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How To Enhance Consumers' Sustainability Activities: Sustainable, Smart Connected Cars

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TREO Workshop Paper

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Abstract

A sustainable, smart connected car (SSCC) is one of the most popular sustainable consumer products. Governments often announce various sustainability-related policies, including zero-emission policies and financial subsidies, aimed at encouraging companies to develop sustainable products and consumers to purchase them. Typically, SSCCs use the Internet of Things and AI technology to maximize sustainability performance. However, this also entails the collection of personal information. Accordingly, to evaluate the influence of government initiatives on consumer engagement in adopting SSCCs, we should consider multiple aspects such as environmental performance, cultural factors, and privacy issues. Since the privacy-common good trade-off theory explains consumers' sustainability behaviors with privacy concerns and government policies, particularly SSCCs, we examine the relationship between government policies, smart technology, cultural factors, privacy concerns, and the environmental performance of SSCCs. To understand the holistic view of consumer sustainability engagement in adopting SSCCs, we apply interviews, social media analysis, and experimental surveys.

Keywords: Electric vehicle, government intervention, privacy-common good trade-off theory, smart technology, sustainability.

1 Introduction

The transformative potential of sustainable, smart connected cars (SSCCs) has drawn significant attention in the realm of smart technology, given their promise to revolutionize environmental sustainability and efficiency. The adoption of SSCCs is critical in the global pursuit of reduced carbon dioxide (CO_2) emissions and environmental preservation. However, the diffusion of such innovative technologies is not solely a matter of technological advancement, but also involves a complex interplay of government initiatives, sustainability preferences, and privacy issues (Choi & Lowry, 2024). This research aims to evaluate these multifaceted influences on consumers' sustainability activities in the adoption of SSCCs, providing an understanding of the catalysts and barriers within this sustainability and smart technology domain.

Government intervention is often seen as the linchpin in promoting consumer engagement concerning sustainability (Breetz & Salon, 2018). For instance, net-zero policies and financial incentives can help foster the widespread acceptance of SSCCs. Moreover, consumers' collective environmental consciousness is posited to be a driving force in the embrace of SSCCs.

On the flip side, while largely positive, the environmental performance of SSCCs is challenging. The adoption of SSCCs entails confronting technological constraints like privacy issues and infrastructural limitations, such as the lack of charging stations. We examine these concerns in detail, considering how the integration of smart technologies in SSCCs might impact consumer attitudes and the decision-making process regarding SSCCs because SSCCs fall within the broader category of connected cars based on the Internet of Things and AI technology. These factors necessitate a balanced exploration of the environmental benefits versus the potential challenges of SSCCs.

Central to this discussion is the application of the *privacy-common good trade-off* (PCGT) theory (Choi & Lowry, 2024). This theoretical framework provides an insightful lens in understanding consumer decisions regarding SSCCs, particularly the negotiation between privacy concerns and the perceived benefits to the common good that SSCCs represent, such as environmental sustainability. By

integrating the PCGT theory with empirical findings, we develop a set of hypotheses that will guide the exploration of these complex dynamics regarding consumers' sustainability activities.

This paper sets out to construct a comprehensive picture of sustainability engagement in the SSCC adoption landscape, weaving together government intervention, environmental performance, tight cultures, and privacy considerations. This enriches our understanding of the factors based on smart technology that can propel and hinder consumers' sustainability engagement.

2 Literature Review and Theoretical Background

The transition to SSCCs is a critical step toward achieving global sustainability goals. This literature review assesses the current body of knowledge surrounding the factors influencing consumer engagement in adopting SSCCs, including government interventions, consumer engagement, environmental performance, and privacy concerns.

2.1 Government Intervention

Government policies and financial incentives are pivotal in shaping the consumer adoption landscape for SSCCs. Breetz and Salon (2018, p. 238) emphasize sustainable vehicles' purchase price outweighs fuel cost savings and maintenance cost savings while using SSCCs; "Extensive sensitivity analyses highlight the impact of key parameters and show that both federal and state incentives were necessary." In addition, government subsidies for electric vehicles (EVs) have a significant influence on consumers' SSCC purchase intentions (Choi & Lowry, 2024) .

2.2 Consumer Engagement

Consumer engagement can be defined as the level of consumers' activities regarding a company. Higher consumer engagement with various activities, such as purchases, incentivized referrals, social influence, and knowledge sharing, enhances a company's competitiveness (Kumar & Pansari, 2016). This concept is crucial in the context of SSCCs because it explains the importance of developing strong relationships between SSCC manufacturers and their consumers. This implies that companies must align their offerings with consumers' expectations and experiences, particularly regarding sustainability performance and the protection of personal information.

2.3 Environmental Performance of SSCCs

Multiple factors can affect how consumers perceive environmental performance. It is important to understand the consumer perception of environmental effects because environmental performance is a critical indicator of sustainable car purchase intentions (Degirmenci & Breitner, 2017). Some researchers focus on the potential environmental benefits of SSCCs based on the common good (Choi & Lowry, 2024). However, other researchers assess the current challenges in environmental performance. For example, Rietmann et al. (2020, p. 1) suggest that "reductions in CO_2 emissions can be achieved with the predicted EV growth, given that countries invest heavily in renewable energy sources" that are limited on the planet.

2.4 Privacy Concerns in SSCCs

With the advancement of smart technology in sustainable vehicles, privacy concerns have become increasingly important. Cichy et al. (2021) explore the implications of data collection and sharing in connected cars, identifying potential vulnerabilities that could lead to sensitive personal data breaches. Their research underscores the importance of designing SSCCs with robust privacy protections. In addition, regarding consumers' sustainable technology adoptions, the results of the findings show that the perceived privacy risks significantly affect consumers' intentions to adopt smart metering

technologies (Wunderlich et al., 2019). Moreover, some researchers' findings indicate that privacy concerns indirectly influence consumers' SSCC purchase intentions (Choi & Lowry, 2024).

2.5 Privacy-Common Good Trade-off Theory

The PCGT theory offers a framework for understanding how consumers balance their privacy concerns with the perceived benefits to the common good, including SSCC sustainability (Choi & Lowry, 2024). This trade-off becomes particularly salient in the context of smart and sustainable products because smart technology enhances sustainability performance while leading to privacy vulnerability from the disclosure of personal information. Accordingly, this theory helps to explore how privacy concerns might influence the decision on consumers' sustainability engagement in the context of SSCC adoption. These concerns can be mitigated through sustainability benefits and government incentives. Furthermore, this research extends the PCGT theory by adopting the concept of tight culture (Hu et al., 2023) because privacy concerns can vary based on cultural differences (Lowry et al., 2011).

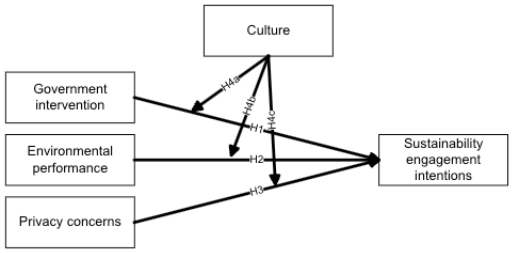

Figure 1. Proposed research model

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