

UNDERSTANDING STATUS QUO BIAS IN ELECTRIC VEHICLE ADOPTION: A SYSTEMATIC REVIEW THROUGH THE LENS OF PROSPECT THEORY

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Abstract

The transition to electric vehicle (EV) mobility is widely recognised as a critical step toward achieving global decarbonisation goals. Regardless of technological advancements and supportive policy frameworks, consumer adoption of EVs remains limited. This systematic literature review investigates the psychological barrier of status quo bias (SQB) as a central factor in consumer resistance to EV adoption, using Prospect Theory as the theoretical foundation. A total of 37 peer-reviewed journal articles were selected through a structured screening process based on predetermined inclusion criteria, focusing on behavioural constructs, automobile-related decision-making, and the clear application of Prospect Theory. Descriptive and thematic analyses revealed that SQB is marked through behavioural motions, default preferences, and loss aversion, all of which are amplified by perception of risk reference and point dependence. The review also identifies key psychological and contextual factors that reinforce SQB, including bounded rationality and uncertainty aversion. While Prospect Theory offers a robust explanatory framework, significant gaps remain in the literature, including the limited application of alternative behavioural theories, the scarcity of cross-cultural research, and the underutilization of experimental methods. The findings underscore the importance of integrating behavioural insights into EV policy design, alongside technological and infrastructural improvements. This review contributes to a deeper understanding of consumer behaviour in sustainable mobility transitions and highlights the need for behaviourally informed strategies to overcome resistance to EV adoption.

Keywords: behavioural economics, electric vehicle adoption, Prospect Theory, status quo bias, sustainable mobility

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Introduction

Background of the study

Given that the transportation sector accounts for approximately 70% of all oil production and contributes around 25% of global CO₂ emissions, the increasing urgency of mitigating climate change has elevated decarbonisation to the top of international policy agendas (Zhou et al., 2021). Governments around the world have taken proactive measures to reduce reliance on transportation based on fossil fuels after realising their significant contribution to greenhouse gas emissions. Notably, in line with the decarbonization goals of the Paris Agreement, the European Union has committed to phasing out internal combustion engine vehicles (ICEVs) by 2035 (European Commission, 2022; European Parliament, 2018; UNFCCC, 2023). With life-cycle emission reductions of up to 90% when compared to ICEVs, electric vehicles (EVs), and especially battery electric vehicles (BEVs), are viewed as key to this transition (Verma et al., 2022).

Despite these advantages, global EV adoption rates remain relatively low (European Environment Agency, 2022), suggesting that barriers extend beyond technical and economic considerations. Insights from behavioural economics, especially Prospect Theory, provide valuable explanations for this gap. In relation to the prospect theory, people often view possible losses more strongly than comparable gains, which causes them to make risk-averse decisions (Wang et al., 2018). In the context of EV adoption, this manifests as consumer apprehension regarding higher upfront costs, limited driving range, and unfamiliar charging infrastructure, even when these disadvantages are offset by long-term benefits (Anastasiadou & Gavanas, 2022). Furthermore, by encouraging a preference for well-known, current car technologies over novel ones, status quo bias (SQB) strengthens this resistance (Illmann & Kluge, 2020; Zhang et al., 2018). Nevertheless, the current literature does not adequately examine the role of status quo bias in sustainable mobility transitions, despite its importance.

Research problem

Despite the environmental and technological advantages of electric vehicles, global adoption rates remain low, indicating that non-economic factors significantly influence consumer decisions. The status quo bias has emerged as a significant barrier in this context. It causes individuals to overvalue familiar internal combustion engine vehicles and undervalue EVs, even when presented with rational benefits. Understanding status quo bias is therefore essential for uncovering the psychological roots of consumer resistance and for designing more effective EV adoption strategies.

Objectives of the review

In this context, the following objectives are formulated to guide a systematic review of literature examining the influence of status quo bias on EV adoption:

RO1: To recognise and classify the ways in which status quo bias develops in consumer choices regarding the adoption of electric vehicles.

RO2: To evaluate the extent to which Prospect Theory has been used to explain consumer hesitancy and perceived trade-offs when switching from traditional to electric vehicles.

RO3: To investigate the contextual, behavioural, and psychological elements that contribute to status quo bias in the adoption of electric vehicles.

RO4: To provide guidance for future behavioural research on sustainable mobility transitions by combining knowledge from the body of existing literature and identifying theoretical and empirical gaps.

Methodology

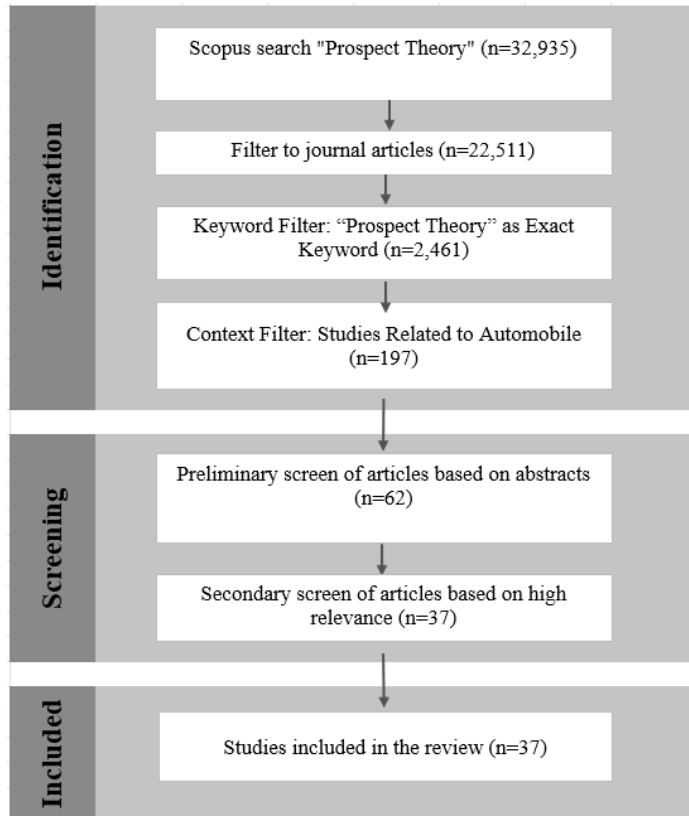
Research design and strategy

This study adopts a systematic literature review (SLR) approach, structured in alignment with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol to ensure transparency, replicability, and academic rigour. The review aims to explore how Prospect Theory has been applied in understanding status quo bias and its influence on electric vehicle adoption. Clear inclusion and exclusion criteria were applied to filter relevant literature. Only peer-reviewed journal articles were considered to ensure credibility. Articles were included if they (i) explicitly applied Prospect Theory, (ii) focused on automobile-related consumer behaviour (mainly EVs), and (iii) addressed behavioural constructs such as SQB. Articles lacking direct relevance to consumer decision-making or EV context were excluded. Non-English publications and non-journal documents were also filtered out to maintain consistency in line with PRISMA 2020 guidelines.

Data sources and selection process

The literature search was conducted using the Scopus database, which offers extensive coverage and advanced filtering capabilities. A five-phase process was used: (1) mapping the field through a scoping review confirmed a research specific at the intersection of Prospect Theory, status quo bias, and EV adoption; (2) a comprehensive search narrowed 32,935 initial records to 197 articles using the string TITLE-ABS-KEY (prospect AND theory) AND (automobile) with additional filters (article type and exact keyword); (3) quality assessment involved manually screening abstracts for theoretical relevance and contextual alignment, producing 62 articles, of which 37 were selected for final review; (4) data extraction involved coding article metadata, theoretical application, and behavioural findings; and (5) data synthesis and write-up involved thematic mapping of SQB-related constructs to Prospect Theory.

Figure 1
PRISMA flow diagram



(Source: Authors' Compilation)

Results, Discussion and Limitations

Descriptive analysis

Geographical coverage of studies

The geographical distribution of the 37 included studies reveals a strong concentration in Asia and North America. The majority of studies were conducted in China (12), followed by India (5) and the United States (4). Other countries represented include Germany, Australia, South Korea, Mexico, Malaysia, Indonesia, Oman, Japan, Belgium, and several global or regional contexts such as North America and European cities. This indicates an emerging global interest in behavioural economics and sustainable mobility, though contributions remain unevenly distributed.

Theoretical frameworks employed

Theoretical mapping revealed that Prospect Theory was the most prevalent framework, being explicitly used in 11 out of 37 studies, whereas neither the Diffusion of Innovations Theory nor the Technology Acceptance Model (TAM) was used in any of the studies. A large portion of studies (26 articles) did not specify any alternative

framework beyond Prospect Theory, underscoring its centrality in analysing SQB and risk-based decision-making in EV contexts.

Methodological approaches used

A wide range of methods, including empirical, experimental, theoretical, and simulation-based designs, was employed. Behavioural game theory, survey-based econometric analysis, simulation modelling, field experiments, and discrete choice experiments were among the specific techniques used. This diversity illustrates the interdisciplinary integration of psychology, economics, and transportation studies in this field and reflects the difficulty of studying behavioural constructs like SQB.

Thematic synthesis

Objective 1: Identification and categorisation of the ways in which Status Quo Bias manifests in consumer choices regarding the adoption of electric vehicles.

According to the reviewed literature, SQB is a complex psychological tendency that manifests as reluctance on the part of consumers to transition from internal combustion engine vehicles to electric alternatives. Key forms of this bias include inertia in adoption timing, default preference for known technologies, and resistance to change rooted in perceived risk or uncertainty. Studies such as Goyal et al. (2022), Li et al. (2024), and Klein & Deissenroth (2017) explicitly highlight how SQB contributes to delayed EV adoption, despite policy incentives or environmental benefits. According to these works, consumers frequently return to the status quo because they are psychologically comfortable with it, even in situations where logical economic or ecological arguments favour the change.

Objective 2: Evaluation of the extent to which Prospect Theory explains consumer hesitancy and perceived trade-offs when transitioning from traditional to electric vehicles.

Prospect Theory plays a central role in the literature in explaining why consumers exhibit resistance to EV adoption regardless of long-term benefits. A dominant theme across studies is loss aversion, where potential disadvantages, such as a limited range, charging inconvenience, and resale uncertainty, are weighed more heavily than future gains. Additionally, reference point dependence, the tendency to evaluate new choices relative to existing ICE vehicle experiences, distorts consumer evaluations. Multiple studies, including those by Wang et al. (2022), Ryu & Kim (2023), and Zhang & Zhang (2025), demonstrate that framing effects and cognitive biases rooted in Prospect Theory can systematically bias consumer decisions against EVs. These insights underscore the necessity of behavioural models that move beyond rational choice assumptions.

Objective 3: Investigation of contextual, behavioural, and psychological factors contributing to Status Quo Bias in the adaptation of electric vehicles.

Status Quo Bias in EV decision-making was strengthened by a variety of behavioural and psychological factors that interacted with contextual variables. Notably, bounded rationality, the tendency to rely on cognitive shortcuts when facing complex decisions and risk perception, plays a substantial role in shaping consumer resistance. Regardless of their apparent advantages, consumers view EVs as riskier or less useful, according to studies like those by Ryu & Kim (2023), Wang et al. (2025), and Heutel (2019). Contextual uncertainties, such as underdeveloped infrastructure or insufficient information, further compound psychological hesitation. These findings collectively emphasise that overcoming SQB requires addressing not only attitudes but also the surrounding decision environment.

Objective 4: Provision of guidance for future behavioural research on sustainable mobility transitions through synthesising existing literature and identifying theoretical and empirical gaps.

While Prospect Theory has been extensively applied to EV adoption behaviour, the literature reveals clear empirical and theoretical gaps. A notable limitation is the geographical concentration of studies in China, India, and North America, with minimal representation from smaller or developing markets. Additionally, most studies are cross-sectional or simulation-based, lacking longitudinal data or real-world behavioural interventions. It is also necessary to expand theoretical frameworks beyond Prospect Theory by incorporating the Theory of Planned Behaviour (TPB), the Diffusion of Innovations Theory, or nudge-based models, as noted by Zhang & Zhang (2025), Hammond et al. (2020), and Wang & Hazen (2016). Filling in these gaps would allow for more complex insights and facilitate the development of more efficient, context-sensitive EV policies.

Limitations

Although this review applied a rigorous PRISMA protocol, several limitations must be acknowledged. First, the review was limited to peer-reviewed journal articles published in English, which may have excluded relevant regional or grey literature. Second, reliance on the Scopus database could have introduced publication bias by omitting studies indexed elsewhere. Third, while thematic synthesis enabled conceptual depth, it did not include quantitative meta-analysis, which could have provided stronger empirical generalisation. Finally, most reviewed studies originated from developed or rapidly industrialising nations, limiting transferability to smaller developing economies such as Sri Lanka. Future research should incorporate multiple databases, longitudinal field experiments, and cross-cultural behavioural analyses to broaden the understanding of Status Quo Bias in sustainable mobility contexts.

Conclusion and Recommendations

Conclusion

This systematic review concludes that Status Quo Bias constitutes a significant psychological barrier to the adoption of electric vehicles, even in contexts where economic and environmental incentives are in place. The literature consistently highlights that consumers tend to maintain existing preferences for internal combustion engine vehicles due to perceived risks, habitual behaviour, and aversion to change. SQB manifests in forms such as default decision-making, delayed adoption, and resistance to innovation, which are deeply rooted in loss aversion, reference point dependence, and framing effects as defined under Prospect Theory.

The results confirm that policy incentives and technological advancements by themselves are not enough to change consumer behaviour in favour of sustainable mobility. Rather, it is necessary to specifically address the behavioural and psychological aspects. Resistance to EV adoption is further exacerbated by a variety of behavioural, psychological, and contextual factors, such as uncertainty aversion, bounded rationality, and social influences. The persistence of SQB continues to slow down the rate of transition despite widespread international efforts to promote EVs, especially in cases where behavioural interventions are either absent or ineffective.

Recommendations

Based on the synthesised evidence, the following key recommendations are proposed to guide future research and policy development:

1. Apply experimental and simulation-based methods: As several reviewed studies (Ryu & Kim, 2023; Wang et al. (2025) highlight that simulation enables modelling of behavioural uncertainty, making it a valuable extension for future EV research.
2. Design culturally adaptive EV policies: Findings reveal that cultural context influences risk perception (Zhou et al., 2021), suggesting that localised behavioural interventions are essential.
3. Integrate behavioural economics into EV adoption strategy: Given that loss aversion and framing effects dominate consumer resistance (Wang et al., 2018); therefore, policy communication should emphasise relative gains.
4. Bridge theory and practice in policy design: Combining Prospect Theory with complementary models such as TPB can yield multi-layered strategies for behavioural change.

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