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Theoretical Mechanisms of How AI-Enabled Driver Assistance Systems Influence Consumers'Automobile Choice Behavior

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Abstract

This study develops a theoretical mechanism-based framework to explain how artificial intelligence (AI)-enabled driver assistance systems influence consumers' automobile choice behavior. While research on AI-enabled driver assistance has largely focused on engineering feasibility, system reliability, and safety performance, consumer research has not sufficiently theorized how AI systems' autonomy-related properties reshape consumers' cognitive evaluations and decision processes. Distinct from conventional vehicle attributes, AI-enabled driver assistance systems constitute intelligent socio-technical configurations that participate in driving decision-making, thereby introducing unique psychological concerns such as perceived autonomy, controllability, transparency, and responsibility ambiguity. Building on prior work in consumer choice, technology acceptance, and trust–risk theories, this study conceptualizes four key perceived attributes—perceived intelligence, perceived autonomy, perceived controllability, and perceived transparency—and argues that AI-enabled driver assistance affects automobile choice behavior primarily through mediated pathways of trust formation and risk/uncertainty appraisal. The framework further clarifies that the choice effects of AI-enabled driver assistance are not uniformly positive; rather, they depend on consumers' perceived trade-offs between anticipated technological benefits and psychological uncertainty. By theorizing AI-enabled driver assistance as an autonomy-bearing technology element in consumption contexts, the study extends consumer choice theorizing into AI settings, refines conceptual distinctions between objective technical capability and subjective perceived attributes, and offers an integrative mechanism model that can guide future empirical work and managerial practice in intelligent vehicle design and communication.

Keywords

AI-enabled driver assistance; consumer choice; perceived intelligence; perceived autonomy; perceived controllability; perceived transparency; trust in AI; risk perception; uncertainty

1. Introduction

1.1. Research Background

In recent years, with the rapid advancement of artificial intelligence (AI) technologies, their application scenarios have gradually expanded from traditional information-processing domains to the real economy and everyday life. Among these, the automotive industry is widely regarded as a key sector in which AI technologies can achieve deep integration and large-scale deployment. In particular, within the field of driver assistance systems, AI has progressively reshaped the technological attributes and usage patterns of automobiles through functional modules such as environmental perception, decision-making, and control execution. Driver assistance systems are no longer merely technical tools for enhancing driving safety; rather, they have increasingly evolved into important indicators of a vehicle's

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level of intelligence and now play an increasingly prominent role in consumers' automobile purchase decisions.

Against the backdrop of global transformation and upgrading of the automotive industry, the traditional competitive logic centered on powertrain performance, price, and brand is undergoing fundamental change. With the widespread adoption of intelligent configurations, consumers have begun to pay greater attention to the intelligent systems embedded in vehicles when making automobile choices, particularly AI-supported driver assistance functions. Some automakers have positioned driver assistance capabilities as key instruments for product differentiation and market competition, while related marketing communications have continuously emphasized the safety benefits, convenience, and sense of futurity brought about by AI technologies. This trend indicates that AI-enabled driver assistance systems are increasingly penetrating from the technological level into the consumer decision-making level, becoming an important factor influencing consumers' automobile choice behavior.

1.2. Research Problem Statement

Despite the substantial attention that AI-enabled driver assistance systems have received in industrial practice, existing research remains insufficient in explaining how such systems influence consumers' automobile choice behavior. On the one hand, research on AI-enabled driver assistance has largely been conducted from an engineering and technical perspective, focusing on system architecture, algorithm optimization, safety performance, and testing and validation. As a result, scholarly attention has predominantly concentrated on issues of technical feasibility and system reliability. On the other hand, although the consumer behavior literature has accumulated a wealth of research on product choice, technology adoption, and risk perception, most studies continue to treat traditional technologies or general information systems as their primary objects, without fully considering the autonomous decision-making properties of AI technologies and their implications for consumers' cognitive structures.

Unlike conventional automotive configurations, AI-enabled driver assistance systems are not single, static product attributes; rather, they are intelligent systems that possess a certain degree of autonomous judgment during operation. When confronted with such systems, consumers do not evaluate them solely on the basis of functional utility. Instead, they also form subjective judgments regarding the system's level of intelligence, controllability, reliability, and potential risks. These judgments not only shape consumers' perceptions of product value but also directly influence their attitudes toward vehicle choice and their final decision-making behavior. However, existing research still lacks a systematic theoretical framework capable of explaining how AI-enabled driver assistance systems affect consumers' automobile choice behavior through multiple cognitive and psychological mechanisms.

Accordingly, it is necessary to conduct a systematic theoretical review and mechanism-based analysis of the relationship between AI-enabled driver assistance systems and consumers' automobile choice behavior. Such analysis can clarify the pathways through which AI operates within consumer decision-making contexts and provide a more explanatory theoretical foundation for related research.

1.3. Research Objectives and Significance

Taking AI-enabled driver assistance systems as the research object and consumers' automobile choice behavior as the core focus, this study aims to systematically reveal—through theoretical analysis—the internal mechanisms by which AI-enabled driver assistance systems influence consumers' automobile choice behavior. Specifically, by integrating the technological attributes of AI, consumer choice theories, and theories related to trust and risk, this study seeks to construct a theoretical framework capable of explaining consumers' automobile choice decisions in the context of AI-enabled driver assistance.

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From a theoretical perspective, the significance of this study is reflected in three main aspects. First, by incorporating AI-enabled driver assistance systems into the research domain of consumer choice behavior, this study extends the applicability boundaries of traditional consumer choice theories, enabling them to better address decision-making characteristics in emerging intelligent technology contexts. Second, this study emphasizes consumers' subjective perceptions of AI systems rather than solely objective technical indicators, thereby deepening understanding of how constructs such as perceived intelligence, trust, and risk perception operate within AI contexts. Finally, by developing a mechanism-based theoretical framework, this study provides clear conceptual definitions and analytical pathways for future empirical research.

From a practical perspective, this study contributes to a deeper understanding of how consumers interpret and evaluate AI-enabled driver assistance systems, offering theoretical insights for automakers in areas such as intelligent configuration design, technology communication, and marketing strategy. At the same time, it provides reference value for the standardized application and responsible guidance of AI technologies in consumer markets.

2. Literature Review and Theoretical Foundations

2.1. Research on AI-Enabled Driver Assistance Systems

2.1.1. Conceptual Definition of AI-Enabled Driver Assistance Systems

AI-enabled driver assistance systems generally refer to technological systems that, during vehicle operation, rely on artificial intelligence algorithms to perceive, analyze, and interpret the surrounding driving environment, and to a certain extent participate in or substitute for drivers in executing driving decisions and control operations. Compared with traditional driver assistance functions, AI-enabled driver assistance systems place greater emphasis on learning capability, autonomous decision-making, and adaptability to complex traffic scenarios at the technological level.

Existing studies typically define driver assistance systems from an engineering and technical perspective, emphasizing their integrated system characteristics across the perception, decision-making, and execution layers. In this context, artificial intelligence technologies are mainly applied to key processes such as object recognition, environmental modeling, trajectory planning, and risk prediction, enabling driver assistance systems to exhibit a certain degree of "intelligent-like" performance. From a technical classification standpoint, current driver assistance systems are often regarded as important components of the automated driving technology framework, with their level of intelligence differentiated according to automation levels (SAE J3016，2018).

However, from the perspective of consumer research, technical functional classifications alone are insufficient to explain consumers' cognition and evaluation of AI-enabled driver assistance systems. In automobile purchase contexts, consumers do not directly engage with algorithmic architectures or technical details; instead, they form judgments based on subjective perceptions of overall system intelligence, safety, and controllability. Therefore, it is necessary to extend existing engineering-based definitions by incorporating a "consumer perspective," conceptualizing AI-enabled driver assistance systems as intelligent technological configurations characterized by autonomous decision-making features.

2.1.2. Evolution of Research Themes on AI-Enabled Driver Assistance Systems

A review of the existing literature indicates that research on AI-enabled driver assistance systems has broadly evolved from technical implementation to system reliability, and subsequently to social impact. Early studies primarily focused on technical issues such as algorithmic modeling, sensor fusion, and control system design, emphasizing the role of

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artificial intelligence in enhancing driving safety and operational efficiency . As the technology has gradually matured, scholarly attention has increasingly shifted toward system reliability, accident risk, and safety evaluation.

In recent years, some studies have begun to address the social acceptance of AI-enabled driver assistance systems, particularly public attitudes and perceptions toward automated driving and driver assistance technologies (Kyriakidis et al., 2015). These studies suggest that, despite rapid technological advancement, consumers' acceptance of AI-enabled driving systems is not determined solely by technical performance, but is significantly influenced by factors such as trust, risk perception, and responsibility attribution.

Overall, although existing research has generated relatively rich insights into the technological value of AI-enabled driver assistance systems, it still lacks systematic theoretical analysis explaining how such systems influence consumers' concrete automobile choice behavior. This gap creates room for re-examining AI-enabled driver assistance systems from a consumer choice perspective.

2.2. Research on Consumers' Automobile Choice Behavior

2.2.1. Classical Theoretical Foundations of Consumer Choice Behavior

Consumer choice behavior has long been a central research topic in the fields of management and consumer psychology. Classical consumer choice theories suggest that consumers integrate considerations of product attributes, price, risk, and personal preferences when making decisions under conditions of bounded rationality . In the context of automobile consumption, consumer choice is typically regarded as a high-involvement decision characterized by extended information search, heightened risk perception, and substantial decision-making costs.

In technology product contexts, researchers frequently employ the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) to explain consumers' intentions to adopt new technologies (Davis, 1989； Ajzen, 1991). Prior studies indicate that perceived usefulness and perceived ease of use are key determinants influencing consumers' technology adoption, while subjective norms and perceived behavioral control further shape final decision behavior.

However, these theories predominantly take information systems or general technological products as their research objects, implicitly assuming that the technology itself does not possess independent decision-making capability. With the introduction of artificial intelligence technologies, this assumption is increasingly challenged.

2.2.2. Automobile Choice Behavior in Consumption Contexts

In automobile consumption contexts, existing research typically analyzes consumers' choice behavior from dimensions such as brand cognition, price sensitivity, performance evaluation, and after-sales service. As the technological attributes of automotive products have continued to evolve, intelligent configurations have gradually become important factors influencing consumers' evaluations. Some studies have begun to examine the impact of intelligent driving, vehicle connectivity, and related technologies on consumers' purchase intentions, arguing that technological advancement can enhance consumers' overall value perceptions of products.

Nevertheless, it should be noted that most of this research still treats intelligent configurations as traditional "product attributes," with limited differentiation between artificial intelligence technologies and general electronic or information technologies. This limitation constrains the explanatory depth of such studies with respect to consumers' cognitive processes.

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2.3. Trust and Risk Theories in AI Contexts

2.3.1. Trust in Artificial Intelligence Systems

Trust is widely recognized as an important psychological mechanism influencing individuals' adoption of complex technological systems. In AI contexts, trust refers not only to whether a system is reliable, but also to individuals' judgments regarding algorithmic decision-making capability and value alignment. Existing research indicates that when technological systems possess a degree of autonomous decision-making capacity, the mechanisms through which users form trust differ significantly from those associated with traditional tool-based technologies (Dietvorst et al., 2015).

In driver assistance contexts, AI systems directly participate in driving decisions, and the potential consequences are highly consequential. As a result, consumer trust in such systems becomes particularly salient. Some studies have found that even when AI systems outperform human drivers in statistical terms, individuals may still exhibit avoidance tendencies due to anxiety stemming from the systems' lack of explainability (Longoni et al., 2019).

2.3.2. Risk Perception and Uncertainty Factors

Risk perception theory posits that consumers do not base decisions on objective risk levels, but rather on subjectively perceived risks . In AI-enabled driver assistance contexts, perceived risks extend beyond technical failure to include ambiguous responsibility attribution, transfer of control, and potential moral consequences.

Because the decision-making processes of AI-enabled driver assistance systems often involve a degree of opacity, consumers may find it difficult to accurately evaluate system behavior, thereby amplifying perceived uncertainty. Such uncertainty may weaken consumers' rational assessment of technological advantages and, consequently, influence their choice behavior.

2.4. Literature Assessment and Research Gaps

Synthesizing the above literature reveals that, although extensive progress has been made in the technical study of AI-enabled driver assistance systems and consumer choice research has developed relatively mature theoretical foundations, a significant research discontinuity remains between these two streams. Existing studies have not systematically explained how AI-enabled driver assistance systems influence consumers' automobile choice behavior through mechanisms related to cognition, trust, and risk judgment.

Specifically, the literature exhibits the following limitations. First, there is a lack of theoretical analysis that treats AI-enabled driver assistance systems as "technology elements with autonomous decision-making characteristics." Second, key concepts such as perceived intelligence, controllability, and responsibility attribution remain insufficiently defined. Third, there is an absence of an integrative framework that systematically combines AI technological attributes with consumer choice theories.

Based on these limitations, it is necessary to develop a systematic theoretical construction explaining the mechanisms through which AI-enabled driver assistance systems influence consumers' automobile choice behavior.

3. Constructing the Theoretical Mechanisms Through Which AI-Enabled Driver Assistance Systems Influence Consumers' Automobile Choice Behavior

3.1. Basic Analytical Logic

In the context of AI-enabled driver assistance, consumers' automobile choice behavior is no longer merely a comparison of traditional product attributes. Instead, it involves how consumers understand, evaluate, and establish a relationship with an intelligent technological

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system that possesses autonomous decision-making capabilities. Consequently, analysis of the influence of AI-enabled driver assistance systems on consumer choice must move beyond a single "function–utility" logic and focus on consumers' comprehensive cognitive and psychological judgments regarding artificial intelligence technologies.

This study argues that AI-enabled driver assistance systems do not exert a direct influence on consumers' automobile choice behavior. Rather, they first shape consumers' subjective perceptions of technological attributes, which then affect automobile choice behavior indirectly through mediating mechanisms such as trust formation and risk judgment. Based on this analytical premise, this chapter systematically defines the key perceived attributes of AI-enabled driver assistance systems and constructs a theoretical mechanism framework explaining how these systems influence consumers' automobile choice behavior.

3.2. Defining Key Perceived Attributes of AI-Enabled Driver Assistance Systems

3.2.1. Perceived Intelligence

Perceived intelligence refers to consumers' subjective evaluation of an AI-enabled driver assistance system's ability to make judgments, learn, and adapt in complex driving scenarios. Unlike traditional technological configurations, the value of AI-enabled driver assistance systems is not fully reflected in the presence of specific functions; rather, it lies in whether consumers perceive the system as "sufficiently intelligent" to generate appropriate decisions under complex and uncertain traffic conditions.

From the consumer perspective, perceived intelligence is typically formed through system performance, functional descriptions, and external information communication rather than through direct understanding of algorithmic principles. Higher perceived intelligence can enhance consumers' confidence in system capability, thereby improving their overall evaluation of vehicles equipped with such systems.

3.2.2. Perceived Autonomy

Perceived autonomy refers to consumers' subjective cognition of the extent to which an AI-enabled driver assistance system can independently make driving-related decisions during vehicle operation. A defining feature of AI-enabled driver assistance systems is their capacity to partially substitute for or assist human drivers in performing decision-making tasks. As a result, when choosing a vehicle, consumers are not merely selecting a technological tool; they are also deciding whether to delegate a portion of driving control to a technological system.

Higher perceived autonomy may generate both positive and negative effects. On the one hand, it can enhance consumers' perceptions of technological sophistication and futurity. On the other hand, it may trigger concerns regarding loss of control and responsibility transfer. Therefore, perceived autonomy exhibits a dual character within the theoretical mechanism.

3.2.3. Perceived Controllability

Perceived controllability refers to consumers' subjective judgment of whether an AI-enabled driver assistance system can be effectively understood, supervised, and intervened in. In AI contexts, consumers often find it difficult to fully comprehend system decision logic, making perceived controllability a critical factor influencing automobile choice behavior.

When consumers believe that AI-enabled driver assistance systems can be manually overridden or deactivated when necessary, and that their operation is sufficiently transparent, perceived controllability tends to be higher. This perception helps alleviate anxiety associated with system autonomy and can, to a certain extent, promote consumer acceptance and choice.

3.2.4. Perceived Transparency

Perceived transparency refers to consumers' subjective perception of whether the decision-making processes of an AI-enabled driver assistance system are clear and understandable.

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Because AI algorithms often exhibit "black-box" characteristics, consumers may be unable to directly comprehend the rationale behind system decisions, thereby generating uncertainty.

At the cognitive level, higher perceived transparency enhances perceived credibility and reduces psychological resistance stemming from non-explainability. Within the theoretical mechanism, perceived transparency primarily influences consumers' trust formation processes.

3.3. The Mediating Role of Trust and Risk in the Theoretical Mechanism

3.3.1. Trust Mechanisms in AI-Enabled Driver Assistance Systems

In the context of AI-enabled driver assistance, trust refers not only to consumers' recognition of system performance stability, but also to their comprehensive judgment of the rationality and safety of system decision-making. Compared with traditional technological products, AI-enabled driver assistance systems directly participate in driving decisions, and the potential consequences are high-stakes, making trust particularly salient in consumers' automobile choice behavior.

This study posits that consumers' trust in AI-enabled driver assistance systems is jointly shaped by multiple cognitive factors, including perceived intelligence, perceived controllability, and perceived transparency. When consumers perceive the system as highly capable, controllable, and understandable, their trust is more likely to increase, thereby strengthening their willingness to choose vehicles equipped with such systems.

3.2 Risk Perception and Uncertainty Constraints

Corresponding to trust, risk perception constitutes an important constraining mechanism influencing consumer choice behavior. In AI-enabled driver assistance contexts, consumers face not only risks related to technical failure, but also risks associated with ambiguous responsibility attribution, transfer of control, and potential moral consequences.

Moreover, because the operational outcomes of AI-enabled driver assistance systems exhibit a degree of unpredictability, consumers may find it difficult to form stable expectations regarding long-term system performance, thereby amplifying perceived uncertainty. Such uncertainty can weaken consumers' positive evaluations of technological advantages and may, under certain conditions, offset the favorable effects of perceived intelligence.

3.4. Integrating the Theoretical Mechanism

Based on the preceding analysis, this study argues that the influence of AI-enabled driver assistance systems on consumers' automobile choice behavior is neither linear nor direct, but rather occurs indirectly through a series of cognitive and psychological mechanisms. Specifically, the key perceived attributes of AI-enabled driver assistance systems shape consumers' comprehensive cognition of system intelligence, autonomy, controllability, and transparency. On this basis, consumers form value judgments through processes of trust formation and risk evaluation, which ultimately manifest in automobile choice behavior.

This theoretical mechanism emphasizes that consumers' automobile choice behavior in AI-enabled driver assistance contexts is fundamentally a trade-off between potential technological advantages and psychological uncertainty. AI technologies do not necessarily produce uniformly positive choice effects; instead, the direction and magnitude of their influence depend on how consumers understand and evaluate the technological system.

3.5. Research Propositions

Based on the above theoretical analysis, this study proposes the following research propositions to conceptually summarize the mechanisms through which AI-enabled driver assistance systems influence consumers' automobile choice behavior.

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Proposition 1: The higher consumers' perceived intelligence of AI-enabled driver assistance systems, the stronger their tendency to choose vehicles equipped with such systems.

Proposition 2: Consumers' trust in AI-enabled driver assistance systems mediates the relationship between perceived intelligence and automobile choice behavior.

Proposition 3: Consumers' perceived risk and perceived uncertainty inhibit the choice effects of AI-enabled driver assistance systems.

Proposition 4: Perceived controllability and perceived transparency mitigate negative cognitive effects associated with system autonomy and indirectly strengthen consumers' automobile choice behavior.

These propositions provide a systematic theoretical abstraction for understanding how AI-enabled driver assistance systems influence consumers' automobile choice behavior and offer clear directions for future empirical research.

4. Theoretical Contributions, Practical Implications, and Future Research Directions

4.1. Theoretical Contributions

This study develops a theoretical analysis of the mechanisms through which AI-enabled driver assistance systems influence consumers' automobile choice behavior. By integrating the technological attributes of artificial intelligence with consumer choice research, the study constructs a relatively systematic explanatory framework. Its theoretical contributions are primarily reflected in the following aspects.

First, this study explicitly incorporates AI-enabled driver assistance systems into the research domain of consumer choice behavior, thereby extending the applicability of traditional consumer choice theories. Existing research in this domain has largely focused on conventional product attributes such as price, brand, and functional configuration, often treating technology as an instrumental or auxiliary element. This study argues that AI-enabled driver assistance systems are not merely technical configurations in the conventional sense, but intelligent systems endowed with a certain degree of autonomous decision-making capability. Their introduction fundamentally alters the interaction relationship between consumers and products. By advancing this conceptualization, the study provides a new theoretical perspective for understanding consumer behavior in artificial intelligence contexts.

Second, from a consumer cognition perspective, this study systematically defines the key perceived attributes of AI-enabled driver assistance systems, including perceived intelligence, perceived autonomy, perceived controllability, and perceived transparency. These constructs do not simply restate technical indicators, but rather represent theoretical abstractions of consumers' subjective understanding structures. By distinguishing between objective technological capability and consumer-perceived attributes, this study addresses the relative neglect of psychological mechanisms in prior research and deepens theoretical understanding of how consumers cognitively process AI technologies.

Third, this study constructs a mechanism-based explanatory framework centered on trust and risk perception, revealing the internal logic through which AI-enabled driver assistance systems influence consumers' automobile choice behavior. Unlike approaches that directly link technological characteristics to choice outcomes, this study emphasizes that consumers do not passively accept technological advantages. Instead, they make decisions through processes of trust formation and risk trade-offs. This mechanism-oriented explanation contributes to a more nuanced understanding of the complexity of AI's influence on consumer decision-making.

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4.2. Practical Implications

Although this study adopts a primarily theoretical research approach, its findings offer several practical implications.

First, for automobile manufacturers, the results suggest that the market value of AI-enabled driver assistance systems does not depend solely on their technical performance. Rather, it is largely shaped by how consumers interpret and evaluate these systems. In addition to advancing driver assistance technology development, firms should place greater emphasis on the communication of technological information. By enhancing the perceived transparency and controllability of AI-enabled driver assistance systems, manufacturers can facilitate trust formation and improve the overall attractiveness of their products.

Second, with respect to marketing communication and consumer engagement related to intelligent vehicles, this study indicates that simply emphasizing the technological sophistication or automation level of AI-enabled driver assistance systems may not effectively increase consumers' choice intentions. Excessive emphasis on system autonomy may even heighten consumers' concerns about risk and loss of control. Therefore, marketing strategies should balance the presentation of technological advantages with clear communication regarding safety mechanisms, responsibility attribution, and the availability of human intervention.

Third, from a broader perspective on AI application, the analytical logic developed in this study can be extended to other consumer-facing AI products that exhibit autonomous decision-making characteristics. By focusing on consumers' perceived structures toward intelligent systems, both researchers and practitioners can gain a more comprehensive understanding of the acceptance and diffusion mechanisms of AI technologies in consumer markets.

4.3. Research Limitations and Future Research Directions

Despite the systematic theoretical analysis presented in this study, several limitations remain and point to avenues for future research.

First, this study develops a conceptual mechanism framework through theoretical reasoning and does not empirically test the proposed research propositions. Future studies may build on this framework by employing empirical methods such as surveys, experiments, or interviews to validate the proposed relationships and enhance external validity.

Second, the analysis in this study is conducted from a general consumer perspective and does not explicitly account for heterogeneity among consumers in terms of technological cognition, risk preference, and prior usage experience. Future research may incorporate consumer heterogeneity to examine how different consumer segments respond to AI-enabled driver assistance systems and how choice mechanisms vary across groups.

Third, as AI-enabled driver assistance technologies continue to evolve, their functional boundaries and application scenarios are likely to change. Future research may incorporate dynamic factors such as increasing levels of automation and evolving human–machine collaboration modes, and adopt longitudinal research designs to explore how consumers' automobile choice behavior adapts over time.

5. Conclusion

This study takes AI-enabled driver assistance systems as its focal research object and systematically examines, from a theoretical perspective, the mechanisms through which such systems influence consumers' automobile choice behavior. By integrating the technological attributes of artificial intelligence, consumers' cognitive structures, and theories of trust and

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risk, this study constructs a theoretical framework that explains how AI-enabled driver assistance systems shape consumers' automobile choice decisions.

The analysis suggests that AI-enabled driver assistance systems do not influence consumer choice primarily by directly enhancing functional utility. Instead, their influence operates through reshaping consumers' perceptions of key system attributes—namely perceived intelligence, perceived autonomy, perceived controllability, and perceived transparency. These perceptions, in turn, affect consumers' trust formation and risk and uncertainty assessments, which ultimately shape their automobile choice behavior. In this sense, consumers' choices in AI-enabled driver assistance contexts reflect a process of weighing potential technological advantages against psychological uncertainty.

By developing a mechanism-based theoretical framework, this study contributes to a more nuanced understanding of consumer choice behavior in artificial intelligence contexts. It extends traditional consumer choice theory by explicitly incorporating AI systems characterized by autonomous decision-making and highlights the importance of perception-based mechanisms in explaining consumer responses to intelligent technologies. Moreover, the study offers a conceptual foundation for examining the broader societal implications of AI adoption in consumer markets.

As artificial intelligence continues to deepen its integration into the automotive industry, the influence of AI-enabled driver assistance systems on consumer behavior is likely to become increasingly complex and multifaceted. Future research that builds upon the theoretical framework proposed in this study may further elucidate the evolving interaction between intelligent technologies and consumer decision-making, thereby advancing both theoretical development and practical understanding in this rapidly growing research domain.

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