

## Literature Review on Purchase Intention of Battery Electric Vehicles and Consumer Innovativeness

Qi Qiu<sup>1,4</sup>, Ai Chin Thoo<sup>2</sup> and Zijuan Zhan<sup>3,4</sup>

<sup>1,2,3</sup>Faculty of Management, Universiti Teknologi Malaysia (UTM), 81310 Skudai, Johor, Malaysia, <sup>4</sup>Business School, Jiangxi Institute of Fashion Technology, Nanchang, Jiangxi, China  
Corresponding Author Email: qiuqi@graduate.utm.my

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v14-i1/20574> DOI:10.6007/IJARBSS/v14-i1/20574

**Published Date:** 14 January 2024

### Abstract

In recent years, battery electric vehicles has seen a sharp increase in both production and sales. Expansion of battery electric vehicles market will still be negatively impacted by range anxiety, charging anxiety, and safety anxiety. Therefore, it is important to spread knowledge about vehicles innovation and pay attention to customer innovativeness. However, just a few research have looked into how consumer innovativeness may influence consumers' market purchasing intentions. This study uses the content analysis method to analyze the articles related to the purchase intention of battery electric vehicles and consumer innovation from 2014 to 2023, determines the impact of consumer innovation on purchase intention, and finds that consumer innovation can be used as a key factor in predicting consumers' purchase intention of battery electric vehicles. The findings will aid in the government's and the automotive industry's understanding of the crucial part that consumer innovation plays in consumers' intentions to purchase battery electric vehicles. This study will also present helpful consumer-friendly insights for the market development of battery electric vehicles in order to achieve a seamless transition from fuel vehicles to electric vehicles.

**Keywords:** Purchase Intention, Battery Electric Vehicles, Consumer Innovativeness

### Introduction

In recent decades, the shift of the transportation sector to a low-carbon path has intensified due to growing worries about climate change and energy scarcity. Electric vehicles (EVs) are seen as the leading trend in the future of the transportation industry. The market for such vehicles consists of battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and other vehicles. The majority of the market share is held by BEVs (Lin & Wu, 2018). BEVs are vehicles that work on batteries and represent an emerging technological development that reduce CO<sub>2</sub> emissions and bring certain economic benefits (Schmalfuß et al., 2017). Furthermore, Lin and Shi (2022) has shown that the global need to control air pollution and achieve a low carbon transition from traditional vehicles to electric vehicles a critical step.

In order to promote the promotion of BEVs, this study aims to determine the purchase intention of battery electric vehicles and the impact of consumer innovativeness. Additionally, this paper also focuses on the relationship between consumer innovativeness and purchase intention of BEVs, and puts forward future research directions.

## **Literature Review**

### **Purchase Intention of Battery Electric Vehicles**

Purchase intention, which refers to customers' subjective tendencies toward a certain product, has also been demonstrated to be a key indication of consumer purchasing behavior (Chen et al., 2021; Hill et al., 1977; Ariffin et al., 2018; Kumar et al., 2017; Lu et al., 2016). Consumer purchase intention, as a fundamental element of consumer behavior, profoundly expresses whether a person is keen on a particular product, it is only a psychological awareness (Purwianti & Niawati, 2022). Moreover, purchase intention also affects consumers' action purchase decisions (Kumar et al., 2023; Sahu et al., 2020; Verma & Dewani, 2021).

Nowadays, many people are interested in green products. The main reason for this is that green products are more environmentally friendly than conventional or competitive products in production, use and end of life (Marcon et al., 2022). Moreover, green products satisfy intrinsic customer benefits while being perceived as less harmful to the environment, and green purchasing intentions will be seen as the driving force behind green behaviors (Sharma et al., 2022). When consumers buy products, consumers' green purchasing intentions lead to prioritizing green products (Moslehpour et al., 2022).

However, purchase green product is also viewed as a social dilemma that arises when customers make decisions because it may cause consumers inconvenience and expensive expenses (Fornara et al., 2016; Sun et al., 2022b). For example, along with the benefits of preserving energy security and lowering carbon emissions (Li et al., 2021b; Li et al., 2022), electric vehicles will also present challenges for consumers, including cruising range, slow charging, and high costs (Li et al., 2023).

That is why not all countries have a high level of consumer purchase intention on battery electric vehicles. Khan et al. (2020) illustrated that although Japan has a well-established hydrogen fuel cell vehicle technology, Japanese consumers prefer conventional vehicles. Buhmann and Criado (2023) shows that reputation-driven consumers in Spain believe that they are willing to purchase an electric vehicle only under high prices, due to the expensive purchase of BEVs is considered a status symbol. On the contrary, sales of electric vehicles are rising in various nations, including China, the United States, Norway, Germany (Brinkmann & Bhatiasevi, 2021).

### **Consumer Innovativeness**

Midgley and Dowling (1978) shows that individual innovativeness mainly refers to individuals who adopt new products on their own and make creative selections without external influence (Zhang et al., 2020). Similarly, some scholars argue that consumer innovativeness refers to the intention of consumers to be willing to buy new and unique products, rather than always following past product choices or purchasing behaviors (Jørgensen et al., 2022; Siraj et al., 2022; Testa et al., 2020).

In addition, some scholars divide consumer change into different dimensions. For example, Li et al (2021a); Li et al (2021b) are divided into hedonist innovativeness and social innovativeness; Hwang et al (2020); Hwang et al (2019) believe that consumer innovativeness

motivation is function, hedonic, cognitive, social. The hedonist innovation reflects the willingness of consumers to take risks and try new things, while social innovation focuses on uniqueness, the functional dimension focuses on efficiency and practical aspects, and the cognitive dimension focuses on exploration and creativity (Hwang et al., 2019; Li et al., 2021b). These innovations will also alter how prospective customers see the benefits and drawbacks of adopting new products (Wang et al., 2022).

### Research Methodology

Content analysis is one of the most common analysis methods, which can effectively analyze the situation of the field in order to understand the development trends in the field (Downe-Wamboldt, 1992; Hajek et al., 2022). This study included only English-language papers published in academic journals in the Scopus database between 2014 and 2023. Data mining takes place in 2023, with keywords such as "purchase intention", "battery electric vehicles", "electric vehicles", and "consumer innovativeness" used to search for studies. Keywords appear in the title and summary in the search and are sorted by relevance. Figure 1 shows all the steps to the selection of literature reviewed.

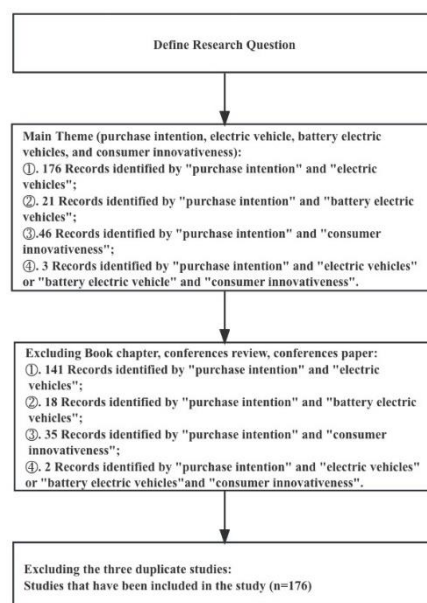


Figure 1. Flow Diagram for the Selection of Literature Reviewed

### Results and Discussions

#### Content Analysis of Purchase Intention of Battery Electric Vehicles

According to Figure 2, there is some studies demonstrating purchase intentions of EVs and BEVs. Previous studies defines purchase intention of BEVs as the likelihood of BEVs purchase after taking into account product factors (such as technical attributes and costs), individual factors (such as psychological factors and personal characteristics), and social factors (Huang & Ge, 2019; Sun et al., 2022a). On the other hand, despite the fact that electric vehicles feature a drive unit made up of one or more electric motors, incorporating both electric motors and drive concepts utilizing internal combustion engines (Brinkmann & Bhatiajevi, 2021). In some studies, electric vehicles are also referred to as battery electric vehicles (Adepetu & Keshav, 2015; Barth et al., 2016; Beck et al., 2016).

Moreover, studies found that behavior intention of electric vehicles is strong among the majority of Chinese consumers (He et al., 2022; Huang et al., 2021). For instance, Tian et al.

(2021) shows that for Jinan people, only a few consumers know about electric vehicles, but most of the surveyed consumers are willing to buy electric vehicles in the future. Moreover, Habich-Sobiegalla et al (2018) discovered that Chinese citizens had the strongest intention to purchase electric vehicles when compared to Brazilian and Russian citizens. On the other hand, different provinces' residents have inconsistent intentions for electric vehicles. Li et al. (2023) summarizes the intentions of customers for electric cars in 20 provinces of China, electric vehicle sales suffer, and consumer intentions are negative when the city's temperature is exceptionally hot or cold.

Meanwhile, most of previous studies on the purchase intention of electric vehicles in China studies consumers in first-tier cities, such as Beijing, Shanghai, Guangzhou, Shenzhen (Lin & Wu, 2018). Inadequate studies have been done on China's other-tier cities. Nevertheless, previous study found that purchase intention of battery electric vehicles has a strong correlation with purchase behavior (Hoang et al., 2022). However, consumer intention to purchase an electric vehicle is not always guarantee to be translated into actual purchase behavior (Song et al., 2022). This could be a result of the fact that the cause of the shift in consumer behavior affecting electric vehicles is still unknown (Wu et al., 2019).

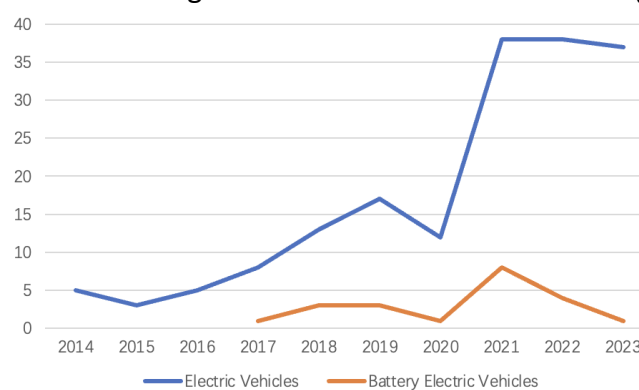


Figure 2. Number of Annual Publication in Purchase Intention of EVs and BEVs from Scopus

### Content Analysis of Consumer Innovativeness

Consumer innovation is frequently utilized in consumer behavior because it takes into account the multidimensional view of the product that customers themselves have. The use of consumer innovation is displayed in Table 1. This table shows that it can be used in the electric vehicles, green products, organic food, robotic restaurant, and other fields. Additionally, consumer innovation appears to be crucial to the study of environmental protection and products using cutting-edge technologies. At the same time, the researchers found that consumer innovation does not consistently positively influence consumer behavior. For example, Siraj et al. (2022) found that sustainable labeling negatively influences consumer invention. Some scholars believe that only some dimensions of consumer innovation directly affect behavior (Hwang et al., 2020; Li et al., 2021a).

However, in most instances, people that are highly innovative will be more favorable toward new products (Chauhan et al., 2021; Liao, 2022). For example, past studies have shown that the emotional or hedonic properties of consumer innovation can influence the willingness to buy or adopt electric vehicles (Rezvani et al., 2015). Customers can improve consumer sentiment when they have a heart-felt understanding of the design, size, and aesthetics of electric vehicles. On the other hand, understanding the process of product innovation requires participants to obtain shared information by socializing with others (Wang et al., 2022). Similarly, China has introduced many policies to boost sales of electric

vehicles, but not all of them promote consumer behavior. Liao (2022) found that non-financial subsidies and intentions to adopt electric vehicles are not moderated by consumer innovation, but financial subsidies and intentions can be.

In general, if a product's innovative qualities live up to the consumer's expectations of innovation value, it may encourage them to adopt new product. As a result, consumer innovation also has a big impact on whether people choose to buy electric cars. This study find that consumer innovativeness can as one of the predictors of purchase intention to ascertain its function in marketing the Chinese electric vehicles market.

Table 1

*Previous Literature on Consumer Innovativeness in Consumer Behavior Studies*

<b>Authors</b>	<b>Constructs</b>	<b>Country</b>	<b>Findings</b>
Siraj et al. (2022)	Sustainable Labelling	China	Consumer innovativeness is negatively correlated with purchase intention
Liao (2022)	Electric Vehicle	China	Consumer innovativeness can effectively moderate financial policy and the adoption of electric vehicles
Chauhan et al. (2021)	Green Products	India	Personal innovativeness can effectively influence purchase intention of green products
Li et al. (2021a)	Organic Food	China	The social innovativeness dimension of consumers can directly affect consumers' green behavior, but hedonic innovativeness only has an indirect effect.
Dangelico et al. (2021)	Green Purchase Behavior	Italy	For consumers' green purchasing behavior, higher consumer innovation did not lead to higher satisfaction, willingness to pay premiums, and purchase frequency.
Li et al. (2021b)	Purchase Sustainable Products	China	Whether the relationship between consumer innovativeness and sustainable product purchasing behavior can be fully mediated depends on product involvement. And the mediating outcomes of social innovativeness and hedonic innovativeness will different.
Hwang et al. (2020)	Robotic Restaurant	South Korea	Consumer innovativeness that is driven by social, functional, or hedonistic motivations can have a favorable impact on the overall image. Consumer innovation that is cognitively motivated, however, cannot.
Zhang et al. (2020)	Smart Toys	China	A high level of consumer innovativeness can make the impact of perceived product innovativeness on perceived social value stronger

Al-Jundi et al. (2019)	New Product	United Arab Emirates	Consumer innovativeness drives consumers to purchase new products. Consumer innovation that is motivated by function, hedonism, or social concerns can All have a positive impact on consumer attitudes, while innovation that is motivated by cognitive concerns cannot.
Hwang et al. (2019)	Drone Delivery Services	Food Korea	

## Conclusions

This study's objective is to perform a thorough evaluation of the literature in order to determine where purchase intentions for BEVs stand right now. Battery electric vehicles are concerned by people because of their environmental protection attributes and the inclusion of new technologies. However, few studies have applied consumers' innovativeness to the purchase of BEVs, nor have they effectively used the advantages of new technologies of BEVs to encourage the developing of BEVs.

Therefore, this study measures the application of consumer innovativeness in consumer behavior and the possibility of effective use of purchase intentions in battery electric vehicles. In addition, the promotion of battery electric vehicles, grasping consumer psychological factors is the key. In future research, scholars could combine the cultural background of consumers to explore the influence of psychological factors on the purchase intention of BEVs.

## References

- Adepetu, A., & Keshav, S. (2015). The relative importance of price and driving range on electric vehicle adoption: Los Angeles case study. *Transportation, 44*(2), 353-373,
- Al-Jundi, S. A., Shuhaiber, A., & Augustine, R. (2019). Effect of consumer innovativeness on new product purchase intentions through learning process and perceived value. *Cogent Business & Management, 6*(1), 1698849,
- Barth, M., Jugert, P., & Fritsche, I. (2016). Still underdetected—Social norms and collective efficacy predict the acceptance of electric vehicles in Germany. *Transportation Research Part F: Traffic Psychology and Behaviour, 37*, 64-77,
- Beck, M. J., Rose, J. M., & Greaves, S. P. (2016). I can't believe your attitude: A joint estimation of best worst attitudes and electric vehicle choice. *Transportation, 44*(4), 753-772,
- Brinkmann, D., & Bhatiasevi, V. (2021). Purchase intention for electric vehicles among young adults in Thailand. *Vision: The Journal of Business Perspective, 27*(1), 110-118,
- Buhmann, K. M., & Criado, J. R. (2023). Consumers' preferences for electric vehicles: The role of status and reputation [Article]. *Transportation Research Part D: Transport and Environment, 114*, Article 103530
- Chauhan, H., Pandey, A., Mishra, S., & Rai, S. K. (2021). Modeling the predictors of consumers' online purchase intention of green products: The role of personal innovativeness and environmental drive. *Environment, Development and Sustainability, 23*(11), 16769-16785,
- Chen, X., Li, Y., Davison, R. M., & Liu, Y. (2021). The impact of imitation on Chinese social commerce buyers' purchase behavior: The moderating role of uncertainty. *International Journal of Information Management, 56*, 102262,

- Dangelico, R. M., Nonino, F., & Pompei, A. (2021). Which are the determinants of green purchase behaviour? A study of Italian consumers. *Business Strategy and the Environment*, 30(5), 2600-2620,
- Downe-Wamboldt, B. (1992). Content analysis: Method, applications, and issues. *Health Care for Women International*, 13(3), 313-321,
- Fornara, F., Pattitoni, P., Mura, M., & Strazzeria, E. (2016). Predicting intention to improve household energy efficiency: The role of value-belief-norm theory, normative and informational influence, and specific attitude. *Journal of Environmental Psychology*, 45, 1-10,
- Habich-Sobiegallo, S., Kostka, G., & Anzinger, N. (2018). Electric vehicle purchase intentions of Chinese, Russian and Brazilian citizens: An international comparative study. *Journal of Cleaner Production*, 205, 188-200,
- Hajek, P., Youssef, A., & Hajkova, V. (2022). Recent developments in smart city assessment: A bibliometric and content analysis-based literature review. *Cities*, 126, 103709,
- He, J., Li, J., Zhao, D., & Chen, X. (2022). Does oil price affect corporate innovation? Evidence from new energy vehicle enterprises in China. *Renewable and Sustainable Energy Reviews*, 156, 111964,
- Hill, R. J., Fishbein, M., & Ajzen, I. (1977). Belief, attitude, intention, and behavior: An introduction to theory and research. 6(2), 244,
- Hoang, T. T., Pham, T. H., & Vu, T. M. H. (2022). Examining customer purchase decision towards battery electric vehicles in Vietnam market: A combination of self-interested and pro-environmental approach. *Cogent Business & Management*, 9(1), 2141671,
- Huang, X., & Ge, J. (2019). Electric vehicle development in Beijing: An analysis of consumer purchase intention. *Journal of Cleaner Production*, 216, 361-372,
- Huang, X., Lin, Y., Lim, M. K., Tseng, M.-L., & Zhou, F. (2021). The influence of knowledge management on adoption intention of electric vehicles: perspective on technological knowledge. *Industrial Management & Data Systems*, 121(7), 1481-1495,
- Hwang, J., Kim, H., & Kim, W. (2019). Investigating motivated consumer innovativeness in the context of drone food delivery services. *Journal of Hospitality and Tourism Management*, 38, 102-110,
- Hwang, J., Park, S., & Kim, I. (2020). Understanding motivated consumer innovativeness in the context of a robotic restaurant: The moderating role of product knowledge. *Journal of Hospitality and Tourism Management*, 44, 272-282,
- Jørgensen, S., Pedersen, L. J. T., & Skard, S. (2022). How going green builds trusting beliefs. *Business Strategy and the Environment*, 31(1), 297-311,
- Kamalul Ariffin, S., Mohan, T., & Goh, Y.-N. (2018). Influence of consumers' perceived risk on consumers' online purchase intention. *Journal of Research in Interactive Marketing*, 12(3), 309-327,
- Khan, U., Yamamoto, T., & Sato, H. (2020). Consumer preferences for hydrogen fuel cell vehicles in Japan. *Transportation Research Part D: Transport and Environment*, 87, 102542,
- Kumar, B., Manrai, A. K., & Manrai, L. A. (2017). Purchasing behaviour for environmentally sustainable products: A conceptual framework and empirical study. *Journal of Retailing and Consumer Services*, 34, 1-9,
- Kumar, S., Prakash, G., Gupta, B., & Cappiello, G. (2023). How e-WOM influences consumers' purchase intention towards private label brands on e-commerce platforms:

- Investigation through IAM (Information Adoption Model) and ELM (Elaboration Likelihood Model) Models. *Technological Forecasting and Social Change*, 187, 122199,
- Li, L., Wang, Z., Li, Y., & Liao, A. (2021a). Consumer innovativeness and organic food adoption: The mediation effects of consumer knowledge and attitudes. *Sustainable Production and Consumption*, 28, 1465-1474,
- Li, L., Wang, Z., Li, Y., & Liao, A. (2021b). Impacts of consumer innovativeness on the intention to purchase sustainable products. *Sustainable Production and Consumption*, 27, 774-786,
- Li, L., Wang, Z., & Xie, X. (2022). From government to market? A discrete choice analysis of policy instruments for electric vehicle adoption. *Transportation Research Part A: Policy and Practice*, 160, 143-159,
- Li, X., Zhao, X., Xue, D., & Tian, Q. (2023). Impact of regional temperature on the adoption of electric vehicles: An empirical study based on 20 provinces in China. *Environmental Science and Pollution Research*, 30(5), 11443-11457,
- Liao, Y. (2022). Intention of consumers to adopt electric vehicle in the post-subsidy era: evidence from China. *International Journal of Sustainable Transportation*, 16(7), 647-659,
- Lin, B., & Shi, L. (2022). Identify and bridge the intention-behavior gap in new energy vehicles consumption: Based on a new measurement method. *Sustainable Production and Consumption*, 31, 432-447,
- Lin, B., & Wu, W. (2018). Why people want to buy electric vehicle: An empirical study in first-tier cities of China. *Energy Policy*, 112, 233-241,
- Lu, B., Fan, W., & Zhou, M. (2016). Social presence, trust, and social commerce purchase intention: An empirical research. *Computers in Human Behavior*, 56, 225-237,
- Marcon, A., Ribeiro, J. L. D., Dangelico, R. M., de Medeiros, J. F., & Marcon, É. (2022). Exploring green product attributes and their effect on consumer behaviour: A systematic review. *Sustainable Production and Consumption*, 32, 76-91,
- Midgley, D. F., & Dowling, G. R. (1978). Innovativeness: The concept and its measurement. *Journal of Consumer Research*, 4(4), 229-242,
- Moslehpour, M., Chau, K. Y., Du, L., Qiu, R., Lin, C.-Y., & Batbayar, B. (2022). Predictors of green purchase intention toward eco-innovation and green products: Evidence from Taiwan. *Economic Research-Ekonomika Istrazivanja*, 1-22,
- Purwianti, L., & Niawati, N. (2022). Analysis of e-WOM, brand attitude, brand image on purchase intention. *SEIKO: Journal of Management & Business*, 5(1), 356-366,
- Rezvani, Z., Jansson, J., & Bodin, J. (2015). Advances in consumer electric vehicle adoption research: A review and research agenda. *Transportation Research Part D: Transport and Environment*, 34, 122-136,
- Sahu, A. K., Padhy, R., & Dhir, A. (2020). Envisioning the future of behavioral decision-making: A systematic literature review of behavioral reasoning theory. *Australasian Marketing Journal*, 28(4), 145-159,
- Schmalfuß, F., Mühl, K., & Krems, J. F. (2017). Direct experience with battery electric vehicles (BEVs) matters when evaluating vehicle attributes, attitude and purchase intention. *Transportation Research Part F: Traffic Psychology and Behaviour*, 46, 47-69,
- Sharma, K., Aswal, C., & Paul, J. (2022). Factors affecting green purchase behavior: A systematic literature review. *Business Strategy and the Environment*, 32(4), 2078-2092,
- Siraj, A., Taneja, S., Zhu, Y., Jiang, H., Luthra, S., & Kumar, A. (2022). Hey, did you see that label? It's sustainable!: Understanding the role of sustainable labelling in shaping



- sustainable purchase behaviour for sustainable development. *Business Strategy and the Environment*, 31(7), 2820-2838,
- Song, M. R., Chu, W., & Im, M. J. I. J. o. C. S. (2022). The effect of cultural and psychological characteristics on the purchase behavior and satisfaction of electric vehicles: A comparative study of US and China. *46(1)*, 345-364,
- Sun, K. K., He, S. Y., & Thøgersen, J. (2022a). The purchase intention of electric vehicles in Hong Kong, a high-density Asian context, and main differences from a Nordic context. *Transport Policy*, 128, 98-112,
- Sun, Y., Li, T., & Wang, S. (2022b). "I buy green products for my benefits or yours": understanding consumers' intention to purchase green products. *Asia Pacific Journal of Marketing and Logistics*, 34(8), 1721-1739,
- Testa, F., Iovino, R., & Iraldo, F. (2020). The circular economy and consumer behaviour: The mediating role of information seeking in buying circular packaging. *Business Strategy and the Environment*, 29(8), 3435-3448,
- Tian, X., Zhang, Q., Chi, Y., & Cheng, Y. (2021). Purchase willingness of new energy vehicles: A case study in Jinan City of China. *Regional Sustainability*, 2(1), 12-22,
- Verma, D., & Dewani, P. P. (2021). eWOM credibility: a comprehensive framework and literature review. *Online Information Review*, 45(3), 481-500,
- Wang, N., Huang, Y., Fu, Y., & Chen, L. (2022). Does lead users matter for electric vehicle adoption? An integrated perspective of social capital and domain-specific innovativeness. *Journal of Consumer Behaviour*, 21(6), 1405-1419,
- Wu, X., Gong, J., Greenwood, B. N., & Song, Y. A. (2019). No longer riding dirty: The effect of electric vehicle subsidies on the diffusion of emerging technologies in automobile markets. *SSRN Electronic Journal*,
- Zhang, F., Sun, S., Liu, C., & Chang, V. (2020). Consumer innovativeness, product innovation and smart toys. *Electronic Commerce Research and Applications*, 41, 100974,