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Analysis of Consumers' Attitudes Towards Purchasing PHEVs and HEVs in Manitoba, Canada

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Summary

This research focuses on Manitoba, Canada to explore the consumers' attitudes towards purchasing plug-in hybrid electric vehicles (PHEVs) and hybrid electric vehicles (HEVs). An online survey will be adopted to help explore participants' psychological distance to PHEVs and HEVs. Then, this study attempts to identify how psychological distance affects consumers' purchasing decision. The results may help government make efficient incentive policies and improve PHEVs and HEVs adoption.

Key words: consumers, marketing, PHEV, HEV, Canada

1.Introduction

Vehicles play an important role in transportation, our daily life and environment. When enjoy the convenience from vehicles, we also face to a series of environmental issues from them. Canada is a country with 0.5% of global population but accounts for around 2% of greenhouse gas (GHG) emissions of the world, meanwhile most Canadian GHG emissions are from transportation sector [1]. In addition, light duty gasoline cars and trucks accounted for the most GHG emissions [2]. These emissions seriously affect human health and lead to respiratory disease, cardiovascular problems and high risk for some cancers [3].

PHEVs and HEVs help improve air quality and reduce conventional fuel usage. For example, according to a research in Japan, PHEVs could reduce around 24% CO_2 than internal combustion engine vehicles [4]. In addition, New European Driving Cycle explored that electric vehicles consumed around 0.623 mega joules/kilometer, while internal combustion vehicles used about 68.5 milliliter/kilometer [5].

This research focuses on discussing Manitoba due to some specific reasons. First, there are around 1,200,000 Manitoba residents [6] driving more than 700,000 motorized vehicles and consuming 1.5 billion liters of gasoline and 1 billion liters of diesel fuel in a year which cost Manitoba over $2 billion in importing these fuel [7]. The individual GHG emissions and energy consumption are higher than most of other provinces in Canada. Meanwhile, Manitoba takes advantages in developing PHEVs and HEVs. The electricity price in Manitoba is almost the lowest in Canada and in terms of grid-mix, the hydroelectricity can surpass 98% of renewable electricity generation in North America [7].

Regarding to analyze consumers' attitudes towards purchasing PHEVs and HEVs in Canada, three hypotheses are posed below.

H1. Generally, the potential consumers are the people who have a higher education(H1a), have more than median income (H1b), drive low range every day (H1c) live with more than one family members (H1d), and have PHEVs and HEVs driving experience (H1e).
H2. The more people are familiar with price (H2a), available car styles (H2b), benefits and weakness (H2c) of PHEVs and HEVs, the more they are intent to buy PHEVs and HEVs
H3. The consumers who insist environmentalism are more potential to purchase PHEVs and HEVs than the consumers who fancy technology, or who are easily affected or who are keen on symbolism.

2. Literature Review

2.1 Psychological distance and construal-level theory (CLT)

"Psychological distant things (objects, events) are those that are not present in the direct experience of reality", so the distal entities are those that are not present and they may be "thought of, constructed or reconstructed [8]." Psychological distance between objects and individuals is usually different. Due to the different psychological distance, it also influences people in different level. Then, "construal-level theory (CLT) is an account of how psychological distance influences individuals' thoughts and behavior [9]." The relationship can be described as the more distal the psychological distance is, the higher the construal level is [9]. Namely, if the identities are distal to individuals, then the identities are more abstract and conceptual for individuals [10] [11]. In this research, CLT combined distance and abstraction are adopted to identify how consumers evaluate PHEVs and HEVs, and how consumers' decision is affected by primary necessary characteristics or secondary peripheral characteristics [9].

2.2 Current barriers and incentives in promoting PHEVs and HEVs

Indeed, compared to the sales of conventional vehicles, PHEVs and HEVs market is always "in winter" due to a series of tough problems such as uncompetitive sticker price, shorter cruising range, seldom charging station [12]. Currently, low gasoline price also makes PHEVs and HEVs sales an uphill climb and the future oil price trend uncertainty contributes to purchase uncertainty [13]. Besides, consumers' purchase uncertainty is also affected by lacking knowledge and experience, unfamiliar with potential risk of PHEVs and HEVs [12]. At the meantime, consumers will also consider the cars' lifecycle costs such as initial price, fuel cost, pollution cost and maintenance expenses and the savings from cars such as purchase rebate from government and fuel saving [14] [15].
However, in order to promote PHEVs and HEVs development, Ontario, Montreal and British Columbia provinces have put forward a series of policy incentives, which are generally divided into three sections, rebate (consumers can rebate up to $8,500 on purchasing or leasing eligible electric vehicles); investment on basic infrastructure (provinces intend to create a network of charging stations covering working, living and highway areas) and privilege (electric vehicle drivers can individually and frequently use high occupancy vehicle lanes) [16] [17] [18] [19].

3.Method Design

The questionnaire will be carried out online to investigate the consumers' attitudes in Manitoba. The questionnaire includes 18 questions and is divided into three main sections. The first section is to explore the participants' demographic information such as gender, age, income, household structure, number of licensed drivers in the family, car preference and participants' characteristics. The second is to investigate the participants' perceptions about the benefits and weakness of PHEVs and HEVs. Consumers can rate the importance of possible benefits and weakness listed in the table and can express their own assessment as well.

Third, the questionnaire identifies how participants are familiar with PHEVs and HEVs including car price, fuel consumption, available hybrid styles, followed by participants' willingness to PHEVs and HEVs.
Specifically, there are three objectives of this questionnaire.
1.To investigate the relationship between willingness to buy PHEVs and HEVs and other factors (age, education, income, participants' characteristics, family structure, travel patterns and familiarity about HEVs)
2.To identify consumers' direct experience of PHEVs and HEVs and how psychological distance plays in consumers' attitudes towards buying PHEVs and HEVs.
3.To acknowledge which factor (relevant policy incentives, technology stimulation or attractive car characteristics) most attract potential consumers to buy PHEVs and HEVs.

4. Preliminary Result

Now, this research is in process, the data is being collected and analysis will be followed after completing data collection. This research aims to complete before June, 2016.
In assumption, a preliminary result will be described blow,
First, in terms of consumers' demographic information, we predict that consumers who graduated from at least college; have more than $26,000 annual income (Canadian average median income); live in with more than three members' family and have driver license prefer to purchase PHEVs and HEVs.
Then, according to psychological distance and construal level theory, it is assumed that the more consumers experienced PHEVs and HEVs, the more they are intent to buy them. If the consumers are familiar with initial price, car styles, the benefits and weakness of these cars, then they are more possible to purchase. Even if they had test drive or had rent PHEVs and HEVs will make consumers more psychologically proximal to these cars. So let consumers try and know more knowledge about PHEVs and HEVs knowledge will also help PHEVs and HEVs adoption.
Third, it is consumed that if consumers insist environmentalism, keen on technology and focus on symbolism of the cars, they are more intent to adopt PHEVs and HEVs.

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