



# Motivating small-displacement car purchasing in China



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## ABSTRACT

Due to the rapid development of the automobile industry and the ever-increasing quantities of produced and sold automobiles in China, many problems such as fuel scarcity and air pollution have emerged. To alleviate such problems, one solution is to promote households to purchase small-displacement (engine) cars (SDCs). Based on the theory of planned behavior, we develop a theoretical framework to examine how influencing factors such as environmental attitude, subjective norm, self-image and environmental knowledge motivate SDC purchasing behavior through SDC purchasing intention in China. We further extend the research framework to examine whether the factor of economic incentives moderates the relationships between SDC purchasing intention and behaviors. Using an empirical study with 232 usable questionnaire responses, we observe that SDC purchasing intention partly mediates the relationship between three of four influencing factors (environmental attitude, self-image, environmental knowledge) and SDC purchasing behavior. Statistical results also show that the factor of economic incentives moderates the relationship between SDC purchasing intention and behavior. Our results indicate that three of four influencing factors can yield SDC purchasing behavior, especially when SDC purchasing intention exists. Economic incentives such as financial support from the government could promote SDC purchasing intention to transform into purchasing behavior.

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## 1. Introduction

Over the past decade, the automobile industry in China has grown rapidly. In 2012, China produced 19.27 million and sold 19.30 million automobiles, exceeding the number produced and sold in 2011 by 4.6% and 4.3%, respectively. Among these automobiles, 15.52 million passenger automobiles were produced and 15.49 million were sold (China Association of Automobile Manufacture (CAAM, 2013). China has become the largest producer of passenger automobiles in the world. Furthermore, by the end of 2012, the total number of family in-use automobiles was 120.89 million, 14.3% more than at the end of 2011 (Li, 2013). Based on the forecasting study by the International Organization of Motor Vehicle Manufacturers (OICA), the number of family automobiles in China will reach 200 million by the year 2020 (The Xinhua News Agency, 2010), which will dramatically promote the economic development of China and play a very important role in the social progress of China.

However, the rapid development of the automobile industry and the ever-increasing quantities of produced and sold automobiles in China have also resulted in many problems such as fuel consumption, environment pollution and traffic jams. The amount of petroleum consumed by automobiles in 2011 was 140 million tons, accounting for 46% of the total amount of

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petroleum consumed by the entire country (Gao, 2012), which also resulted in serious air pollution. According to statistics by the National Environmental Protection Ministry, automobile exhaust has become the largest source of air pollution in medium-sized and large cities in China, and the air quality in 38 Chinese cities was below the national standard in 2009. Some cities suffered serious haze for more than 200 days in 2010 (Zhang, 2011). Air pollution has already introduced serious threats to the health of local residents. Thus, the Chinese central government has tried to encourage people to purchase small-displacement (engine) cars (SDCs) with low fuel consumption, low pollutant emission and small engine size (lower than 1.6-l passenger car) (Chen, 2012).

With the increasing income of citizens, however, more and more households will purchase automobiles, and many of them still prefer to buy a relatively larger car if they can afford it. According to Xu's study (2012), luxury in-use cars account for more than 8.5% of the total in-use cars (only 2% in Japan). The numbers of sport utility vehicles (SUV) and large cars were still rapidly increasing by 20% in 2012. Thus, determining how to motivate Chinese people to buy SDCs has become extremely important.

In this paper, we aim to understand how to motivate people to buy SDCs when they decide to buy a new car. Many studies have found that purchasing behaviors are determined by purchasing intention, influencing factors and external conditions (Ajzen, 1985, 1991; Mullan et al., 2013; Lane and Potter, 2007; Roberts, 1996; Cleveland et al., 2005). Thus, we applied the theory of planned behavior (TPB) to develop a conceptual model to examine how influencing factors give rise to SDC behavior through SDC purchasing intention. We further extend the model to examine the moderation effect of economic incentives on the relationship between SDC intention and behavior.

To complete this investigation, this paper begins by outlining the theoretical framework of this study and formulating hypotheses in Section 2. In Section 3, we discuss questionnaire development and the data collection methods and measures used in this research. The methodology and results are presented in Section 3. Section 4 discusses the results and implications, and conclusions are presented in Section 5.

## 2. Theoretical framework and hypotheses development

### 2.1. Theoretical framework

The theory of planned behavior (TPB) asserts that individuals' specific behaviors are determined by their intentions, and such behavioral intention can be predicted by the influencing factors of environmental attitude toward behavior (ENAT), subjective norm (SUNM) and perceived behavior control (Ajzen, 1985, 1991). The TPB has been applied in many specific behavior studies. For example, Lo et al. (2014) used the TPB to study office energy-saving behaviors, and Fred et al. (2014) combined innovation theory and the TPB to study the influencing factors of information systems. Taylor and Todd (1995) established a conceptual framework of municipal solid waste recycled behavior based on the TPB. However, Mullan et al. (2013) proposed that large proportions of variance are unaccounted for by the TPB model. Choo and Mokhtarian (2004) and Lane and Potter (2007) further confirmed that self-image (SEIM) and environmental knowledge (ENKN) are also very important factors influencing car-purchasing behavior. In China, car selling is entrusted to car dealers, and consumers can buy a new car only at a car dealer. The situation in which consumers do not know how to buy a new car does not appear to exist. Therefore, the variable of perceived behavior control is not studied within the framework of SDC purchasing behavior. Hence, we suppose that ENAT, SUNM, SEIM and ENKN are four influencing factors.

Beyond the basic TPB model, some researchers have suggested that situational factors such as economic incentive may also affect the transformation from car purchasing intention to behavior (Lane and Potter, 2007; Roberts, 1996; Cleveland et al., 2005). Thus, we include economic incentives as a factor in the theoretical model. The complete theoretical framework proposed in this study is illustrated in Fig. 1, which extends the TPB model to hypothesize that SDC purchasing intention is

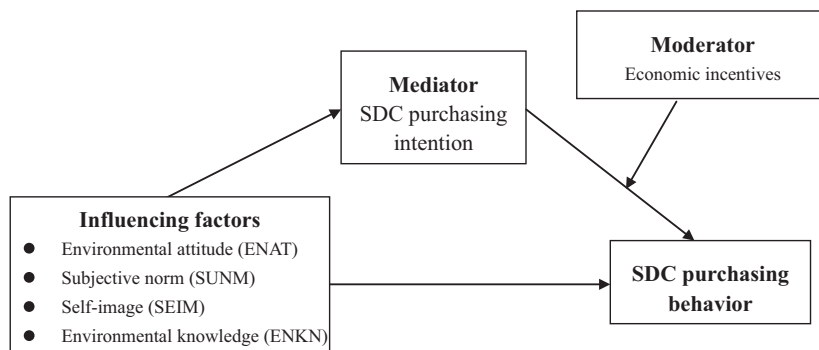


Fig. 1. A theoretical framework of SDC purchasing behavior.

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