in predicting driving behaviours were supported in previous research [47] [48] [49]. Consequently, the findings of significant relationships between Agreeableness, Openness and risky behaviours need to be further confirmed in future research.

#### **5.4 Future research directions**

As very few studies have investigated economic and political backgrounds' impact on road safety, future research is needed to further validate findings in this thesis.

Meanwhile, analysis of this study shows that cultural factors likely contribute more in predicting risky behaviours than demographic factors such as age and gender. Additionally, Power Distance and Uncertainty Avoidance significantly mediate the relationship between driving attitudes and risky behaviours. Thus, besides family background factors, culture's influence on road safety among Chinese young drivers needs to be further investigated. In addition, as most previous road safety research focusing on cultural factors were conducted at country level, this study demonstrated a feasible way of investigating cultural influences at individual level, which can be further developed in future research.

In summary, a study focusing on social factors' influence on road safety performances of Chinese novice drivers is desired to further investigate their potential connections.



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# Appendices

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## Appendix A

### Questionnaire

A research team from Queensland University of Technology, Australia, is conducting a study for measuring possible relationships between Chinese young drivers' behaviours and attitudes towards the prevention of road safety issues and their economic background, political background, culture, personality traits and demographics. It is our pleasure that you could be one of our respondents, and every of your answers plays a big role in this study, as all of them together constitute the data sample of our further statistical analysis. The survey will take you approximately 12-15 minutes to complete, and we really thank you for your time on it.

The study will be conducted for research purposes only, and no attempt will be made to sell you anything at any time. Your participation is entirely voluntary. All comments and responses are anonymous and will be treated confidentially. Data from this survey will be saved on secure servers for possible further research. If you have any concerns or enquiries, please feel free to contact the corresponding researcher, Zhe Wang, email: [z25.wang@qut.edu.au](mailto:z25.wang@qut.edu.au).

\*Please choose **one answer only** for all questions below.

### SCREENING QUESTIONS

(Estimated workload: 1 minute)

SQ1. What is your age?

- (1) Younger than 18 years (**Survey closed**)
- (2) 18-20 years
- (3) 21-23 years
- (4) 24-26 years
- (5) 27-28 years
- (6) Older than 28 years (**Survey closed**)

SQ2. How long is your driving experience?

- (1) None (**Survey closed**)
- (2) Less than or equal to one year
- (3) More than one year but no more than three years
- (4) More than three years but no more than five years
- (5) More than five years but no more than ten years

(6) More than ten years

SQ3. Which driver type are you in for general cases?

(1) Private car

(2) Van **(Survey closed)**

(3) Truck **(Survey closed)**

(4) Taxi **(Survey closed)**

(5) Bus **(Survey closed)**

(6) Other **(Survey closed)**

## DRIVING ATTITUDES

(Estimated workload: 2-3 minutes)

The questions in this section ask for information on your attitudes towards driving.

Each item in this section is answered by choosing one of the following options: (1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

DR1. There are many traffic rules which cannot be obeyed in order to keep up the traffic flow.

DR2. Sometimes it is necessary to bend the rules to keep traffic going.

DR3. It is more important to keep up the traffic flow rather than always follow the traffic rules.

DR4. It is better to drive smoothly than always follow the traffic rules.

DR5. Sometimes it is necessary to break the traffic rules in order to get ahead.

DR6. Sometimes it is necessary to ignore violations of traffic rules.

DR7. Sometimes it is necessary to take chances in the traffic.

DR8. Sometimes it is necessary to bend the traffic rules to arrive in time.

DR9. A person who takes chances and violates some traffic rules is not necessarily a less safe driver.

DR10. If you have good skills, speeding is OK.

DR11. I think it is OK to speed if the traffic conditions allow you to do so.

DR12. Driving 10 or 15 km/h above the speed limit is OK because everyone does it.

DR13. If you are a safe driver, it is acceptable to exceed the speed limit by 10 km/h on highways.

DR14. It is acceptable, when driving on a highway, to exceed the speed limit by 10km/h if there are no other vehicles nearby.

DR15. Adolescents have a need for fun and excitement in traffic.

DR16. Speeding and excitement belong together when you are driving.

DR17. To me, speeding while driving is fun.

## **RISKY BEHAVIOURS**

(Estimated workload: 2-3 minutes)

The questions in this section ask for your frequencies on risky behaviours while driving.

Each item in this section is answered by choosing one of the following options: (1) Never (2) Rarely (3) Sometimes (4) Often (5) Very often

- RI1. I drive recklessly because others expect me to do it.
- RI2. Drive fast to show others that I am tough enough.
- RI3. Drive fast to show others I can handle the car.
- RI4. Break traffic rules due to peer pressure.
- RI5. Drive fast because the opposite sex enjoys it.
- RI6. Exceed the speed limit in build-up areas (by more than 10 km/h)
- RI7. Exceed the speed limit on country roads (by more than 10 km/h)
- RI8. Overtake the car in front when it is driving at the speed limit.
- RI9. Drive too close to the car in front.
- RI10. Bend the traffic rules in order to get ahead in traffic.
- RI11. Ignore traffic rules in order to get ahead in traffic.
- RI12. Drive on a yellow light when it is about to turn red.
- RI13. Disregard red light on an empty road.
- RI14. Drive the wrong way down a one-way street.

## **CULTURE**

(Estimated workload: 3-4 minutes)

The questions in this section ask for your opinions related to culture.

Each item in this section is answered by choosing one of the following options: (1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

- CU1. Managers should make most decisions without consulting subordinates.
- CU2. It is frequently necessary for a manager to use authority and power when dealing with subordinates.
- CU3. Managers should seldom ask for the opinions of employees.
- CU4. Employees should not disagree with management decisions.
- CU5. Managers should not delegate important tasks to employees.
- CU6. It is important to have job requirements and instructions spelled out in detail so that employees always know what they are expected to do.

- CU7. Managers expect workers to closely follow instructions and procedures.
- CU8. Rules and regularities are important because they inform workers what the organisation expects of them.
- CU9. Standard operation procedures are helpful to employees on the job.
- CU10. Instructions for operations are important for employees on the job.
- CU11. Meetings are usually run more effectively when they are chaired by a man.
- CU12. It is more important for men to have a professional career than it is for women to have a professional career.
- CU13. Men usually solve problems with logical analysis; women usually solve problems with intuition.
- CU14. Solving organisational problems usually require an active, forcible approach which is typical for men.
- CU15. It is preferable to have a man in a high level position rather than a woman.
- CU16. Group welfare is more important than individual rewards.
- CU17. Group success is more important than individual success.
- CU18. Being accepted by the members of your workgroup is very important.
- CU19. Employees should pursue their goals after considering the welfare of the group.
- CU20. Ordering relationships by status and observing this order is important in the workplace.
- CU21. Thrift is important in the workplace.
- CU22. Persistence is important in the workplace.
- CU23. Having a sense of shame is important in the workplace.

## **PERSONALITY**

(Estimated workload: 1-2 minutes)

The questions in this section ask you to identify diverse aspects of your characters based on daily actions.

Each item in this section is answered by choosing one of the following options: (1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

### **I see myself as someone who is...**

- PE1. Extraverted and enthusiastic
- PE2. Critical and quarrelsome
- PE3. Dependable and self-disciplined
- PE4. Anxious and easily upset

PE5. Open to new experiences and complex

PE6. Reserved and quiet

PE7. Sympathetic and warm

PE8. Disorganised and careless

PE9. Calm and emotionally stable

PE10. Conventional and uncreative

## **ECONOMIC BACKGROUND**

(Estimated workload: 1-2 minutes)

The questions in this section ask for information on your economic background.

EC1. What is your monthly pre-tax income? (Chinese yuan)

- (1) No more than 2500
- (2) More than 2500 but no more than 5000
- (3) More than 5000 but no more than 7500
- (4) More than 7500 but no more than 10000
- (5) More than 10000 but no more than 20000
- (6) More than 20000 but no more than 50000
- (7) More than 50000

EC2. What is your parents' monthly pre-tax income?

- (1) No more than 5000
- (2) More than 5000 but no more than 10000
- (3) More than 10000 but no more than 15000
- (4) More than 15000 but no more than 20000
- (5) More than 20000 but no more than 40000
- (6) More than 40000 but no more than 100000
- (7) More than 100000

EC3. What is the type of your job?

- (1) Principal of government offices, party organisation, enterprise and public institutions
- (2) Professionals
- (3) Clerks
- (4) Commerce and customer service
- (5) Production personnel for agriculture, forestry, stock raising, fishery and water conservancy
- (6) Operating personnel for production and delivery equipment
- (7) Army personnel
- (8) Others
- (9) I have no job currently.

EC4. What is the type of your father's job?

- (1) Principal of government offices, party organisation, enterprise and public institutions
- (2) Professionals
- (3) Clerks
- (4) Commerce and customer service
- (5) Production personnel for agriculture, forestry, stock raising, fishery and water conservancy
- (6) Operating personnel for production and delivery equipment
- (7) Army personnel
- (8) Others
- (9) Retired/unemployed currently

EC5. What is the type of your mother's job?

- (1) Principal of government offices, party organisation, enterprise and public institutions
- (2) Professionals
- (3) Clerks
- (4) Commerce and customer service
- (5) Production personnel for agriculture, forestry, stock raising, fishery and water conservancy
- (6) Operating personnel for production and delivery equipment
- (7) Army personnel
- (8) Others
- (9) Retired/unemployed currently

## **POLITICAL BACKGROUND**

(Estimated workload: 1-2 minutes)

The questions in this section ask for information on the political status held by your parents and close relatives (if any).

PO1. Do your parents or close relatives hold a political status?

- (1) Yes (GO TO PO2)
- (2) No (GO TO DE1)

PO2. What is the administrative level of his/her position?

- (1) Director of an institute (suo zhang)
- (2) Section chief (ke zhang)
- (3) Division head (chu zhang)
- (4) Head of a department (ting zhang) and above

PO3. What is the impact of your parents'/close relatives' political power on your life?

- (1) No impact
- (2) Little impact
- (3) Some impact
- (4) Large impact
- (5) Not sure

PO4. Have you been benefited from your parents'/close relative's political power?

- (1) Never
- (2) Rarely
- (3) Sometimes
- (4) Often
- (5) Always

## DEMOGRAPHICS

(Estimated workload: 1-2 minutes)

The questions in this section ask for information on your background.

DE1. What is your gender?

- (1) Male
- (2) Female

DE2. What is your highest education level?

- (1) Primary school
- (2) Junior high school
- (3) Senior high school
- (4) Undergraduate degree
- (5) Master degree
- (6) PhD degree
- (7) Other (Please specify \_\_\_\_\_)

DE3. What is the name of the city/town/village that your usual residency is located?

Please specify \_\_\_\_\_

DE4. How many traffic tickets have you received in the last year?

- (1) 0
- (2) 1
- (3) 2
- (4) 3
- (5) 4
- (6) 5 or more than 5

DE5. How many hours do you usually drive per week?

- (1) No more than 5 hours
- (2) More than 5 hours but no more than 10 hours
- (3) More than 10 hours but no more than 20 hours
- (4) More than 20 hours

Do you want to know the outcome of this research?

- (1) Yes, and I would like to receive a summary report from the research team when it has been finalised

(2) No

Thanks a lot for your participation! Please drive safety, and best wishes to you and your families!



## Appendix B

*Table B. 1 Screening question survey results*

Driver's age (years)	18-20	21-23	24-26	27-28	
Proportion (%)	2.9	14.7	45.4	37.0	
Driving experience (years)	≤1	1-2.99	3-4.99	5-9.99	>10
Proportion (%)	19.1	47.7	27.5	5.7	0
Driver type	Private car	Van	Truck	Taxi	Bus
Proportion (%)	100.0	0	0	0	0

*Table B. 2 Original number of items, mean scores and Cronbach's alpha for scales of Driving Attitudes, Risky Behaviours and Culture*

Scales	Number of items	Mean (range 1-5)	S.D.	Cronbach's alpha
<i>Driving Attitudes</i>				
Traffic flow vs. rule obedience	9	2.26	0.66	0.850
Speeding	5	2.35	0.81	0.864
Fun-riding	3	2.24	0.81	0.704
<i>Risky Behaviours</i>				
Self-assertiveness	5	1.87	0.66	0.842
Speeding	6	2.00	0.65	0.847
Rule violations	3	1.79	0.64	0.672
<i>Culture</i>				
Power distance	5	2.95	0.56	0.619
Uncertainty avoidance	5	4.03	0.52	0.778
Masculinity	5	3.20	0.77	0.851
Collectivism	4	4.00	0.60	0.783
Long-term orientation	4	3.74	0.50	0.493



## Appendix C

*Table C. 1 Bivariate correlation matrix for all participants (part 1). N = 476*

	Age	Driving experience	<i>Driving attitudes</i>		<i>Risky behaviours</i>			
			Traffic flow vs. rule obedience	Speeding	Fun-riding	Self-assertiveness	Speeding	Rule violations
Age	1.000							
Driving experience	.378**	1.000						
<i>Driving attitudes</i>								
Traffic flow vs. rule obedience	-.122**	-.164**	1.000					
Speeding	-.016	-.081	.643**	1.000				
Fun-riding	-.066	-.101*	.581**	.572**	1.000			
<i>Risky behaviours</i>								
Self-assertiveness	-.019	-.054	.568**	.484**	.543**	1.000		
Speeding	-.035	-.024	.639**	.644**	.528**	.658**	1.000	
Rule violations	.025	-.021	.499**	.428**	.379**	.598**	.570**	1.000
<i>Culture</i>								
Power distance	.134**	.083	.083	.185**	.117*	.140**	.197**	.125**

Uncertainty avoidance	.136**	.140**	-.256**	-.164**	-.227**	-.349**	-.254**	-.260**
Masculinity	.072	.054	.234**	.228**	.246**	.218**	.235**	.149**
Collectivism	.149**	.184**	-.277**	-.232**	-.176**	-.261**	-.286**	-.321**
<i>Personality</i>								
Extraversion	.086	.234**	-.172**	-.155**	-.087	-.123**	-.160**	-.188**
Agreeableness	.092*	.122**	-.409**	-.291**	-.311**	-.408**	-.369**	-.295**
Conscientiousness	.150**	.194**	-.330**	-.229**	-.232**	-.328**	-.318**	-.339**
Emotional stability	.189**	.286**	-.394**	-.251**	-.271**	-.326**	-.309**	-.351**
Openness to experiences	.109*	.243**	-.184**	-.138**	-.090	-.132**	-.189**	-.169**
Self-income	.419**	.505**	-.141**	-.066	-.114*	-.039	-.059	.003
Parents' income	.053	.166**	-.031	-.025	-.037	.032	.010	.010
Gender	-.015	-.067	-.141**	-.088	-.166**	-.156**	-.060	-.051
Education level	.163**	.081	-.096*	-.114*	-.123**	-.048	-.088	-.023
City	.146**	.203**	-.120**	-.040	-.095*	-.070	-.052	.028
Tickets	.152**	.191**	.077	.097*	.104*	.173**	.155**	.152**
Hours	.254**	.318**	-.122**	-.090*	-.025	-.071	-.118*	-.065

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table C. 2 Bivariate correlation matrix for all participants (part 2). N = 476

	<i>Culture</i>		<i>Personality</i>						
	Power distance	Uncertainty avoidance	Masculinity	Collectivism	Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness to experiences
<i>Culture</i>									
Power distance	1.000								
Uncertainty avoidance	.292**	1.000							
Masculinity	.295**	.151**	1.000						
Collectivism	.172**	.518**	.161**	1.000					
<i>Personality</i>									
Extraversion	.047	.172**	-.050	.316**	1.000				
Agreeableness	-.068	.330**	-.131**	.304**	.169**	1.000			
Conscientiousness	.064	.417**	-.036	.368**	.268**	.459**	1.000		
Emotional stability	.149**	.388**	-.023	.433**	.453**	.387**	.536**	1.000	
Openness to experiences	.039	.182**	-.090	.273**	.501**	.251**	.322**	.292**	1.000
Self-income	.168**	.177**	.076	.246**	.238**	.101*	.194**	.322**	.197**

Parents' income	.061	-.020	-.007	.006	.099*	.041	.080	.117*	.187**
Gender	-.023	.076	-.272**	.002	-.041	.098*	.011	.008	-.006
Education level	.104*	.086	-.024	.085	.089	.071	.063	.123**	.121**
City	.124**	.080	.045	.060	.081	.054	.105*	.138**	.148**
Tickets	.171**	.016	.092*	.073	.199**	-.017	.030	.121**	.136**
Hours	.116*	.172**	.049	.172**	.259**	.149**	.238**	.278**	.212**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table C. 3 Bivariate correlation matrix for all participants (part 3). *N* = 476

	Self-income	Parents' income	Gender	Education level	City	Tickets	Hours
Self-income	1.000						
Parents' income	.294**	1.000					
Gender	-.208**	.012	1.000				
Education level	.196**	.093*	.002	1.000			
City	.372**	.156**	-.030	.154**	1.000		
Tickets	.200**	.139**	-.055	.051	.155**	1.000	
Hours	.427**	.233**	-.137**	.169**	.221**	.219**	1.000

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

*Table C. 4 Summary of relationships between driving attitudes, risky behaviours and all predictive factors for participants with and without political background*

Factors	Participants with political background	Participants without political background
Self-income	/	Traffic flow vs. rule obedience (-)
Parents' income	Fun-riding (-) Speeding behaviour (-)	/
Power level	/	NA
Power impact	Speeding behaviour (+) Speeding attitude (+)	NA
Power benefits	Speeding behaviour (+) Rule violations (+)	NA
<i>Culture</i>		
Power distance	Speeding attitude (+) Self-assertiveness (+) Speeding behaviour (+) Rule violations (+) Traffic flow vs. rule obedience (-)	Speeding attitude (+) Fun-riding (+) Self-assertiveness (+) Speeding behaviour (+) Traffic flow vs. rule obedience (-)
Uncertainty avoidance	Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-) Traffic flow vs. rule obedience (+)	Speeding attitude (-) Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-) Traffic flow vs. rule obedience (+)
Masculinity	Speeding attitude (+) Fun-riding (+) Self-assertiveness (+) Speeding behaviour (+) Rule violations (+)	Speeding attitude (+) Fun-riding (+) Self-assertiveness (+) Speeding behaviour (+) Rule violations (+) Traffic flow vs. rule obedience (-)
Collectivism	Speeding attitude (-) Rule violations (-)	Speeding attitude (-) Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-)

		Rule violations (-)
<i>Personality</i>		
		Traffic flow vs. rule obedience (-)
Extraversion	Traffic flow vs. rule obedience (-) Speeding attitude (-)	Speeding attitude (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-)
		Traffic flow vs. rule obedience (-)
Agreeableness	Traffic flow vs. rule obedience (-) Speeding attitude (-) Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-)	Traffic flow vs. rule obedience (-) Speeding attitude (-) Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-)
		Traffic flow vs. rule obedience (-)
Conscientiousness	Traffic flow vs. rule obedience (-) Speeding attitude (-) Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-)	Traffic flow vs. rule obedience (-) Speeding attitude (-) Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-)
		Traffic flow vs. rule obedience (-)
Emotional stability	Traffic flow vs. rule obedience (-) Speeding attitude (-) Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-)	Traffic flow vs. rule obedience (-) Speeding attitude (-) Fun-riding (-) Self-assertiveness (-) Speeding behaviour (-) Rule violations (-)
		Traffic flow vs. rule obedience (-)
Openness to experiences	Traffic flow vs. rule obedience (-) Speeding attitude (-) Self-assertiveness (-) Speeding behaviour (-)	Traffic flow vs. rule obedience (-) Speeding attitude (-) Speeding behaviour (-) Rule violations (-)
Age	/	Traffic flow vs. rule obedience (-)
Gender	Traffic flow vs. rule obedience (-) Fun-riding (-)	Fun-riding (-) Self-assertiveness (-)



	Self-assertiveness (-)	
Driving experience	/	Traffic flow vs. rule obedience (-)
	Traffic flow vs. rule obedience (-)	
Education level	Speeding attitude (-) Fun-riding (-)	/
	Speeding behaviour (-)	
City level	/	/
	Traffic flow vs. rule obedience (+)	
Tickets	Speeding attitude (+) Fun-riding (+) Speeding behaviour (+) Rule violations (+)	Self-assertiveness (+) Speeding behaviour (+) Rule violations (+)
		Traffic flow vs. rule obedience (-)
Driving hours	/	Speeding attitude (-) Speeding behaviour (-) Rule violations (-)

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Notes: (+) significant and positive correlation.  
(-) significant and negative correlation.  
/: no significant correlation.  
NA: not applicable.