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Article

Mapping the literature of electric vehicle purchase intention and consumer behavior: A bibliometric analysis of Scopus database (2010–2023)

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Abstract: This study systematically examines the literature of electric vehicle (EV) purchase intention and consumer behavior using a bibliometric method to unveil three main research questions: 1) identifying influential publications, authors, and journals; 2) analyzing the thematic evolution of research over time; and 3) identifying emerging research directions. The main objective is to provide a comprehensive understanding of the current state of knowledge and to guide future research in this evolving field. A comprehensive bibliometric analysis was conducted, using Scopus statistics analysis, R-Studio Biblioshiny and VOSviewer, comprising 687 publications authored by 1743 researchers representing 34 different countries with the dataset sourced from the Scopus database from 2010 to 2023. To achieve a nuanced understanding of the research landscape, a multifaceted approach was adopted, including detailed citation analysis, author co-citation analysis, keyword analysis, and thematic mapping. Through meticulous analysis, this study identifies the most influential publications, authors, and journals in the domain of EV purchase intentions and consumer behaviors. It also traces the evolution of themes over time and identifies emerging research directions, providing valuable insights into the trajectory and future avenues of inquiry within this field. The findings contribute to a deeper understanding of the dynamics shaping research in the realm of EVs. The insights gained contribute significantly to advancing knowledge in this crucial domain, offering theoretical insights and practical implications for policymakers, businesses, manufacturers, and academics.

Keywords: electric vehicle; purchase intention; consumer behavior; bibliometric analysis; EV adoption

1. Introduction

The global average surface temperature has experienced a rise of approximately 2 degrees Fahrenheit (equivalent to 1 degree Celsius) since the pre-industrial period spanning from 1880 to 1900 (Climate, 2023). The escalation in the global mean surface temperature is predominantly attributed to anthropogenic activities, specifically the release of greenhouse gases, such as carbon dioxide (CO_2), through the combustion of fossil fuels (NASA, 2023). In response to the urgent need to address climate change and mitigate the adverse effects of greenhouse gas emissions, electric vehicles (EVs) are globally recognized as a key solution for reducing emissions and advancing sustainable transportation, offering a transformative approach to address environmental and economic challenges posed by traditional gasoline vehicles (Boudet, 2019; Dillman et al., 2020). To attain enduring climate mitigation goals, specialists in the transportation sector suggest that, by 2050, around 80% to 90% of newly acquired automobiles ought to generate zero greenhouse gas emissions from their exhaust systems (Axsen et al., 2017; McCollum and Yang,

2009). Therefore, understanding consumer purchase intention and behavior is crucial for the widespread adoption of EVs globally (Degirmenci and Breitner, 2017; He et al., 2018; Huang and Ge, 2019). To systematically explore these aspects, this study is carried out by adhering to the Prisma 2020 protocol (Page et al., 2021), structured with an introduction, literature review, methodology, results, discussion, along with conclusion and limitations.

2. Literature review

EVs, powered by electric motors and use rechargeable batteries as their primary source of energy (Sabri et al., 2016), are considered an alternative to conventional vehicles due to their low emissions and high energy efficiency (Hadboul and Ali, 2022; Rajole et al., 2021; Rallabandi et al., 2018). Including hybrid electric vehicles (HEVs), battery electric vehicles (BEVs), and plug-in hybrid electric vehicles (PHEVs), EVs are considered a critical driving force for the green economy and have attracted significant research effort recently (Li et al., 2015). Governments worldwide are actively formulating policies to promote widespread EV deployment, with the overarching goals of reducing energy consumption and greenhouse gas emissions (Gamallo et al., 2013). Notably, China currently dominates the EV market, followed by Europe and the USA (Suprobowati et al., 2022).

Recent research in the EV domain has witnessed a commendable shift towards encompassing broader aspects beyond solely technical considerations. Sustainability (Kelly et al., 2015; Lennox et al., 2020; Luo and Qiu, 2020; Ziemba, 2021), social and environmental impacts (Hawkins et al., 2012, 2013; Oliveira et al., 2015), and life cycle cost analyses (Diao et al., 2016; Kara et al., 2017; Mustapa et al., 2020) are increasingly being explored. While existing literature offers valuable insights into EV research, a significant portion predominantly reflects the perspectives of developed economies (Senyapar et al., 2023; Moon, 2021).

Furthermore, consumer behavior towards EVs has been scrutinized across diverse regions, highlighting the need for a more inclusive and comprehensive understanding. Investigations conducted in Turkey (Senyapar et al., 2023), China (Zang et al., 2022), Indonesia (Rizq Atika Maso and Tengku Ezni Balqiah, 2022), and India (Jayasingh et al., 2021) delve into factors such as consumer innovativeness, brand identity, perceived risk, and perceived value that influence purchase intentions towards EVs. Moreover, research has ventured into predicting purchase intentions within specific markets, such as Indonesia (Febransyah, 2021) and India (Dixit and Singh, 2022).

However, the existing literature on EV purchase behavior highlights several significant gaps, particularly in understanding the disparity between ethical purchase intentions and actual buying behaviors (Rezvani et al., 2015). Studies have not thoroughly examined the factors influencing consumers' green purchasing decisions (Vazifehdoust et al., 2013), sustainable EV consumption (Afroz et al., 2015), or battery EV adoption (Hackbarth and Madlener, 2013). Additionally, research on behavioral intentions towards full EVs (Lai et al., 2015), consumer purchase behaviors for EVs (Tu and Yang, 2019), and intentions towards environmentally friendly vehicles (Morganti and Browne, 2018), remains limited. Besides, the

dynamics of environmental consciousness and green purchase behavior are not well understood (Mishal et al., 2017), and the factors influencing the adoption of electric vans are under-researched (Shim et al., 2018).

With continuous advancements in EV technology and the rapid proliferation of research in this field over the past decade, an up-to-date review is warranted. To gain a deeper understanding of the current state of knowledge and identify promising research directions, a comprehensive bibliometric analysis is employed within this study. This analysis serves as a foundation for the subsequent exploration of the intersection between purchase intentions and consumer behaviors of EVs. This study addresses the following research questions (RQ) to comprehensively understand the EV research domain:

RQ1: What are the most influential publications, authors, and journals of this research area?

RQ2: What is the thematic evolution of research over time, including emerging topics and research clusters?

RQ3: What are the emerging research directions that warrant further investigation?

3. Methodology

Academic literature is widely available through various databases, including but not limited to Web of Science (Clarivate Analytics, 2024), Google Scholar (Google Scholar, 2024), ScienceDirect (Elsevier, 2024), ResearchGate (ResearchGate, 2024), and Scopus (Elsevier, 2024). Given the specific focus and scope of our study, Scopus is used as the primary database due to its extensive coverage, credibility, and comprehensive nature (Kabil et al., 2021). Scopus is also recognized for its suitability in bibliometric analysis across diverse disciplines, providing a reliable basis for such studies (Aysan and Nanaeva, 2022; Gao et al., 2021). This study selects 2010 as the starting year for the literature search due to its significance in the global EV industry, marked by the 25th World Battery, Hybrid and Fuel Cell Electric Vehicle Symposium and Exhibition (EVS25) in Shenzhen (Chuan, 2011). Additionally, 2010 saw the introduction of numerous policies worldwide to promote EV development, making it a pivotal year for the industry.

In the analysis performed for English language articles, Business Management and Accounting, Social Science, publications containing the words “adoption OR purchase AND intentions OR consumer OR costumer OR buyer OR behaviors AND electric AND vehicle OR ev OR car”. The year range is set from 2010 to 2023. The search commands automatically generated by Scopus are as follows: TITLE-ABS-KEY (adoption OR purchase AND intentions OR consumer OR costumer OR buyer OR behaviors AND electric AND vehicle OR ev OR car) AND PUBYEAR > 2009 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”)) AND (LIMIT-TO (SUBJAREA, “BUSI”) OR LIMIT-TO (SUBJAREA, “SOCI”)). As a result of the scanning, 687 articles were found.

To comprehensively analyze these articles on EV purchase intentions and consumer behaviors, this study utilizes a multifaceted bibliometric approach by utilizing Scopus statistics analysis, VOSviwer and R-Studio Biblioshiny, which

encompasses initial analysis, citation analysis, author analysis, geographical analysis, thematic analysis, and keyword analysis. By analyzing publication patterns and citation networks, researchers can gain insights into the most researched topics and the evolution of research over time (Geissdoerfer et al., 2017; Zou and Sun, 2021), navigate the vast amount of literature available and identify gaps or areas for further exploration (Furstenau et al., 2021). Subsequently, a multifaceted bibliometric approach of the Prisma 2020 protocol by Page et al. (2021) was utilized to shed light on regional differences and identify research gaps, setting future research agendas, and guiding strategic decision-making in the field of EV adoption, to explore opportunities for interdisciplinary collaboration and knowledge exchange in this field.

4. Results

This section presents the results of the bibliometric analysis of EV purchase intention and consumer behavior literature published during the period of the study. The analysis encompasses initial analysis, citation analysis, author analysis, geographical analysis, and thematic analysis, employing keyword visualization techniques.

4.1. Initial analysis

Table 1 reveals 687 articles published in this domain between 2010 and 2023, indicating a growing interest. On average, each paper had 3.25 authors, suggesting moderate collaboration typical for this field. However, authors contributed only 0.31 papers each during this period, indicating the time-consuming nature of research. The total citation counts of 28,503, averaging 2035.93 citations per year and 41.49 citations per paper, underscores the significant impact of research in this field. Overall, the statistics suggest a vibrant and impactful research environment.

Table 1. Citation metrics.

Description	Results
Publication years	2010–2023
Citation years	14(2010–2024)
Sources (Journals, Books, etc.)	187
Papers	687
Keywords Plus (ID)	2850
Author's Keywords (DE)	1928
Authors	1743
Authors of single-authored docs	50
Single-authored docs	52
Co-Authors per Doc	3.26
International co-authorships %	24.89
Keywords Plus (ID)	2850
Citations	28,503
Cites/year	2035.93

Table 1. (*Continued*).

Description	Results
Cites/paper	41.49
Cites/author	10,363.49
Papers/author	261.27
Authors/paper	3.25
h-index	88
g-index	141
hI,norm	51
hI,annual	3.64
hA-index	28
Papers with ACC ≥ 1,2,5,10,20:577,508,335,184,67	

Source: Author's analysis using Biblioshiny (2024).

Figure 1 reveals a discernible upward trend in research activity after 2015. Prior to this period, scholarly interest in the field appears to have been modest. This surge in research output can be linked to the international community's growing emphasis on environmental sustainability, particularly following the adoption of the Paris Agreement in 2015. This landmark agreement spurred stricter environmental regulations worldwide, prompting a heightened focus on the development and implementation of sustainable transportation solutions, including EVs.

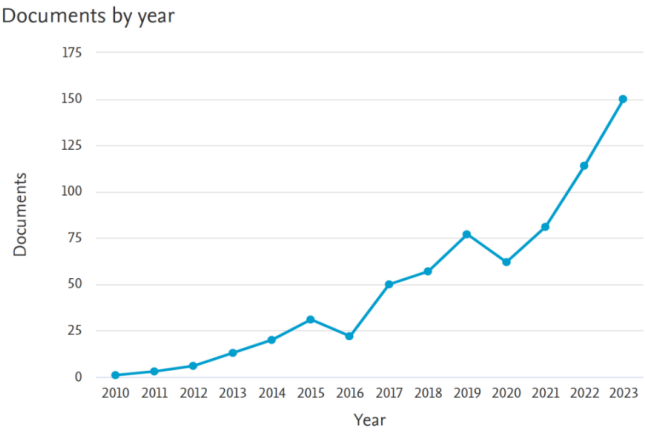


Figure 1. Global annual publications.
(Source: Scopus (Elsevier, 2024)).

As the popularity of EVs grows, research on purchase intentions and consumer behaviors has flourished across fields and industries. **Figure 2** depicts a vibrant research landscape. Social Science (27.7%) dominates, focusing on psychological factors influencing EV consumer decisions. Engineering (18.1%) emphasizes technological advancements' impact on adoption. Environmental Sustainability (14.8%) reflects concern for eco-friendly transportation. Business Management (12.9%) and Energy (9.7%) contribute insights into market dynamics and energy consumption patterns. This distribution highlights the multidisciplinary nature of EV research beyond technical aspects.

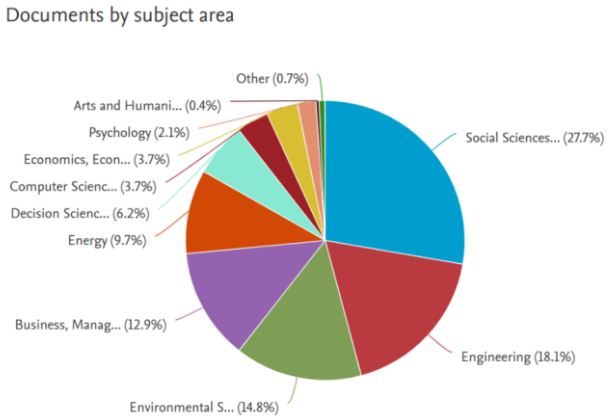


Figure 2. Documents by subject area.
(Source: Scopus (Elsevier, 2024)).

Figure 3 further identifies the leading sources of scholarly publications concerning EV purchase intentions and consumer behaviors. Transportation Research Part D: Transport and Environment (2024) takes the forefront, reflecting its specialization in the environmental and social aspects of transportation, making it a natural fit for EV-related research. Sustainability (Switzerland) (2024) aligns with the growing emphasis on environmentally sustainable practices and consumer choices. Transportation Research Part A: Policy and Practice (2024) highlights the crucial role of policy interventions and infrastructure development in shaping consumer behavior towards EVs.

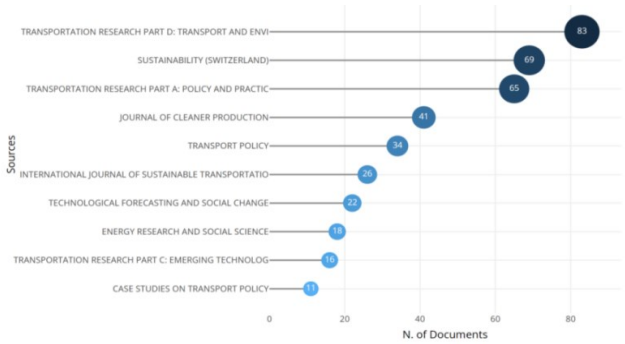


Figure 3. Most relevant sources.
(Source: Author's analysis using Biblioshiny (2024)).

4.2. Citation analysis

Citation analysis, a cornerstone of bibliometrics, leverages citation data to gauge the significance of research endeavors (Ahmad et al., 2019). This technique allows for the measurement of research output and quality at individual, group, and institutional levels to assess research productivity (Mian et al., 2020). By examining patterns of co-citation, researchers can gain insights into the intellectual structure of specific fields (Nerur et al., 2008), and identify influential scholarship by aiding in pinpointing highly cited articles, authors, and emerging research trends across diverse disciplines (Ahmad et al., 2019; Jin et al., 2019; Nerur et al., 2008). It is crucial to acknowledge that the correlation between citation count and research usage can vary across disciplines due to local citation practices (Pastva et al., 2018).

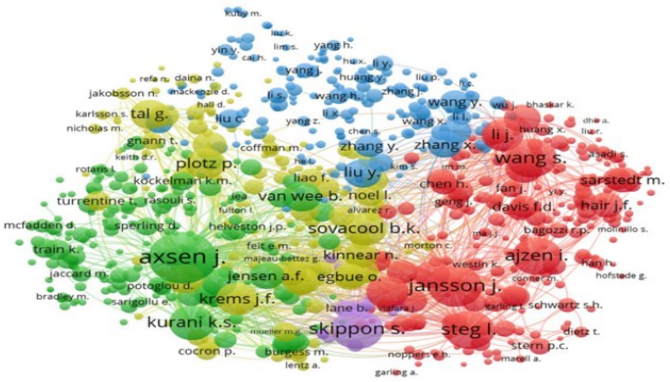
This study leverages co-citation network analysis to integrate scholarly articles from diverse sources. As illustrated in **Table 2**, data from 2023 reveals a significant trend. China has emerged as the leading contributor in terms of total citations, garnering 5216 citations. Compared to 2022, the gap between China and the United States (4056 citations) has shrunk considerably, indicating China's rapid research output growth. Notably, Europe maintains a strong foothold in scientific research. Five European nations — the United Kingdom, Germany, the Netherlands, Norway, and Denmark — rank among the top 10 most cited countries. The inclusion of India and South Korea alongside China in the top ranks underscores the burgeoning research productivity within Asian countries.

Table 2. Top 10 most cited countries.

Country	Total Citation	Average Article Citations
CHINA	5216	41.40
USA	4056	42.70
UNITED KINGDOM	1983	64.00
GERMANY	1427	59.50
NETHERLANDS	1178	78.50
INDIA	989	20.60
NORWAY	976	97.60
CANADA	887	35.50
DENMARK	867	108.40
KOREA	744	21.30

Source: Author's compilation using Biblioshiny (2024).

Figure 4 visualizes the co-citation network constructed from the analyzed data. This network comprises 792 distinct elements grouped into 4 clusters, with a total of 251,731 connecting links and a collective link strength of 2,207,692. Notably, the high density of connections within the network suggests a substantial degree of interconnectedness among researchers in this field.


axsen j.
jansson j.
sovacool b.k.
steg l.
skippon s.
kurani k.s.
krems j.f.
jensen a.f.
egbue o.
kinnear n.
ajzen i.
wang s.
li j.
zhang x.
zhang y.
liu y.
plotz p.
van wee b.
noel l.
sarstedt m.
hair j.f.
davis f.d.
bagozzi r.
tal g.
liu c.
train k.
sperling d.
helveston j.p.
potoglou d.
jaccard m.
kockelman k.m.
turrentine t.
ghanem t.
coffman m.
cocron p.
stern p.c.
dietz t.
schwartz s.h.
hofstede g.
fishbein m.
ajzen i.
chen n.
liao f.
wang y.
zhang j.
li s.
yang h.
huang y.
li y.
wang h.
yang j.
yin y.
liu x.
li l.
chen x.
wang x.
yang z.
li x.
zhang l.
li p.
wu j.
bhaskar k.
zhang x.
liu l.
fan j.
yu
geng j.
alvarez r.
fulton l.
morton c.
westin k.
connelly m.
lane b.
yadav r.
nopparat n.
garling a.
lentz a.
burgess m.
mueller m.g.
majeau-bettez g.
felt e.m.
sarigollu e.
bradley m.
nicholas m.
karlsson s.
jakobsson n.
refa n.
daina n.
hall d.
mackenzie d.
mcfadden d.
rotem-mindali o.
keith d.r.
kuhfuss l.
kuhn m.
linss.
yang h.
cath.
hua x.
li y.
liu p.
zhang j.
wang y.
li l.
li x.
chen x.
wang x.
yang z

interconnectedness within the co-citation network. Jansson j. emerges as the leading researcher, boasting 787 links and 51,595 total citations, which is closely followed by axsen J. with a similar publication count (787) and a slightly lower total citation count (51,133). Skippon s. secures the third position with 787 publications and 38,708 total citations. Notably, skippon exhibits a higher average citation count (65.9) compared to jansson (65.8) and axsen (65.2). Besides, the table further provides details regarding their affiliations and primary research areas.

Table 3. Top 10 researchers by author co-citation analysis.

Items	Cluster	Links	Total Link Strength	Citations
jansson j.	1	787	51,595	373
axsen j.	2	787	51,133	523
skippon s.	5	787	38,708	360
wang s.	1	785	38,634	353
steg l.	1	781	34,292	346
ajzen i.	1	778	30,803	334
krems j.f.	4	787	30,663	240
kurani k.s.	2	783	29,619	303
sovacool b.k.	4	787	29,168	283
anable j.	1	785	28,526	267

Source: Author's compilation by VOSviewer (2024).

Figure 5 summarizes the co-citation analysis, featuring 267 distinct elements grouped into 4 clusters, with 15,974 connecting links and a total link strength of 343,434. "energy policy" emerges as the central theme with the highest number of links (264) and total link strength (55,405), showcasing its prominence in energy policy research. "sustainability" and "energy" also exhibit relevance, while "transportation" themes connect to energy policy, albeit with less focus. "j. clean prod." influences environmental research intersecting with energy policy, and "transp. policy" demonstrates high total link strength, sourced from influential citations within the field.

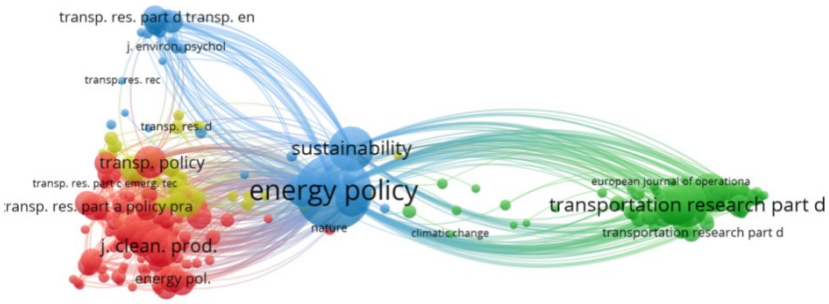


Figure 5. Bibliometric resource co-citation analysis.
(Source: Author's analysis using VOSviewer (2024)).

Table 4 presents the top 10 cited publications and provides information on the title, source, GS Rank, Citation count, Cites/Year, practical implications, and limitations/gaps for each publication.

Table 4. Top 10 cited publications.

References	Documents	Source	GS Rank	Citation	Cites/Year
Rezvani et al. (2015)	Advances in consumer electric vehicle adoption research: A review and research agenda	Transportation Research Part D: Transport and Environment	655	781	86.78
Graham-Rowe et al. (2012)	Mainstream consumers driving plug-in battery-electric and plug-in hybrid electric cars: A qualitative analysis of responses and evaluations	Transportation Research Part A: Policy and Practice	662	486	40.5
Wang et al. (2016)	Predicting consumers' intention to adopt hybrid electric vehicles: using an extended version of the theory of planned behavior model	Transportation	665	464	58
Carley et al. (2013)	Intent to purchase a plug-in electric vehicle: A survey of early impressions in large US cites	Transportation Research Part D: Transport and Environment	661	450	40.91
Liao et al. (2017)	Consumer preferences for electric vehicles: a literature review	Transport Reviews	503	403	57.57
Jensen et al. (2013)	On the stability of preferences and attitudes before and after experiencing an electric vehicle	Transportation Research Part D: Transport and Environment	677	386	35.09
Bjerkan et al. (2016)	Incentives for promoting Battery Electric Vehicle (BEV) adoption in Norway	Transportation Research Part D: Transport and Environment	669	385	48.13
Plötz et al. (2014)	Who will buy electric vehicles? Identifying early adopters in Germany	Transportation Research Part A: Policy and Practice	625	375	37.5
Helveston et al. (2015)	Will subsidies drive electric vehicle adoption? Measuring consumer preferences in the U.S. and China	Transportation Research Part A: Policy and Practice	649	346	38.44
Wu et al. (2015)	Electric vehicles' energy consumption measurement and estimation	Transportation Research Part D: Transport and Environment	607	345	38.33

Source: Author's compilation using Biblioshiny (2024).

4.3. Author analysis

Table 5. Author document counting for top 10 authors.

Author Names	Number of Documents
Axsen, J.	12
Tal, G.	9
Hardman, S.	7
Higueras-Castillo, E.	7
Timmermans, H.	7
Wang, S.	7
Li, L.	6
Qian, L.	6
Sovacool, B.K.	6
Liébana-Cabanillas, F.	5

Source: Author's analysis using Biblioshiny (2024).

Common author analysis helps researchers gain valuable insights into collaboration patterns, emerging research trends and knowledge dissemination

(Glänzel, 2001; Newman, 2004). **Table 5** lists the top 10 authors by the number of documents published. The author with the most publications (Axsen, J.) has 12 documents, followed by Tal, G. (9 documents). There is a tie for the third-most published author (Tal, G. and Hardman, S., Higueras-Castillo, E., Timmermans, H., and Wang, S.) with 7 documents each. The remaining authors have between 6 and 5 published documents.

As shown in **Table 6**, the use of academic metrics such as the h-index, g-index, m-index, total citations (TC), number of publications (NP), and the starting year of publication (PY_start) serves as a valuable approach to measure an author's academic impact and influence. Using both the h-index and g-index can assess citation impact, applicable to individuals, departments, institutions, and even publications themselves (Bontis and Serenko, 2000; Harzing and Wal, 2009; Hu et al., 2018).

Table 6. Authors' local impact.

Element	h_index	g_index	m_index	TC	NP	PY_start
AXSEN J	9	12	0.692	461	12	2012
WANG Z	9	9	1.125	567	9	2017
LI L	8	9	1.143	263	9	2018
HARDMAN S	7	7	0.778	496	7	2016
TAL G	7	9	1.167	349	9	2019
TIMMERMANS H	7	7	0.636	370	7	2014
WANG S	7	9	0.778	1170	9	2016
HIGUERAS-CASTILLO E	6	7	1	200	7	2019
LI J	6	8	0.75	666	8	2017
LI X	6	6	0.5	183	6	2013

Source: Author's analysis using Biblioshiny (2024).

Regarding **Figure 6**, the data suggests that 2017, 2019, and 2020 were the most productive years for research on EV purchase intentions and consumer behavior among the top 10 researchers. This surge in research activity could potentially be attributed to policy and incentive shifts, technological advancements, heightened media attention and academic conferences and projects.

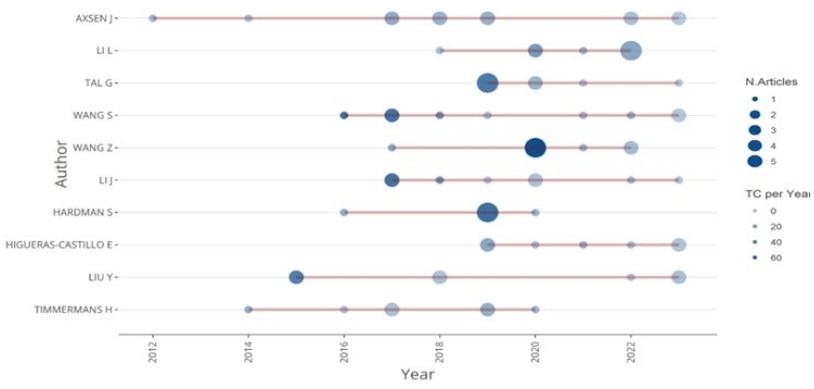


Figure 6. Authors' production over time.

(Source: Author's analysis using Biblioshiny (2024)).

4.4. Geographical analysis

Geographical analysis is a methodological approach to study spatial patterns, relationships, and trends within different geographic regions (Catherine et al., 2018), and gain insights into complex geographical phenomena and spatially explicit (Singleton and Arribas-Bel, 2021). The chart (**Figure 7**) visually portrays the distribution of research documents of most relevant countries by corresponding author. Rectangular bars represent the number of documents for each country. The tallest bar corresponds to China, indicating the most significant research output from that country in the dataset, followed by the USA, India, Korea, and the UK.

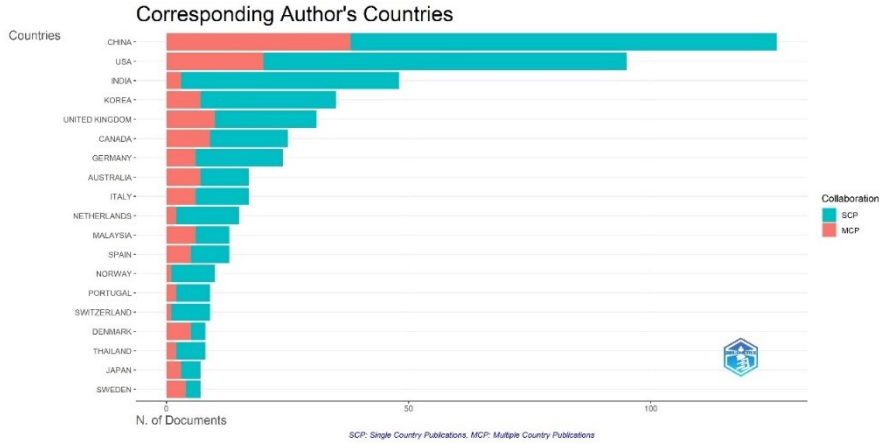


Figure 7. Most relevant countries by corresponding author.
(Source: Author's analysis using Biblioshiny (2024)).

According to the countries' collaboration world map (**Figure 8**), the connections are between Asia, North America, Europe, and Australia. The current reality is that Asia and the USA as the most important markets for EVs (Ajanovic, 2015). Europe has emerged as a significant market for EV sales, reflecting the global shift towards sustainable transportation solutions (He, 2023), followed by Australia.

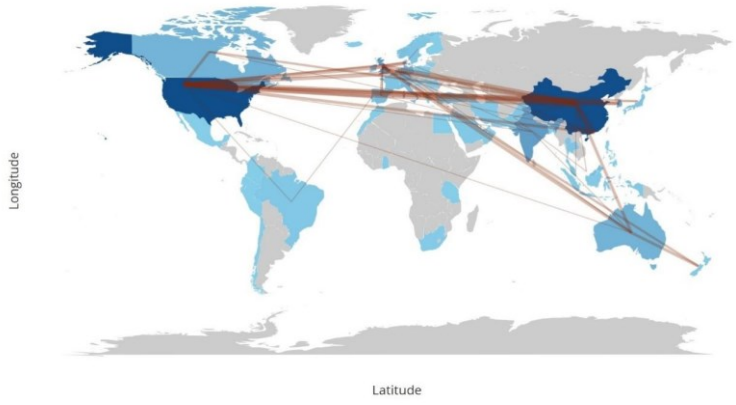


Figure 8. Countries' collaboration world map.
(Source: Author's analysis using Biblioshiny (2024)).

4.5. Keyword analysis

Keywords analysis offers valuable insights into specific research areas by utilizing keyword co-occurrence analysis to map clusters of keywords and highlight

advancements in the field (Ehri et al., 2009; Klochkov et al., 2015; Statsenko et al., 2023), providing focused insights into mathematics and futures contracts (Kim and Kim, 2021). In **Figure 9**, the total number of items is 327 of 8 clusters, with 15,158 links and 32,206 strength links in total, which shows the topic of EV is gaining quiet amount of interest in the research field of social science and business management.

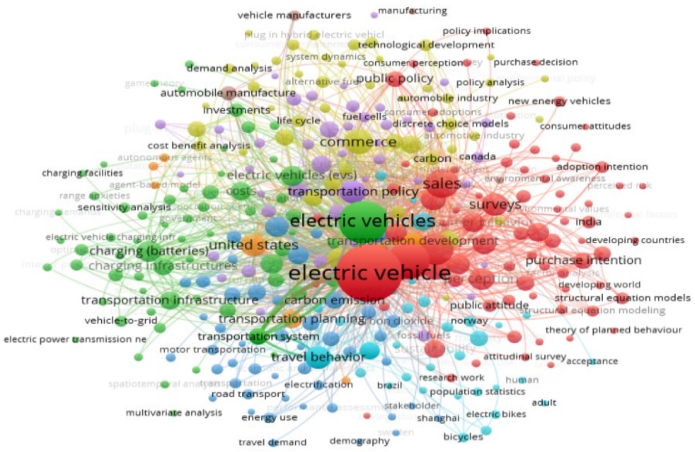


Figure 9. Overlay visualization of index keywords analysis.
(Source: Author's analysis using VOSviewer (2024)).

Table 7. Top 20 items of index keywords analysis.

Items	Cluster	Links	Total Link Strength	Occurrences
electric vehicle	1	325	3927	381
electric vehicles	2	309	2227	202
technology adoption	1	302	1588	146
consumption behavior	1	282	1277	114
sales	1	272	1200	101
commerce	4	261	983	73
transportation policy	5	235	744	54
survey	1	232	797	60
electric automobiles	1	220	648	56
greenhouse gas	3	219	639	47
travel behavior	6	215	619	54
United States	7	214	710	60
consumer behavior	1	209	555	45
charging (batteries)	2	194	599	53
perception	1	193	545	56
secondary batteries	2	190	511	44
sustainable develop	1	186	444	47
purchasing	1	180	468	42
transportation infrastructure	2	178	455	37

Source: Author compilation by VOSviewer (2024).

As shown in **Table 7**, "consumption behavior" is a central term in the network, suggesting a strong focus on consumption behavior within the research area. "purchasing" appears less frequently than "consumption behavior" but still holds a notable presence in the network. Keywords like "purchasing" and "purchase intention" are present but to a lesser extent, suggesting that the research examines broader consumer behavior patterns that might influence these purchasing decisions of EVs.

Figure 10 illustrates the relative term frequency for various research topics from 2013 to 2023, highlighting the evolving research landscape and priorities. Topics such as "greenhouse gas emissions," "sustainable development," and "electric vehicles" gain increasing prominence, reflecting growing attention to environmental sustainability and technological innovations. Conversely, "social network" and "fuel economy" exhibit relatively stable term frequencies, suggesting they may have received less focus compared to other topics.

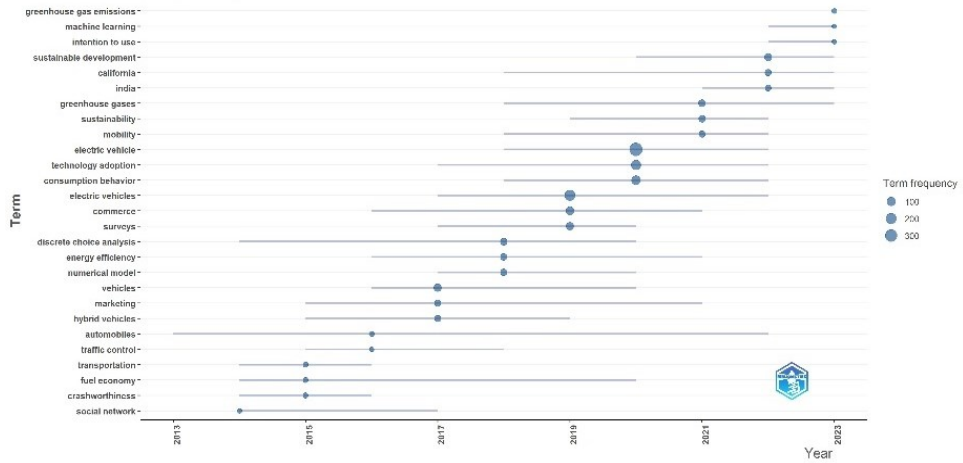


Figure 10. Trend topic (2013–2023).

(Source: Author's analysis using Biblioshiny (2024).

4.6. Thematic analysis

Thematic analysis is a valuable qualitative research method that allows researchers to uncover patterns and themes within textual data, providing rich insights into the underlying meanings and experiences captured in the data (Nowell et al., 2017; Sundler et al., 2019; Vaismoradi et al., 2013). **Figure 11** presents a thematic map of knowledge management and artificial intelligence research categorized into four quadrants (Q1–Q4): Q1 (Upper Right): Motor Themes ("electric vehicle," "electric vehicles" and "technology adoption") represent the core areas of research with a noteworthy influence on the field's development. Q2 (Upper Left): Niche Themes ("charging (batteries)," "transportation infrastructure") exhibit strong internal connections but hold limited broader impact on the field's overall progress, suggesting themes like "dataset repository," "knowledge management" and "knowledge sharing" for further exploration. Q3 (Lower Left): Emerging Themes ("bicycles," "cycle transport" and "electric bikes" encompass themes like "social media" and "social networks" that are gaining traction within the research landscape. Q4 (Lower Right): Underlying Themes ("united states," "transportation policy," and

"travel behavior") form the foundational, knowledge base, providing essential support for the field's advancement.

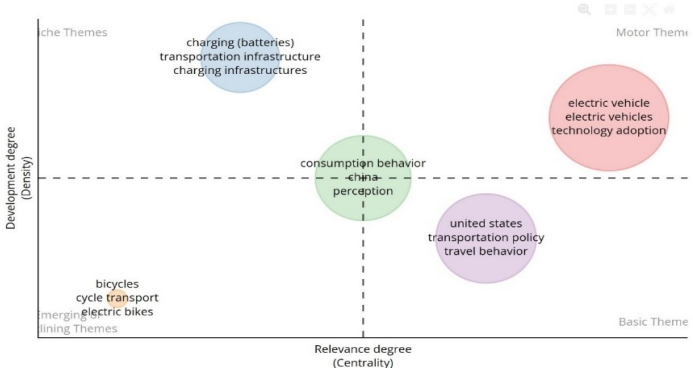


Figure 11. Thematic map.

(Source: Author's analysis using Biblioshiny (2024)).

Besides, the central positioning of themes like "consumption behavior" "China" and "perception" within the thematic map signifies a burgeoning research interest and growing scholarly efforts in this specific domain. This observation aligns with the findings presented in **Figure 12**, further highlighting the potential gap in knowledge within this emerging field.



Figure 12. Word cloud.

(Source: Author's analysis using Biblioshiny (2024)).

5. Discussion

5.1. Most influential publications, authors, and journals

The research highlights several key findings regarding the most influential publications, authors, and journals in the field of EV adoption and consumer behavior. Among the notable publications, Advances in Consumer Electric Vehicle Adoption Research: A Review and Research Agenda by Rezvani et al. (2015) stands out with 781 citations, followed by Mainstream Consumers Driving Plug-in Battery-electric and Plug-in Hybrid Electric Cars: A Qualitative Analysis of Responses and Evaluations by Graham-Rowe et al. (2012) with 486 citations, and Predicting Consumers' Intention to Adopt Hybrid Electric Vehicles: Using an Extended Version of the Theory of Planned Behaviour Model by Wang et al. (2016) with 484 citations.

The research also identifies TRANSPORTATION RESEARCH PART D: TRANSPORT AND ENVIRONMENT, SUSTAINABILITY(SWITZERLAND), and TRANSPORTATION RESEARCH PART A: POLICY AND PRACTICE as the most relevant sources with 83, 69, and 65 publications, respectively. Additionally, the analysis reveals China as the most influential country in terms of total citations (5216) and average article citations (41.40), followed by the USA and the United Kingdom. Notably, Jansson J. emerges as the most influential author with 787 links and a total citation count of 51,595, closely followed by Axsen J. with similar publication counts and a slightly lower total citation count. These findings offer valuable insights into the landscape of EV adoption and consumer behavior research, guiding future studies and informing scholarly discourse in the field.

5.2. Thematic evolution of research

In the thematic evolution of research, significant trends emerge, highlighting key areas of focus and growth. Firstly, topics related to "greenhouse gas emissions", "sustainable development", "greenhouse gases", and "sustainability" have shown a consistent and increasing emphasis over time. This indicates a robust and expanding interest in understanding the environmental impact and sustainable dimensions of transportation systems. Secondly, there is a notable rise in topics such as "machine learning", "technology adoption", and "electric vehicles", suggesting a heightened focus on technological advancements and their integration into sustainable transportation solutions. Furthermore, research areas like "consumption behavior", "discrete choice analysis", and "surveys" are witnessing an upward trend. Moreover, sustained interest in researching geographical regions like "California" and "India" underscores the relevance of contextual factors and policy frameworks in this field. Lastly, the inclusion of topics such as "numerical model", "energy efficiency", and "marketing" indicates a multidisciplinary approach, incorporating various methodologies and perspectives to study sustainable transportation systems comprehensively.

5.3. Emerging research directions

In exploring emerging research directions, researchers can explore broader demographic impacts on EV adoption and public charging infrastructure provision (Bjerkan et al., 2016). In addition to technological and infrastructural considerations, there is a need to enhance EVs' energy efficiency and address carbon emissions from different sectors (Edwards et al., 2010; Wu et al., 2015). Understanding the "attitude-action" gap is crucial for informing EV uptake studies (Coffman et al., 2016). Furthermore, investigating individual differences in symbolic attributes importance is crucial (Noppers et al., 2014), as well as understanding consumer motivations for sustainable consumption and eco-innovation adoption (Jansson et al., 2017; Rezvani et al., 2015). It is also essential to explore the psychological, technical, and interpersonal factors influencing EV purchase intentions (Mishra and Malhotra, 2019). Additionally, policy implications and regional variations are also crucial considerations (Liao et al., 2017; Zhang et al., 2022). Future research should focus

on green neighborhood formation, EV sharing dynamics, and the impact of social commerce on purchase intentions (Rezvani et al., 2015; Wang and Yan, 2016).

6. Conclusion

Research on EV purchase intentions and consumer behavior has expanded significantly in recent years, driven by a global interest in understanding these dynamics. This study enhances our understanding of the research landscape by providing a comprehensive overview of the field's development, identifying influential scholars, and pinpointing key research directions. It offers valuable insights into collaborative networks and highlights critical research areas, and depicts prevailing research themes, emerging trends and future research efforts in the crucial domain of EV purchase intentions and consumer behavior. The research also offers valuable insights for policymakers, businesses, manufacturers, and academics, guiding their decisions and strategies in the realm of EV adoption. Moreover, the research suggests avenues for further investigation, including social and cultural influences on EV adoption and the potential impacts of emerging technologies, shaping the future trajectory of the EV industry.

7. Limitations

While this research provides valuable insights into EV purchase intentions and consumer behaviors, its scope could be broadened for more comprehensive findings. Reliance on a single database might overlook relevant research, and keyword analysis may not fully capture complex or emerging concepts. Future research can address these limitations by incorporating multiple databases and more nuanced analytical methods.

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