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Psychological Ownership and Pride Among Battery Electric Vehicle Owners in Wales: An Investigation into Sustainable Transport Behaviours

By

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Abstract

Prior research has demonstrated that consumers may develop feelings of ownership and psychological attachment towards cars. However, how these come to fruition with Battery Electric Vehicles (BEVs) remains unclear despite regular interaction with technology and awareness of behaving environmentally responsible playing a key part in the ownership experience. Using the lens of Psychological Ownership (PO) this thesis aims to understand whether, and how ownership feelings towards BEVs arise, what might the consequences of these feelings be and how pride as an emotion play a role in the development and outcomes of these feelings. Focusing on BEV owners in Wales, this thesis considers feelings of PO at an individual ("mine") and collective level ("our') in the same theoretical framework, an approach that is overlooked when theorising PO. Hence, this study is among the first to assess both individual and collective PO in the same theoretical setting.

This study adopts an exploratory research design, combining both qualitative and quantitative approaches using semi-structured interviews (N=24) and surveys (N=426), with existing BEV owners. The findings offer several theoretical contributions. First, this study developed and tested a comprehensive two-way model assessing individual and collective PO together and how feelings of private and public pride act as powerful motivators in changing the strengthen of these feelings and its impact on BEV ownership and moral), bridging a gap in theoretical development. Second, the study shows how in the context of BEV ownership, appropriating technology, environmental concern, and private pride (authentic and moral) act as key strategic drivers for ownership feelings to arise. Third the study shows that key outcomes for feelings of individual and collective PO in the context of BEV ownership centre around; product self-judgment (activated product related identity), word-of-mouth, and product satisfaction. Additionally, it becomes evident the development for these outcomes is strengthened by the moderating effect of public pride (hubristic and collective). Overall, this study contributes to literature on sustainable transport and to wider literature on PO, highlighting how and under what conditions IPO and CPO co-exists and shaped using feelings of pride together using a two-way conceptual model. Additionally, it presents practical implications and recommendations to policy makers and marketing practitioners on how to encourage more consumers to own BEVs.

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Abbreviations

APRI	Activated Product Related Identity
AP	Authentic Pride
BEV	Battery Electric Vehicle
CFA	Confirmatory Factor Analysis
CP	Collective Pride
CTA	Consumer Technology Appropriation
CPO	Collective Psychological Ownership
EC	Environmental Concern
EV	Electric Vehicle
EFA	Exploratory Factor Analysis
HEV	Hybrid Electric Vehicle
HP	Hubristic Pride
ICE	Internal Combustion Engine
KMO	Kaiser-Meyer-Oklin
IPO	Individual Psychological Ownership
MLFA	Maximum Likelihood Factor Analysis
MP	Moral Pride
PCA	Principle Component Analysis
PHEV	Plug-in Hybrid Electric Vehicle
PO	Psychological Ownership
PS	Product Satisfaction
WOM	Word-of-Mouth

CHAPTER 1

INTRODUCTION

"I really do encourage other manufacturers to bring electric cars to market. It's a good thing, and they need to bring it to market and keep iterating and improving to make better and better electric cars, and that's what going to result in humanity achieving a sustainable transport future. I wish it was growing faster than it is".

(Elon Musk Tesla CEO, 2013)

Background to the Study

The last decade has seen a triad of debates take place between policymakers, industry stakeholders and consumers on how to tackle the astronomical levels of global greenhouse emissions by cause of fossil fuel combustion (United Nations 2021; Secinaro et al. 2022). With the estimation that 80% of anthropogenic greenhouse gases, such as carbon dioxide (CO_2), stem from combusting fossil fuels, policymakers and scholars are urging for a change in the way we approach our consumption choices (Jansson et al. 2017). Further anchored by the United Nations (2015) 17 sustainable development goals (SDG's) relating to health, energy, and wellbeing of cities and people, consumers are increasingly aware for the need to consume sustainably (Lubowiecki-Vikuk et al. 2021; Dangelico et al. 2022). For instance, sustainable consumption behaviours such as recycling (Catlin and Wang 2013), consuming organic food alternatives (Thøgersen et al. 2015); household energy saving (Nie et al. 2019) and sustainable sourcing (White et al. 2019) reflect some of sustainable lifestyle changes embraced by consumers.

Although an abundance of knowledge concerning sustainable consumption behaviour has emerged, one area that scholars are promoting for further research, is understanding these behaviours towards sustainable transport (Curtis 2020; Qian et al. 2023). Sustainable transport refers to the capacity to support mobility needs of society by using a combination

of zero-carbon emission modes of transportation including electric and alternative fuels, to address environmental concerns and create a carbon free transport system (Zhao et al. 2020; Godil et al. 2021). While the use of electric; buses, trams, bikes, and scooters illustrate some of the sustainable transport modes adopted by consumers, most scholars in the field agree that ownership of Electric Vehicles (EVs) in particular, Battery Electric Vehicles (BEVs) is the most promising solution to achieve sustainable transport goals (Berkeley et al. 2018; Herrenkind et al. 2019; Eftestøl-Wilhelmsson et al. 2019; Graham 2021). These 100% battery powered cars, aim to solve the issues of reliance on traditional fuels whilst solving growing carbon emission concerns (Adnan et al. 2017; Contestabile et al. 2020). Much of this conviction is affirmed by acknowledging internal combustion engine cars (ICEs) produce the highest levels of carbon dioxide (CO_2) gas from any other road transport mode emitting over 2.2 billion metric tons annually (International Energy Agency 2020). Hence, the need for consumers to own and drive BEVs as to reduce carbon emissions by as much as 40% has certainly captured global attention, including Wales (McCollum et al. 2018; Welsh Government 2019). Further echoed by recent government policies to ban the sale of new; ICE, Hybrids and Plug-in Hybrid vehicles in Wales and wider UK by 2030, BEVs are indeed recognised as the prime solution in tackling environmental challenges (Pickard and Campbell 2020; UK Government 2021; Welsh Government 2021).

However, despite strategies designed to achieve widespread ownership of BEVs, the decision to own or in some cases accept BEVs among consumers are inconsonance with targeted levels of ownership, prompting consumer behaviour scholars to investigate and uncover possible causes (Coffman et al. 2017; Biresselioglu et al. 2018; Secinaro et al. 2022; Brescia et al. 2023). Interestingly, factors such as; environmental benefits, enhanced driving performance, innovative charging capabilities, and low maintenance costs, have been understood to be the key drivers towards ownership (Egbue and Long 2012; Halbey et al. 2018; Haustein and Jensen 2018; Higueras-Castillo et al. 2020; Singh et al. 2020). While factors such as high purchase cost, safety and access to charging have been shown as perceived barriers to BEV ownership (Axsen et al. 2017; Hardman et al. 2017; Rezvani et al. 2017; Krishna 2021; Tarei et al. 2021). More recently, owners have expressed concerns regarding where the energy to power their BEV is sourced from. Skeete et al. (2020) and

Gonzalez-Salazar et al. (2023) argue, the energy source plays a key role for consumers decision making in determining their overall environmental impact. Indeed, these zero tailpipe emissions vehicles suggests these are powered by 'clean energy'. However, the sustainability image of their lifecycle hinges on the carbon footprint generated when producing electricity. For instance, Liu et al. (2023) has indicated consumer are more inclined to own a BEV provided that charging manufacturers focus on delivering clean, green electricity power, even it means paying a premium to use this.

Adding to this, growing concerns have been expressed by consumers particularly that of early adopters on the battery disposal processes when the BEV reaches the end of its lifecycle (Adu-Gyamfi et al. 2022). Building on the rapid rise in BEV interest and the predicted demand for BEV ownership in the coming years, the post-vehicle battery issues surrounding its re-purposing and safe disposal is being challenged considerably (Beaudet et al. 2020; Afreen et al. 2021). Undeniably, the intensive mining processes used to extract the lithium to produce BEV batteries have certainly sparked debates among existing and future owners on the damaging impact caused by BEV production, its sustainability practices and recycling initiatives (Abdelbaky et al. 2020). Researchers have therefore questioned the true green image of BEV's giving the ecological implications that surrounds its life cycle particularly its resource mining, hazardous material waste and irreparable battery cell technology (Fotouhi et al. 2016; Skeete et al. 2020). However, with the second-hand buyers market yet to mature, recycling and disposal of BEV batteries has been somewhat overshadowed by consumers growing interest in driving electric. Overall, it is evident these environmental impact and sustainability practises debates play a key role in ownership intention.

That aside, one research area scholars believe deserves further inquiry, is the relationship between the self and ownership of BEVs (Whitmarsh and O'Neill 2010; Bardhi et al. 2012; Barbarossa et al. 2017). Research in this area is relevant as for the most part, owning a car irrespective of whether it is full legal, lease or access based is widely recognised as a possession of high value, (monetary or figuratively) with consumers often place feelings of psychological attachment towards them, thus forming a bridge between the self and the car

(Dittmar 1992; Steg 2005; Ruvio and Belk 2013; Ye and Gawronski 2016). Furthermore, it is well understood in academic literature that consumers seek material goods to define themselves, and symbolise the uniqueness from others, which ultimately leads to developing strong feelings of attachment towards possessions (Belk 2018). Hence for some consumers, the decision to own a car can be influenced by socioeconomic status, personality, preference and even self-identity (Algesheimer et al. 2005; Blumenberg et al. 2011; Barbarossa et al. 2017).

Proponents of this view in the field of sustainable transport have presented knowledge and established connections between the self and consumers decision to own a BEV. The findings show those who assume a pro-environment or tech-savvy self-identity are more inclined to own an BEV, as this fits with their self-image (Schuitema et al. 2013; Asadi et al. 2020; Singh et al. 2020). However, these studies and others examining consumer behaviour towards BEV ownership focus on potential consumers who are yet to own thus fixating their conclusions on intention to own. One drawback of this approach, is that intention behaviour does not always result in actual behaviour (Davies and Foxall 2002; Foxall 2007; Hassan et al. 2016). Davies and Foxall (2002) demonstrated this by showing how despite consumers responding 'yes' when questioned about whether they recycle their waste, most consumers ignore this action given the time and effort needed to perform it. Therefore, to examine consumer behaviour in a manner that avoids speculating whether consumers may act differently, this research explores consumers who already own a BEV, an approach that is largely overlooked in the field of sustainable transport. Approaching the study from this perspective allows for a more focused inquiry into the subject of BEV ownership, and avoids the constraints seen when observing consumers expected or intention behaviour. This allows the study to present knowledge into how to better understand consumers' expectations and willingness to own a BEV by presenting key information drawn from existing BEV owners.

Against this backdrop, consumer behaviour scholars have presented arguments on how and why feelings of attachment arise towards possessions (including cars) in a post ownership setting (Belk 1988; Peck and Shu 2018; Yap and Grisham 2019). However, scholars are yet to

capture the potential differences that may exist when owning a BEV, despite acknowledging that technology interaction and sensitivity to environmental issues bridge the relationship between the owner (i.e., the self) and the BEV (Curtis 2020; Graham 2021).

Nevertheless, one of the main theoretical lenses used to observe feelings of ownership, is the theory of Psychological Ownership (PO) pioneered by Jon Pierce and colleagues (Pierce et al. 2001; Pierce et al. 2003; Van Dyne and Pierce 2004). PO is defined as '*the state in which individuals feel as though the target of ownership or a piece of that target is "MINE"*' (Pierce et al. 2003, p.86). Hence, PO theory aims to explain why feelings of attachment and ownership arise. To add to this, PO theory also argues that feelings of ownership go beyond just feeling legal right but also include feelings of proprietorship through knowledge gain, self investment and gaining control (Pierce et al 2003; Pierce and Jussilia 2011, Peck and Shu 2018). While majority of the literature referencing PO assumes that feelings of ownership emerge at an individual level i.e. IPO, several scholars propose feelings of PO may manifest at a collective level also (Pierce and Jussila 2011; Dawkins et al. 2017; Nijs et al. 2021). Consequently, Collective Psychological Ownership (CPO) describes how group members may develop feelings towards a target, object or possession such that is becomes "*OURS*" (Pierce and Jussila 2011).

Although CPO has received growing attention, it remains unclear whether feelings of individual and collective PO can coexist among consumers towards the same target or possession, prompting scholars to call for further research (Morewedge et al. 2021; Peck and Luangrath 2022). Consistent with this growing body of PO literature, one of the aims of this thesis is to expand the discourses on PO theory and investigate this theoretical gap between IPO and CPO using the context of BEVs ownership and offer clarity in this domain.

Unlike ICE's, the focal point of BEVs assumes consumers hold some knowledge about its environmental benefits and understanding of how to control and use its technology which together play a defining role during ownership (Bangsa and Schlegelmilch 2020; Bobeth and Kastner 2020). Thus, the next step to further our understanding is to explore and understand how knowledge gain and achieving a sense of control might instigate feelings of IPO and CPO in BEVs and indeed other sustainable transport modes. Existing literature suggests that feelings of IPO towards a target has the potential to manifest through gaining

knowledge about how the target benefits the natural environment (Süssenbach and Kamleitner 2018). On a collective note, some scholars have postulated how feelings of CPO towards a group may develop if group members share collective feelings of responsibility and obligation to care for the natural environment (Peck et al. 2021; She et al. 2022). However, with a lack empirical evidence to support these convictions, further investigation is necessary. Exploring the relationship between the natural environment and PO is fruitful for at least two reasons. First, PO has been shown to mostly stimulate positive effects for the target object. For instance, feelings of ownership positively affect individuals' attitudes towards the environment through increased stewardship behaviours (Shu and Peck 2018; Nijs et al. 2022). Second, Kamleitner and Rabinovich (2010) suggest that perceived responsibility and desire to care for a target draws the self closer to it provoking feelings of attachment. Consequently, since BEVs to some degree indicate caring for the natural environment (Schuitema et al. 2013; Asadi et al. 2020) investigating this notion on an individual and collective level will further our understanding of PO theory in sustainable transport consumption behaviours.

To add to this, BEVs encompass innovative and forward-looking technologies such as 'plug-in to charge', where owners are regularly exposed to technology interaction as part of BEV ownership (Müller 2019). There exist mixed conclusions on whether interacting with technology strengthens or weakens feelings of PO towards a possession. The former argued conceptually by Gaskin (2012) and Kirk et al. (2015) suggests that as feelings of control over technology increase, feelings of PO should emerge also because of the desire to be in control reflecting one of the main motives for PO (Pierce et al. 2003). The latter argued by other scholars, suggests if this technology is automated this restricts the consumer from attaining control due to a lack of physical interaction, hence impeding feelings of PO to develop (Longoni and Cian 2022; Smith et al. 2022). In the case of BEVs where these cars are increasingly integrating autonomous features such as self-parking and self-driving in addition to involving interactive technologies such as 'plug-in' to charge, how technology interaction shapes feelings of PO deserve further investigation. These propositions therefore provide ample evidence to investigate and uncover the role sense of control plays

in driving and fulfilling feelings of IPO and CPO as part of BEV ownership.

Extending these enquiries, consumer behaviour scholars have also considered the consequences of having feelings of IPO and CPO revealing a range of behavioural and attitudinal responses such as; or activating or strengthening an identity (Weiss and Johar 2018; Zhang et al. 2023), engaging in word-of-mouth communication (Peck and Shu 2009; Fuchs et al. 2010) and increased product valuation (Sinclair and Tinson 2017; Li and Atkinson 2020). However, understanding how these or other potential outcomes arise from IPO and CPO individually or together, in relation to owning a BEV is yet to be captured. Hence, by identifying these, this will not only expand our scope on PO theory, but also provide insightful information that can be used by policymakers and industry stakeholders to promote and encourage consumers to own a BEV.

Finally, to further offer an original contribution to literature and expand our understanding of PO theory, the significance and role of emotions are considered. Despite PO theory arguing that attachment feelings towards a possession plays a significant role in developing ownership feelings, the theory lacks clarity on the specific emotive feelings that emerge and how this affects ownership feelings. By reflecting on emotions that correspond to the self, that is self-conscious emotions (Tracy et al. 2007; Tracy and Weidman 2021), exploring how emotion impacts the development and outcome of feelings of IPO and CPO offers a deeper psychological insight into understanding of PO theory. One of the self-conscious emotions that has caught scholars' attention when discoursing PO theory is pride. Indeed consumers often feel a sense of pride in ownership, whether it is directed towards a physical possession, a brand, or an abstract sentiment (Kaur and Verma 2023). Pride can be categorised as a positive emotion that can be *authentic* in nature (describes feelings of achievement) or *Hubristic* (describes feelings of superiority) (Tracy et al. 2007; Tracy and Weidman 2021). Nonetheless, much uncertainty still exists about how pride contributes to feelings of PO with just two studies exploring this (McFerran et al. 2014; Ahuvia et al. 2018). Although, both studies suggest pride in ownership is felt among majority of consumers, it remains unclear which facet of pride specifically, and whether this transpires as part of developing PO feelings. While these scholars offer key insights into pride in ownership, the

lack of empirical application with PO theory and indeed sustainable transport contexts, suggests a gap in knowledge with further research needed to advance our understanding. Nonetheless, there exists a sound understanding of pride in car ownership where this feeling is seen as a prevalent sentiment present among consumers, since this feeling describes the emotional bond developed towards the car from fulfilling personal aspirations (Steg 2005; Zhao 2020). Regarding BEV ownership, exploring whether feelings of pride may emerge from owners acting on their environmental sensitivity by choosing to own a BEV, or for feeling a sense of achievement for successfully using the many technological systems of the car, remains unclear, creating opportunity to explore this in the study. Hence, understanding the role feelings of pride have as a mechanism in manifesting and developing feelings of IPO and CPO is the next step to furthering our understanding of PO theory.

Overall, this study investigates feelings of ownership among BEV owners using the theoretical lens of PO. In doing so, it aims to fill a gap in knowledge by investigating consumers behaviour towards BEV from the perspective of existing owners, an approach often neglected in sustainable transport domain. Consequently, this study will address several theoretical gaps including examining whether individual and collective PO can coexist in the same setting, what are the key drivers and outcomes of IPO and CPO, and how might pride may navigate these PO feelings when owning a BEV at both individual and collective level.

1.2 Research Aim and Questions

One of the aims of this research is to investigate how feelings of PO emerge towards BEV's and the drivers that instigate these feelings. Second, this study aims to explore the key differences between individual and collective feelings of ownership in a BEV setting. Third, this study considers the consequences of these feelings and how this defines BEV ownership feelings. Finally, this study questions the role of pride in BEV ownership and more importantly how pride may enrich and impact individual and collective PO feelings. To achieve this, this study empirically examines existing BEV owners in Wales due to the low levels of BEV ownership as compared with the other UK nations.

Further justification about choosing Wales for the context is presented after offering the research questions:

1. What are the drivers that contribute to the development of PO at individual and collective level?

2. What are the consequences of feelings of individual and collective PO and how do these differ in BEV ownership?

3. How might different feelings of pride impact the development and consequences of both individual and collective feelings of ownership in the context of BEV ownership?

1.3 Research Context - Wales

This study focuses on Wales, one of the four countries in the United Kingdom (UK). Aside from the UK government advocating for increased levels of BEV ownership, the Welsh Government has independently expressed commitment to achieving an ultra-low sustainable transport system, with BEVs playing a key role (Welsh Government 2021). Coordinating alongside the UK government, the Welsh Government supports the ban on the sale of new ICEs and PHEV by 2030 placing a greater emphasis on the urgency to deliver targeted BEV ownership rates. Moreover, with a proposed investment of £74 million placed in 2021 strengthened with a further £15 million investment in June 2023, plans are underway to achieve a zero-carbon sustainable transport lead by increasing BEV ownership (Welsh Government 2023c). These commitments represent the foundation of the 'Sustainable Transport Hierarchy' plan designed to promote and increase; active travel, cleaner public transport and BEVs ownership by 2030. Table 1.1 presents the total number of BEVs registered in Q2 2023 by each UK nation to illustrate current ownership levels:

Table 1 Total Number of ICEs and BEVs Registered in Each UK Nation – Q2 2023					
Country	Population (millions) as of 2023[1]	Total Number of Cars (millions)	Percentage (%) of car owner by population	Total number of BEVs registered as of 2023[2]	Percentage of BEVs / Country (%)
England	56.54	27.33	48.33	686,553	2.14%
Scotland	5.48	2.54	46.35	47,589	2.06%
Wales	**3.11**	**1.59**	**51.13**	**16,091**	**1.1%**
N. Ireland	1.95	1.02	51.79	9,866	0.97%
United Kingdom (total)	67.02	32.48	48.46	759,879	2.34%
Source: Office of National Statistics [2] Source: Society of Motor Manufacturers and Traders for Q2 of 2023					

The data shows that only 2.34% of all UK cars as of Q2 of 2023 are BEVs, signalling low levels of ownership with potential barriers for this cause. Specifically in Wales, the data show a higher percentage of car owners per population (51.13%) than England and Scotland (48.33%) and (46.35%) respectively, but a lower percentage of these being BEVs (1.1%) than England and Scotland (2.14%) and (2.06%), respectively (Department for Transport 2023; SMMT 2023). Hence the data signals how the penetration of BEV's into the market of Wales is faced with consumer centred barriers, raising questions about why this might be the case.

Beyond considering the ownership rates, road traffic levels in Wales have rebounded by approximately 80% following the COVID-19 pandemic despite working from home becoming a desired option, with 78% of all road traffic in Wales still being produced from cars (Department for Transport 2022; Welsh Government 2022). Interestingly, during the COVID-19 lockdown period, the levels of CO_2, Nitrous Oxide (NOx) and Nitrogen Dioxide (NO_2) in Wales dropped on average 52%, 49% and 36% , respectively compared to pre-COVID periods (Welsh Government 2021). This offered a brief insight into the atmospheric and public health benefits that could arise if majority of cars in Wales did not emit harmful toxins from using ICEs.

Beyond this, when recognising Wales has more public EV chargers (1725) than conventional petrol/diesel fuel stations (920) (ZapMap 2023), it further raises questions on the low ownership rates, reinforcing the need to understand consumer behaviour towards BEVs in Wales. Finally, while scholarly researchers have presented findings about consumers' behaviour towards EVs and indeed BEVs focusing on select regions in the UK namely; Scotland (Beeton et al. 2016), Northern Ireland (Morrissey et al. 2016) and England (Berkeley et al. 2018), no scholarly research has been conducted using Wales as the focus point to understand consumers reaction to BEVs. Thus, given the lack of empirical research, this study provides a unique opportunity to explore consumers' behaviour towards BEVs and bridge a contextual gap in the literature. Therefore, this research and the participants used in the study will be concerned those living in Wales.

1.4 Research Methodology

The majority of the studies applying PO theory utilise quantitative methods such as surveys and experiments (Peck and Shu 2009; Fuchs et al. 2010; Paundra et al. 2017; Weiss and Johar 2018). However, given the lack of empirical research on PO theory and sustainable transport particularly in the context of BEV ownership, this study adopted an exploratory research design with a two-phase data collection process. First, a qualitative investigation was employed to explore and understand PO in the context of BEV ownership and expand on the knowledge revealed from the literature. A total of 24 BEV owners in Wales were interviewed online lasting 55 - 75 minutes each, and transcribed verbatim. After synthesising the data thematically using NVivo v13 and presenting the findings, a series of hypothesise were proposed as well as a conceptual framework (chapter 4.6) to guide the second phase of the study. This phase of the study involved testing the hypothesis using a self-administrated online questionnaire again aimed at BEV owners in Wales.
Prior to collecting the main survey responses for the study (N= 426), a pilot study was conducted (N= 101) to purify the scale used and to identify the underlying relationships between the measured variables using exploratory factor analysis. As for the results from the main survey, confirmatory factor analysis using AMOS 27 software was first conducted to measure the relationship between observed variables and their underlying constructs,

prior to testing the proposed hypothesis. The main survey data and subsequently the hypothesis were tested using a range of statistical techniques involving; descriptive analysis, hierarchal regressions, and path analysis all using SPSS v29 and PROCESS macro by Hayes v4.2. The research methods employed are discussed in greater detail in Chapter 3.

1.5 Structure of the Thesis

Chapter one introduces the research context and background and provides justification for the research. It also presents the research; aims, questions, methodology and contributions of this study. Chapter two discusses prior literature work on; the field of sustainable transport and BEV ownership, the theory of PO including its principles and how it has been adopted in consumer behaviour studies thus far, and the role PO may play in understanding BEV ownership feelings. In addition, this chapter reviews the literature on feelings of pride and the significance this has on advancing PO theory. Chapter three proceeds by outlining and justifying the philosophical approach of the study (pragmatism) before presenting the research method; design, and analysis techniques to be used. Furthermore, acknowledgement of the ethical considerations of the study is outlined. Chapter four discusses the interview findings from this study presenting the three themes that were developed from the data concerning the individual and collective feelings of ownership in the context of BEV ownership. Chapter five presents the procedures used to purify the survey to enhance scale reliability by conducting exploratory factor analysis on the pilot study. Chapter six discusses in detail the findings of the refined survey that was self-administered to collect responses from BEV owners in Wales using a range of statistical analyses including; confirmatory factor analysis, hierarchical regression, and path analysis to test the proposed hypothesis. Finally, Chapter seven discusses the study's outcomes by bringing together the findings from the qualitative and quantitative phases and offering empirical and theoretical findings, in addition to recommendations for future researchers. Figure 1 presents the structure of the thesis.

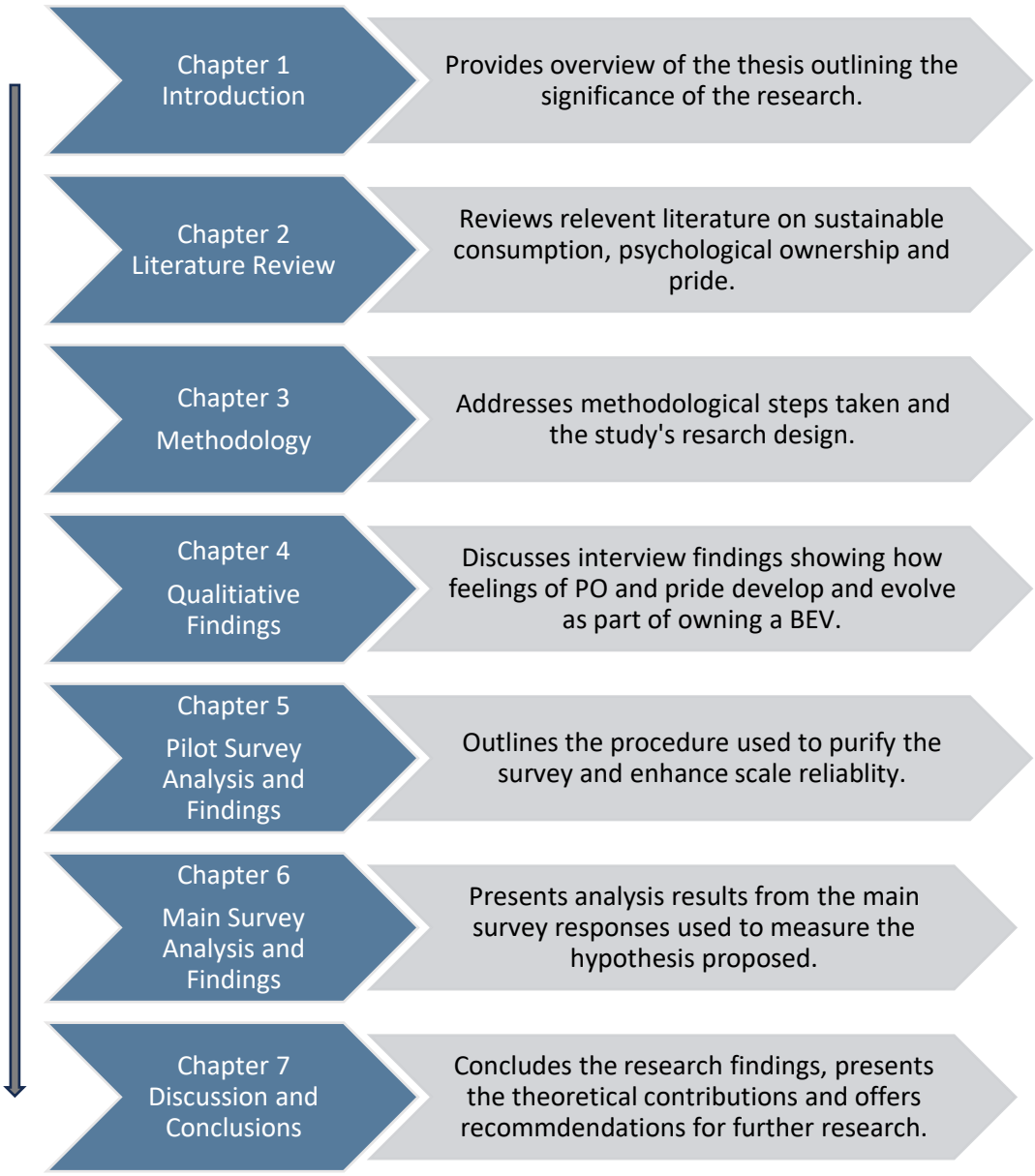


Figure 1 Structure of the Thesis

1.6 Chapter Summary

This introductory chapter presents an overview of the thesis. First, a background covering the main arguments why BEVs are the focal point of the study is presented. Following this. chapter 1.2 outlines the study's aims and research questions before presenting the research context for this study – Wales in Chapter 1.3. Finally, chapters 1.4 and 1.5 present the

research methodology employed in this study and an overview of the structure of the thesis. The preceding chapter (Chapter 2- Literature Review) reviews and discusses the main arguments in the literature concerning PO theory and argues that its motives, routes, and outcomes in the context of BEV ownership remain unclear.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical origins and debates concerning the self and ownership to frame the relevant literature to be reviewed. Prior to this, a brief discussion concerning the field of sustainable transport and BEV ownership is offered arguing, research concerning the self and BEV ownership requires further work. Accordingly, the relationship between the self and car ownership is then drawn upon before discussing the theories used to observe ownership feelings. Finally, justification for selecting the theory of Psychological Ownership (PO) as the main theoretical lens of the study is offered and the principles of this theory including the motives and routes are also reviewed before discussing the potential outcomes of feelings PO. As the literature discussion unfolds, it becomes evident that feelings of ownership not only take place on an individual level, but also at a collective level. However, it is unclear whether these can co-exist in the same setting, and if so, how, indicating a research gap in PO theory. Furthermore, it was understood that despite emotional attachment being seen as a central feature of PO, it remains unclear how and which emotion plays an active role in developing these feelings. The review argues this theoretical gap may be answered by investigating how feelings of pride shape the development and outcomes of individual and collective PO. Finally, the review concludes by presenting the study's research questions which will be used to examine feelings of PO among BEV owners.

2.2 Sustainable Transport

Application of sustainable principles in transport has gained significant scholarly attention as an action call to meet sustainable development goals and principles (Budd and Ison 2020). In that regard, the field of sustainable transport aims to better understand how sustainability is integrated in transport from both a policy and consumer perspective to create carbon-free

emitting transport systems (Qian et al. 2023). Most of the research conducted in this field has focused on exploring the benefits that sustainable transport brings to consumer lifestyles (Schönduwe 2015; Venter et al. 2018; Eccarius and Lu 2020; Awad-Núñez et al. 2021). In other words, understanding how to satisfy consumer needs to stay connected with societies and communities through transport but, achieve this in a fashion that addresses global environmental challenges (United Nations 2015; Curtis 2020). With this in mind, scholars hold the belief that sustainable transport shares both a narrow and broad definition (Zhao et al. 2020). The former emphasise on the environmental issues and resource depletion, while the latter denotes a broad range of factors that benefit from sustainable transport, including social, economic and health impacts (Offer et al. 2010; Haghshenas and Vaziri 2012). Nonetheless, given the growing body of literature that recognises the need to understand how to encourage consumers to engage with sustainable solutions in transport, suggesting the latter is preferred (Rietveld and Stough 2005; Van Nunen et al. 2011; Krause et al. 2016; Zhao et al. 2020).

Findings by Herrenkind et al. (2019) and Eftestøl-Wilhelmsson et al. (2019) revealed that consumers' attitudes toward using public sustainable transport i.e. electric buses and trams, are driven by concerns to reduce emissions levels caused by severe traffic congestion in their area. While other studies adopted a different approach in understanding consumers behaviour by questioning how to increase acceptance and usage intention of sustainable transport in urban environments (Simsekoglu and Klöckner 2019; Eccarius and Lu 2020; Mola et al. 2020). The conclusions drawn show that consumers' willingness to use sustainable transport in urban areas increased in the presence of on demand, easy access, and convenient transport choices through 'mobility as a service' or MaaS. This access-based concept, fixed on digital channels and platforms offers consumers sustainable travel using e-bikes and e-scooters on a short-term basis, removing the need to privately own such mobilities (Mola et al. 2020). Aside from questioning consumers behaviour, the field has also questioned how best to tackle environmental and sustainability challenges faced among businesses' transportation and logistics services (Centobelli et al. 2017; Froio and Bezerra 2021; Naumov et al. 2023). Recent findings by You (2022) show how businesses can achieve less carbon intensive intermodal transport, by relying on routing algorithms to map out energy-efficient delivery routes. This integration of utilising digital technology to deliver

sustainable transports solutions echoes Froio and Bezerra (2021) beliefs that technology reliance is perhaps just as important as environmental concerns when achieving sustainable transport goals. Overall it can be said, the knowledge attained across the field has been instrumental in advancing the understanding of transport sustainability.

While scholars in the field have presented key information on how to achieve and transition towards a sustainable transport society, most scholars argue further work is needed in understanding consumers behaviour towards BEV ownership (Huang and Ge 2019; Qian et al. 2023). The reason for this is how policymakers and scholars acknowledge that ICEs cars are responsible for the majority of anthropogenic greenhouse gases caused by road transport and hence shifting towards BEVs would address the environmental drawbacks of ICE's (Suh et al. 2017; Berkeley et al. 2018; Haustein and Jensen 2018; Graham 2021). Subsequently, the following section reviews the current knowledge covering BEV ownership in the field of sustainable transport and its knowledge gaps.

2.2.1 BEV Ownership in Sustainable Transport

The last decade has seen an abundance of research emerge on BEV ownership from multiple disciplines such as engineering, environmental geography, and behavioural science, questioning the innovation, eco-consciousness and utilitarian benefits of BEVs. Scholars in engineering for instance, have shown that improvements in BEV battery performance may be achieved without compensating on power efficiency, safety and car performance (Fotouhi et al. 2016; Duraisamy and Kaliyaperumal 2020). While environmental science and geography scholars present debates on the public health benefits of driving BEVs particularly on air quality and carbon levels (Teixeira and Sodré 2016; Moro and Lonza 2018; Gryparis et al. 2020).

However, it is the research emerging from consumers behaviour scholars that accelerated our understanding on consumers' decision making towards BEV ownership. That is to say, the findings from this discipline have advanced our understanding of consumers attitude, beliefs and perception and BEV ownership. Subsequently, factors such as enhanced driving performance, safety, and environmental benefits have been identified as driving factors for

consumers to own a BEV (Rezvani et al. 2015; Coffman et al. 2017; Haustein and Jensen 2018; Asadi et al. 2020). At the same time it has been understood that high purchase cost, battery range limitations, and charging infrastructure doubts are key barriers to ownership (Axsen et al. 2017; Hardman et al. 2017; Higueras-Castillo et al. 2020; Krishna 2021).
The literature therefore has explored how various socio-technical can stimulate ownership decisions.

Surprisingly however, the relationship between the self and car ownership has not been closely examined in BEVs despite scholars acknowledging consumers tend to define themselves through what they own, including their cars (Dittmar 1992; Steg 2005; Appiah 2020). To add to this, other scholars hold a common view that consumers perceive cars as a material possession and consequently develop feelings of attachment and ownership towards forging strong emotional connections (Dittmar 1992; Steg 2005; Ruvio and Belk 2013). This view is welcomed by Gatersleben (2011) and Ranyard (2017), who also recognise that the reason cars are perceived by consumers as a personal possession, is because they illustrate the owners' experiences, feelings, and memories with it. Hence, it explains why car ownership goes beyond offering simple utility functions, but further acts as a tool to aid constructing our individuality and how we view the self (Ye and Gawronski 2016; Peck and Luangrath 2022). Nonetheless, there is a lack of empirical evidence to determine the causal relationship between the self, BEV, and the car as a possession. However, what has been documented in the literature on the self and BEV ownership is scarce, with limited findings offered by Barbarossa et al. (2017) and Bobeth and Kastner (2020) who postulate that indeed the self holds significant value when owning a BEV. Barbarossa et al. (2017) indicated consumers green self-identity can lead to BEV ownership by channelling their ecological and moral obligation motivations. While Bobeth and Kastner (2020) imply that moral and social motives are perhaps more important than rational motives such as a purchase cost when deciding to own a BEV. More recently, findings by Brescia et al. (2023) suggests, BEV are perceived by consumers as status symbols and a fashion statement to demonstrate environmental responsibility, encouraging others to own a BEV irrespective of the purchase cost.

Aside from the key knowledge gained from these studies, one drawback to these studies and others covering BEV ownership, is how much of the discourse and its findings are

directed towards intention behaviour, which has been criticised by consumer behaviour scholars to not reflect actual behaviour (Davies and Foxall 2002; Hassan et al. 2016). Consequently, since scholars have shared consistent opinions on the self and car ownership arguing, that consumers often form psychological connections with their car through memories and experiences, drawing the self closer to it, examining how this unfolds among existing BEV owners is more logical (Whitmarsh and O'Neill 2010; Ye and Gawronski 2016; Purwanto and Prima Rini 2022). With that being said, the following section discusses prior knowledge of the self and car ownership as a possession, as this will aid in framing the relevant literature to draw upon when discussing ownership feelings towards BEVs.

2.3 The Self and Car Ownership

Most studies in the field of consumer behaviour tend to adopt Grubb and Grathwohl (1967 p. 23) definition of the self that describes the self as "What one is aware of, one's attitudes, feelings, perceptions, and evaluations of oneself as an object". Having said this, it seems the term 'the self' is often presented differently in literature under the term 'self-concept' suggesting these terms are used interchangeably (see; Adler et al. 1983; Callero 2003; Strohminger et al. 2017; Sharma et al. 2020). Despite the variation in terms used, scholars agree that individuals are eager to own possessions and objects to satisfy the self and further to symbolise their identity (Kopytoff 1986; Belk 1988; Ahuvia 2005; Watkins 2015; Chung and Johar 2018; Brenner et al. 2021).

Research concerning ownership and the self has been debated and approached by researchers predominantly from two perspectives. The first put forward by anthropologist, Igor Kropytoff (1986) who believes objects and materials mirror a commodity used to draft or guide social interactions hence creating their own 'biographies'. In contrast, Russell Belk's proposed a different perspective in his seminal paper "Possessions and the Extended Self" (Belk, 1988). Instead of suggesting ownership of possessions is separate and distinct from commodities, Belk argues individuals generate proprietary feelings for possessions, which is why we tend to view them as "things we call our own" (Belk, 1988 p.146). Belk's reasoning for this is how he believes possessions have both a symbolic and functional purpose. For instance, in car ownership, the functional aspect may relate to the utilitarian benefits to the

owner (e.g., using the car to get to work). At the same time, the car can also symbolise the individual's personality and social affiliation (e.g., owner of an off-road SUV to symbolise being an outdoor enthusiast). Thus, to some degree, consumers seek car ownership to fulfil various roles in their lives. Building on this understanding, Dittmar (1992) work in '*The Social Psychology of Material Possessions'* has guided scholars for decades in understanding functional, symbolic roles and affective roles of material possessions. Supporting the work of Belk's (1988), Dittmar (1992) argues ownership of possessions help individuals to not only acquire, but also fulfil an identity as possessions can epitomise the self by answering "Who am I?" (Porteous 1976), "Who was I?" (Cram and Paton 1993), and "Who will I become?".

Regarding to car ownership, asserting personal meanings and attachment towards them is believed to be a common practice among consumers, as cars are highly valued either monetarily or figuratively (Dittmar 1992; Steg 2005). Hence, cars are perceived as extensions of their owner as they can illustrate their socioeconomic status, personality, and preferences (Algesheimer et al. 2005; Blumenberg et al. 2011; Belk 2014). This explains why car ownership is often described and talked about in conjunction with status, particularly for owners who feel a sense of empowerment and independence. Conclusions drawn by Collin-Lange (2014, p.414) suggest, the emotional bond towards a car is instigated following a self-evaluation on status and personality: "the time I got my first car, I just felt I had grown up like 20 years. I felt so mature". Similar conclusions drawn by Gatersleben (2011) further indicate that individuals indeed hold emotional connections with cars as 51% of the study's respondents indicated out of ten possible choices, their car was the most important possession in their lifestyle. In this regard, car ownership can signal how the self forges a bond with the car by showing where ''not me'' end and ''me'' begins:

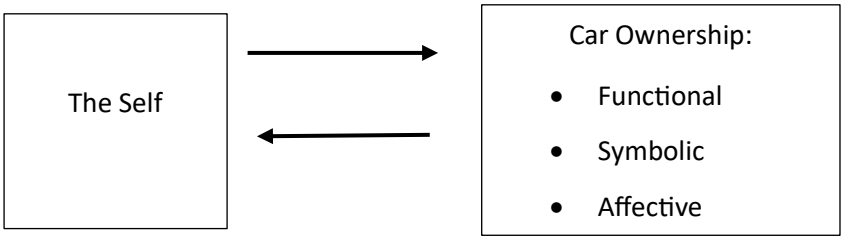


Figure 2 The Self and Car Ownership

2.3.1 Defining Ownership

Whilst some consumer behaviour scholars draw parallels with Belk's work, others seem to use the terms "possession" and "ownership" interchangeably making the distinction between them unclear. For instance Bardhi et al. (2012) proposes "ownership expresses the special relationship between a person and an object calling 'owning,' and the object is called 'personal property' or a 'possession.'". Similarly, Stern and Lewinsohn-Zamir (2020) suggest that ownership typically consists of several rights; the right to use, manage and excuse others from, and the right to liberally control the asset. These notions indicate there is an argument to be made that possession and ownership can be treated as equal. However, this becomes problematic when considering ownership and attempts to clarify the differences between the legal and social rights regarding the use of the material. Belk (2014 p.34) offers a thought to help create a distinction between the two:

"From a legal and economic point of view, when we own something, it is our property, and we have certain rights and responsibilities regarding it. These include the rights to use, sell, give, or otherwise dispose of the property as well as the right to exclude others from doing so and to receive the fruits or benefits that the property may produce."

Consistent with this line of reasoning, ownership should be regarded as a right over a material to be used exclusively and unrestrictedly with some degree of proprietary feelings towards it. However, within the last decade, there has been are rise in discourses on access-based consumption reflecting a 'post-ownership economy' driven by shifts in consumption options and habits (Baumeister and v. Wangenheim 2014; Bardhi and Eckhardt 2017; Fritze et al. 2020). Hence, when owning a material, the right to ownership does not necessarily need to be present as "transactions may be market mediated in which no transfer of ownership takes place" (Bardhi et al 2012, p.1). Subsequently, while legal ownership of materials is bounded by a legal transfer of ownership between the buyer and seller, access-based consumption introduces a new dynamic to ownership behaviour as it depends upon 'access to' rather than 'ownership of' materials (Eckhardt et al. 2019). Therefore, this contradicts the traditional views shared by consumer behaviour scholars in that user–item relationships takes place with full legal ownership (Peck and Luangrath 2022).

In reference to this study, recognising ownership of a BEV can take several forms, including outright full purchase, long-term lease, rent or even car share makes understanding the psychological mechanisms of ownership challenging. Whilst these different types of ownership have long existed in cars, because of the outright purchase cost of BEVs being considerable higher than its ICEs equivalent (Meisel and Merfeld 2018; Münzel et al. 2019), there has been a rise in access based consumption with respect to EVs e.g services such as 'Zipcar' and 'Enterprise Car Share'. Accordingly, Bardhi et al. (2012) and Paundra et al. (2017) suggest access-based consumption liberated the social and property obligations that come with legal ownership and, for the most part it does seem to deteriorate the emotional bond an individual can develop towards the car. These conclusions seem to be a common theme with other materials considered by scholars who in a similar fashion conclude, although convenient, access-based models risk losing the emotional connection between the user and the material (Paundra et al. 2017; Belk 2018; Morewedge et al. 2021; Alkaffary 2022; Trujillo-Torres et al. 2023). While primitively this may signal the beginning of a shift in ownership behaviour towards cars, questions such as; what does it mean to hold ownership over a car? and what are the mechanism that strengthen the emotional bonds in car ownership? still warrant further investigation.

The following section reviews the various theories concerning ownership and justifies how the theory of PO (Peirce et al. 2001, 2003) will be used throughout this thesis as a framework to guide the research.

2.4 Theorising Feelings of Ownership

Consumer behaviour scholars have focused on four main theoretical perspectives to observe ownership feelings and its measurable effects. Attachment Theory, Egocentric Categorisation Theory, Endowment Effect and theory of PO are the main theories used to examine ownership feelings (Brasel and Gips 2014; Chung and Johar 2018; Weiss and Johar 2018; Morewedge et al. 2021; Nesij Huvaj et al. 2023). These theories can be divided between outcomes of ownership and possession attachment.

In the case of the Endowment Effect (Kahneman and Thaler 1990) and Egocentric Categorisation Theory (Tajfel and Turner 1986) these are lenses used by scholars to examine

the outcomes of ownership. The endowment effect can be used to understand why individuals may assert a stronger valuation of an owned object than would otherwise be placed for the same object owned by others. A study by Brasel and Gips (2014) revealed using touchscreen interfaces can lead to an endowment effect because of their effects on perceived product ownership. Whilst egocentric categorisation theory draws on how ownership over a material, whether physically or simply feelings of ownership shapes how the individual responds to it in relation to themselves (Weiss and Johar 2018). To put it another way, when individuals' develop feelings of ownership over a material, they mentally position and classify it in accordance with the self. However, the same material may not be classified in the same manner if they are perceived to be external to the self, that is feelings of ownership are not present (Weiss and Johar 2018).

In contrast, the other research stream considers possession attachment and the outcomes this has on the experience of ownership and its feelings. Attachment Theory (Kleine et al. 1995) and the Theory of PO (Pierce et al. 2003), observe ownership behaviour holistically whilst attempting to measure the strength and antecedents of the feelings of ownership. The foundation of these theories is anchored by Belk (1988), whose work on the extended self proposed that individuals consider tangible and intangible possessions as a part of their identity and as an extension of themselves. The 'we are what we posses' notion heralded by Belk has therefore guided scholars on theorising the relationship between, the self, possessions and feelings of ownership. Overall, it can be said each of these streams observe the 'user-item' relationship, personal meanings and emotional attachments in relation to ownership.

Returning to the focus of this study, Pierce et al. (2003) work on PO is widely praised in consumer behaviour as a theory that expands the horizons on our understanding of ownership behaviour (Peck and Shu 2018; Felix and Almaguer 2019; Morewedge et al. 2021; Peck and Luangrath 2022). While other theoretical perspectives focus more on the consequences of developing ownership feelings, Pierce et al (2003) theory of PO offers a sound framework to explore the meaning behind ownership feelings arising and causes for its development. Given that focus of this study is to explore ownership feelings among BEV

consumers by understanding the psychological mechanisms, cognitions, and behaviours of owning a BEV, the theory of PO offers the most relevant and suitable lens to explore this. Consequently, the preceding section focuses on reviewing PO theory and its core elements. Figure 3 illustrates the various ownership theories used in academic literature:

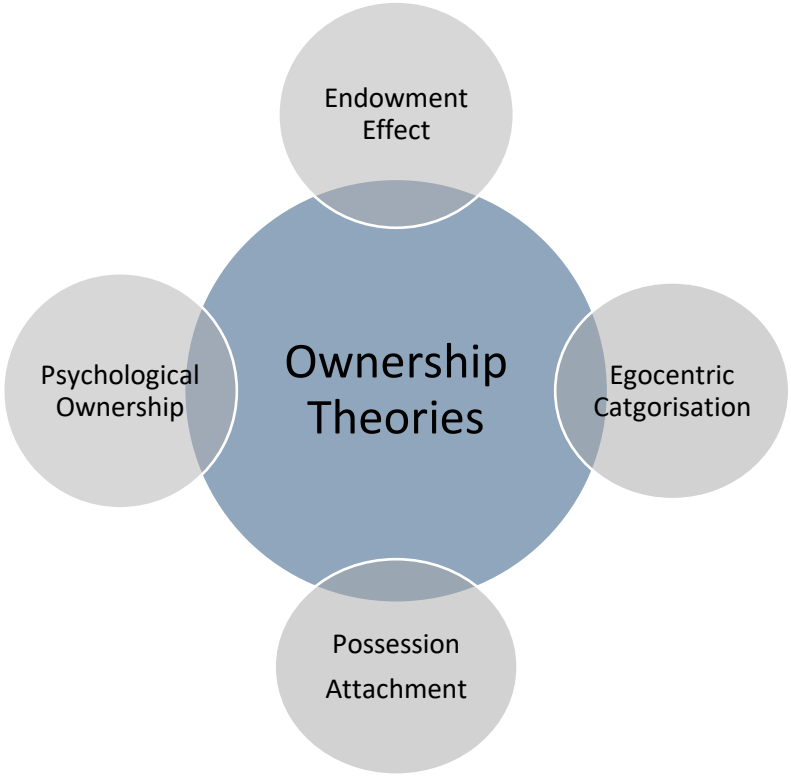


Figure 3 Ownership Theories

2.5 Theoretical Origins of Psychological Ownership

2.5.1 Individual Psychological Ownership

Articulated by Pierce and his colleagues, the theory of PO first captured the attention of scholars in organisational behaviour. This theory was introduced to understand how employees in an organisation develop cognitive attachment towards; a work project, the work space, the organisation, or even the job itself (Pierce et al. 2001; Pierce et al. 2003; Van Dyne and Pierce 2004). Feelings of PO can be described as a cognitive and emotional response to a target, provoking a feeling of possessiveness that drives a sense of ownership (Pierce et al. 2020). In reality, this occurs in instances such as “I feel this desk space is mine”

or “I feel this job is part of me” (Pierce and Jussila 2011; Liu et al. 2012; Kim and Beehr 2017; Taylor 2022). The following definition was proposed by (Pierce et al. 2003, p.86) to define PO:

“*the state in which individuals feel as though the target of ownership or a piece of that target is “theirs” (i.e. “It is mine!”)”*

The definition therefore demonstrates that possessiveness and being psychologically bounded between the self and the target is at the core of the construct. Hence, why it is logically sound to not only apply this to materials such as a car or a handbag, but also to something abstract such ideas, a brands, or a family members. Consequently, PO expands on the conventional view that ownership goes beyond just materials and objects but targets too. For these feelings to arise, there is a belief that socialisation must have some influence (Dittmar 2004). This echo’s the work by Furby (1978) who implied that feelings of “mine” and use of its word starts early in human life around the age of three and evolves enroute to adulthood.

The development of PO is grounded on the pioneering works of early scholars who questioned the essence and meaning of “what is mine” (Porteous 1976; Furby 1978). Therefore, it is reasonable to argue that PO is a cognitive sentiment that embodies an individual’s beliefs and thoughts and is constructed partly by innate and partly by learned behaviour (Hillenbrand and Money 2015). While there have been some contrasting viewpoints on PO put forward by other scholars (Avey et al. 2009; Avey et al. 2012), the work of Pierce and his colleagues remain the most used concept for understanding PO in academic research, particularly in the field of consumer behaviour (Peck and Shu 2018).

Since PO emphasises on the cognitive processes related to ownership, it is distinctly different to from legal ownership which is otherwise underpinned by ownership through a legal title. Beyond this, another key distinction from legal ownership is the dimension of time. Jussilia et al. (2015) argues PO cannot be measured by whether individuals have it or not. In other words, PO is not measured based on whether it is ‘on’ or ‘off’. Rather, an individual is said to begin to experience PO the moment the target or material arises and strengthens when attachment to its characteristics comes to fruition (Jussila et al. 2015).

Research concerning PO is mostly concentrated in organisational and management related fields focusing on job-related ownership, suggesting consistent interest among scholars in exploring the effect and presence of PO of intangible targets. Beyond this, the documentation and attention on PO in other disciplines is rapidly growing, with empirical findings emerging across multiple fields and settings over the last decade. Recent research in disciplines such as healthcare (e.g. Mifsud et al. 2019; Muthu et al. 2021), sustainability (e.g. Fielding and Dean 2022; Wang et al. 2023) and information and technology (e.g. Song 2015; Poretski et al. 2021) have demonstrated applying PO theory successfully.

Joining this growing body of literature are consumer behaviour scholars who have expressed determined efforts to deal with the concept of PO particularly, within marketing literature. Indeed, this theory has profound implications on how individuals behave particularly when attaching meanings to possessions and products and perceiving them as symbolic components of the self (Peck and Shu 2018). Interest in this field was accelerated by a series of conceptual papers calling for consumer behaviour researchers to explore PO outside of organisational studies (see: Hillenbrand and Money 2015; Hulland et al. 2015; Jussila et al. 2015). Since then, the marketing landscape has applied PO theory in intangible settings, such as music streaming services (Sinclair and Tinson 2017), as well as tangible products such as furniture, clothing and car sharing services (Gineikiene et al. 2017; Peck and Shu 2018; Szamatowicz and Paundra 2019; Morewedge et al. 2021; Zhang et al. 2023). Moreover, parallel with advancements in technology and the digital age, there has been a rise in online communities, predominantly in the controversial world of metaverses. Subsequently, PO has been considered in these contexts including; digital possessions (Belk 2013; Watkins et al. 2016) and augmented reality (Poretski et al. 2021; Yuan et al. 2021) thereby demonstrating wide spread application of this theory. On the whole, it is evident that scholars in this domain have drawn significant attention to the theory of PO in relation to positional ownership and the emergence of attachment feelings towards possessions (Furby 1978; Belk 1988; Pierce and Jussila 2011).

In reference to BEV ownership, the application of PO theory is limited with no study yet to present the effects of feelings of ownership in this perspective. Although not directing involving BEVs, one study by Paundra et al. (2017) did explore how feelings of PO shapes

consumers ownership feelings when the consumer uses an ICE car through a car sharing service. The findings conclude attributes such as price and parking convenience does influence intention to select a shared car through the moderating role of PO. The study also found, when individuals tend to develop feelings of PO towards a car, irrespective of how low the prices of car sharing may be, the intention to use a car sharing service is low. This suggests in addition to car attributes, psychological disposition seems to play a key role in car ownership behaviour. However, despite this study indicating how feelings of ownership towards the car may be impacted, it remains unclear how this takes place with those who attain full legal ownership of their car, particularly as time spent interacting and experiencing a possession holds a significant role in developing ownership feelings (Peirce et al. 2003 and Peck and Shu 2018). Hence, there is a need to fill this knowledge gap and seek why feelings of PO develop in car ownership, particularly towards BEVs and more importantly what drives these feelings to develop.

2.5.2 Collective Psychological Ownership

Thus far, the state of PO has been discussed as being directed at one individual or describing an individual's perspective that is, IPO (individual psychological ownership). However, development of this theory has led scholars to believe that PO can manifest on a collective level also (Pierce and Jussila 2011; Dawkins et al. 2017; Peck and Shu 2018; Peck and Luangrath 2022). Unlike individual PO, collective psychological ownership or (CPO) proposes collective feelings of ownership towards a target or possession can manifest at group level. Hence, ownership feelings are said to be collectively shared by group members who share a possessive mind-set by feeling a target or possession is 'ours' and 'we own it'. This implies that activation of the collective self is necessary for CPO to transpire, as each member becomes aware that not only themselves (mine) but also others (ours) (Peirce and Jussila 2011, Peck and Laungarth 2022). In doing so, the target or possession is recognised as being part of the "extended us" (Belk, 1988). The definition of CPO emerged from Pierce and Jussila (2011, p.812) who proposed CPO is:

"the collectively held sense (feeling) that this target of ownership (a piece of that target) is collectively "ours".

CPO has predominantly been considered in the field of organisation behaviour, with findings suggesting that collective recognition and common feelings shared among employees towards the organisation can lead to increased motivation, engagement, and effectiveness of group projects (Dawkins et al. 2017; Pierce et al. 2020). Therefore the underlying motives behind CPO stem from group-level attachment, which strengthens the ties between group members and subsequently enhances group identification (Wiggins 2018). The genesis of CPO therefore constitutes with the social identity theory assuming that individuals are motivated to assess and compare their own group with out-groups to create or extend their social identity (Tajfel and Turner 1986).

In consumer research, scholars have only recently begun to question how and under what conditions CPO may emerge. For instance, Nijs et al. (2021) discovered social groups that symbolise high degree of patriotism not only hold the view that their country is “ours” but firmly believe that “we” should be the ones to decide future matters. Using the context of ‘Brexit’ the participants were in support of the idea to of the UK to exist the EU on the basis of feeling ‘our’ territory and ‘our’ land is threatened and challenged with rising immigration. This indicates that when feelings of CPO get threatened this has the potential to instigate an active role of a “stewardship” as measure to protect what is collectively owned and invoke a negative reaction (Peck et al. 2021; Peck and Luangrath 2022). The subject of negative collective ownership behaviour is consistent with the recent controversies seen in social media. The recent rise of TikTok and its acceptance in the United States has been scrutinised by governors that question who controls users information and its content (Trautman 2022). This has sparked collective projects amongst its users to promote content that ridicule the lack understanding shown by governors towards TikTok as a response to signal collective solidarity and ownership that this platform is “ours” and we should be entitled to the ownership of ‘our’ content. Therefore, demonstrating CPO may not necessarily be just towards physical entities, but may also be felt psychologically. Further evidence to support these ideas are scarce, and so given the lack of studies discussing this side of CPO this argument is left open for speculation.

Returning to the focus of this study, there is a lack of empirical and conceptual studies that present to what extent CPO may play a role when owning a BEV. Having said this, one study

by Szamatowicz and Paundra (2019), which looked at car subscriptions towards ICEs, indicated that in the absence of private ownership, the idea of CPO towards the car discourages consumers' intention to acquire the car. The study suggests that outcomes of car ownership, such as product satisfaction, are threatened when feelings of CPO are low as car ownership is no longer seen as a personal and individual experience. That is to say, positive ownership feelings towards BEVs may primarily be driven by feelings of IPO. However, despite recent interest in uncovering CPO, it remains unclear whether CPO can rival or perhaps co-exist with IPO in the same setting, with scholars calling for further work in this area (Morewedge et al. 2021; Peck and Luangrath 2022).

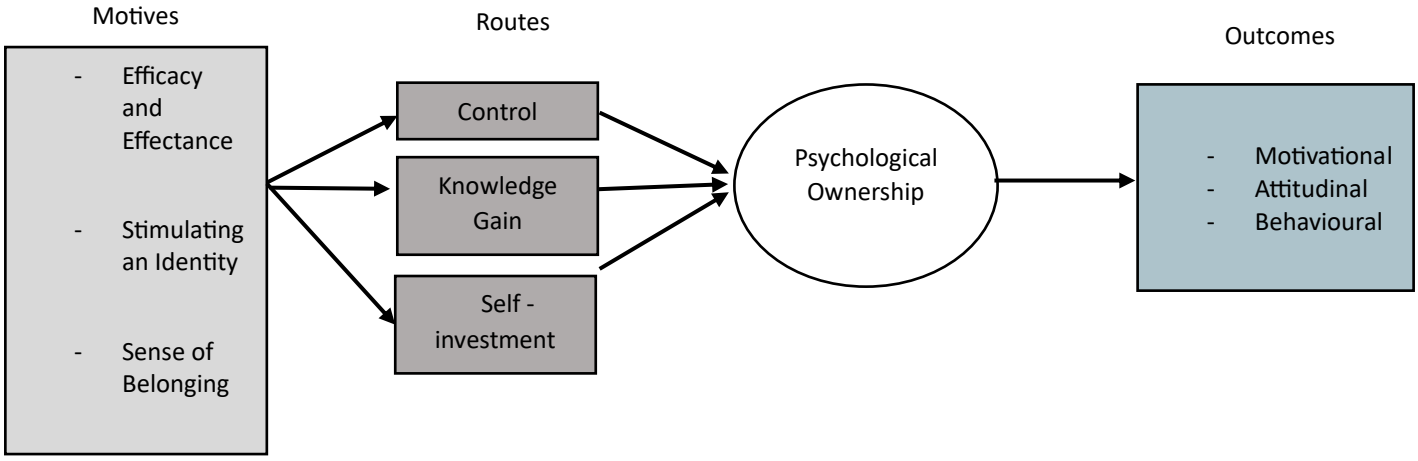
One of the key aspects of BEV ownership is the pro-social behaviour it demonstrates towards protecting the natural environment. Consistent with the discussions presented on IPO and CPO thus far, it is reasonable to posit that those who own a BEV may go beyond feelings of IPO towards their car but also develop feelings of CPO with other BEVs owners for collectively recognising their efforts in protecting 'our' natural environment. This coincides with recent research by Wang et al. (2023), who found it is likely that those who develop feelings of collective ownership over their environment show more effort and care in protecting it. Based on this, further clarification of CPO in the context of BEV ownership is certainly needed. As such, this study will explore the development of both IPO and CPO to understand the key psychological differences between them and the impact this has on the BEV ownership experience.

Following the presentation of the theoretical origins and conceptual core of individual and collective PO, the following section discusses the motivational conditions needed for PO. Pierce et al (2003) and Van Dyne and Pierce (2004) describe there are certain boundary conditions that an individual must experience for feelings of PO to develop. These being, (1) efficacy and effectance, (2) self-identity, and a (3) sense of belonging. Beyond this, there are said to be three routes or key experiences which entice feelings of PO to arise: (1) sense of control, (2) investment of the self and (3) intimate knowledge of the target (Pierce et al. 2003; Van Dyne and Pierce 2004). These theoretical foundations have been widely agreed upon by consumer behaviour scholars applying this theory (Jussila et al. 2015; Peck and Shu

2018; Felix and Almaguer 2019; Morewedge et al. 2021; Zhang et al. 2023). Subsequently, the next section reviews these motivations.

2.6 Factors Simulating Psychological Ownership

This section discusses the foundations of PO highlighting its motives and its routes. (Peirce et al. 2003) and Peirce and Jussila (2011), the scholars who presented IPO and CPO demonstrate that in both cases the underline motives and routes are the same. That being individuals need to experience one of a combination of these for feelings for PO to arise. Figure 4 presents an overview of the theory.



Adapted from Jussilia et al. 2015.

Figure 4 Psychological Ownership Core Elements

2.6.1 Psychological Ownership Motives

The development of feelings of PO begins with having one of three motivations for ownership as proposed by Pierce et al. (2003). Subsequently, the need for efficacy and effectance, stimulating self-identity, and sense of belonging all serve as key motives that lead to PO feelings. Pierce et al. (2003) noted that these motives do not need to be felt simultaneously but an individual would at least hold one of these motivations prior to ownership. However, without having some degree of attractiveness towards the target or material in the first place, triggering these motives is unlikely. As demonstrated by Shu and

Peck (2011), even with recurring exposure to an unwanted possession, this not enough to develop feelings of PO.

Efficacy and Effectance

Pierce et al. (2003) postulate that for us to feel in control of what we own, we explore the environment around us thus satisfying the need to be efficacious. In other words, the motive to understand causal efficacy prompts individuals to attain possession of objects in their environment (Pierce et al. 2003). Self-efficacy, also referred to as confidence (Avey et al. 2009) accounts for the beliefs in our ability to achieve tasks (Bandura 1995; Pierce et al. 2003). As argued by Furby (1978), having control over the outcome forms a significant part of self-efficacy. This explains why having control within a physical environment can lead to feelings of PO towards a possession (Furby 1978). Thus, the position of having control to achieve a desirable outcome is a psychological constituent that leads to feelings of self-efficacy, thus facilitating the emergence of feelings of PO (Olckers 2013; Peck and Luangrath 2018). These ideas merit the findings on efficacy presented by White (1959), who was among the first scholars to argue that feelings of efficacy arise when an individual feels a sense of control over the environment.

In relation to BEV ownership, self-efficacy has been debated by scholars on the basis that individuals need some degree of confidence in their ability to use the technology. It is well established that feelings of range anxiety and issues regarding BEV charging are debated self-consciously by the individual prior to ownership (Rezvani 2015, Asadi 2018). However, as infrastructure for BEVs continues to develop (i.e. access to charging at home, public charging or even at work), the belief, confidence and ability to execute the task of charging whether in a public or private domain, should allow for feelings of PO to develop. Thus, it is plausible to suggest for feelings of “mine” to arise when the individual feels a sense of confidence and ability that they have successfully overcome ‘perceived barriers’ with charging, resulting in a stronger and more satisfied ownership experience.

Stimulating Self-Identity

The second motivation extends the work on self-identity and possession developed by (Furby 1978; Belk 1988; Dittmar 1992). These scholars suggest that individuals identify themselves through possessions when an emotional connection is made and maintained with the self over time. Building on this, Peirce et al. (2003) suggest self-identity not only establishes connections between possessions and the self, but ownership can indeed act as a statement to reflect how we perceive our own identity. This connection forms the essence of our identity and is said to "link the psychological construct of an individual's self-concept with the symbolic value of goods purchased in the marketplace" (Grubb and Grathwohl, 1967, p. 22). Hence, one motivation to achieve ownership lies in our desire to recognises our possessions as symbolical illustrations of who we are i.e. 'the extended self' (Belk, 1998). Kunchamboo et al. (2017) found as feelings of ownership over the natural environment get strengthened over time, the sentiment of the extended self comes to fruition (nature becomes an extension of me). This finding draws on Hillenbrand and Money (2015) belief that self-identity is multilayered construct (core, learned, live, and perceived) that helps communicate the self either individually or socially.

In connection with BEVs, there is a lack of empirical findings confirming how self-identity shapes ownership feelings. Having said this, Szamatowicz and Paundra (2019) implied that individuals who hold identities which represent an active lifestyle such as surfing or hiking develop feelings of PO towards specific car types. For instance, off-road SUVs with roof racks not only serve its purpose to the owner but also symbolically express characteristics of their personality and lifestyle interests. On the other hand, Asadi et al. (2020) showed that individuals can develop feelings of ownership towards their car when the brand resonates with the individual's nationalities. Thus, feelings of "mine" towards an EV may be motived by from a brand heritage and brand nationality standpoint.

Sense of Belonging

The third motivation is served by a personal space or area where the individual feels connected to their possession (Pierce et al. 2003). Feelings of ownership may develop by the possession acting as a 'home base' or even providing psychological security (Watkins 2015).

Pierce and Jussila (2011) conveyed that personal spaces that are perceived as “my space” help provide comfort and in turn, develop feelings of ownership towards them. As a result, there is motivation to empower the self into through personalising the space or defending it (Pierce and Jussila 2011; Peck and Shu 2018).

While belongingness implies being attached to physical possessions, belongingness to non-tangible entities such as social groups echoes the sense of belonging. Online brand communities for instance serve as a destination for consumers to come together and share common brand interests (Kamboj and Rahman 2017; Nadeem et al. 2020; Chapman and Dilmperi 2022). In relation to BEVs and wider car ownership, the idea of car clubs and ‘car meetups’ is not a new trend among car owners as previously released by Algesheimer et al. (2005). However, because BEVs introduce new dynamics to ownership relating to the environment and technology use, it is possible BEV owners may feel a sense of belonging through their identity. That is to say, developing feelings of “mine” when the car relates to “me”. Extending this logic to brands, it is well understood individuals develop favouritism towards specific car brands (Koch and Mkhitaryan 2015; Hung and Lu 2018). Thus, it is not illogical to posit individuals that hold feelings of belonging to a particular brand perhaps because of loyalty or family traditions are more inclined to develop feelings of IPO towards their car. This will be particularly evident if the brand of the car echoes the identity of the individual such that the car acts as a place of home for expressing their identity, for example, someone who consumes luxury products. With regard to CPO, following on Kumar's (2022) conclusions on PO and online brand communities, it is possible that BEV owners develop feelings of CPO not only from a brand standpoint but as a group of individuals that own a BEV in comparison to other car drivers on the road. That is to say, feelings of CPO may transpire among BEV owners as a result of collectively recognising they own BEV and as a group signal their commitment to behaving environmentally responsible. However, research has yet to establish these connections; and thus, this study will aim to contribute to this gap in the literature.

Since its introduction in 2003, these three motives have been widely accepted in studies concerning PO (Kirk et al. 2015; Dawkins et al. 2017; Morewedge et al. 2021; Zhang et al.

2021). However, Avey et al (2009) proposed two additional motivators for PO. Accountability and Territoriality are believed to equal to that of self-efficacy, self-identity and sense of belonging. Avey et al. (2009) believes individuals would feel PO when they express their actions to others, coupled with feelings of responsibility. That being, accountability stems from our need to hold control over the consequences of our targets, which we have assumed and recognise as extensions of ourselves. In contrast, a more preventative viewpoint of PO is likely to stem from to withholding possessions against threats. i.e territorial behaviour. However, other scholars challenge these claims and argue territorial behaviour should be regarded an outcome rather than a motive (Brown and Zhu 2016; Chen et al. 2023) therefore literature mainly refer to the three original motives introduced by (Pierce et al 2003).

Finally, stimulation (activation or arousal) has been suggested by (Pierce and Jussila 2011; Jussila et al. 2015) as a further motive. This motive corresponds to individuals seeking stimulation in their environment under conditions where arousal is possible. This stems from the need to control, care for and create a target. However, if this desire decreases, stimulation is unlikely. Thus, "whether people will settle for what is theirs now or pursue new (different) possessions (that could be theirs) is in our view dependent, in part, on the strength of an individual's need for stimulation (sensation)" (Pierce and Jussila, 2011, p. 48). However, this motive is not widely included as one of the main motives when discussed by other scholars who otherwise refer to main developments of PO (Pierce et al. 2003; Van Dyne and Pierce 2004) during theory development.

2.6.2 Psychological Ownership Antecedents/Routes

With the theoretical understanding of the motives to feel ownership outlined, the following reviews the routes for PO i.e., its antecedents. These routes can be considered as key experiences that can increase or decrease feelings of ownership. Pierce et al. (2003) proposed the following: (1) sense of control over a target, (2) gaining knowledge of the target and (3) investing the self into the target are three routes driving feelings of PO. These roots have been explored in literature concerning organisational behaviour and wider fields, such as consumer research (Peck and Shu 2018). Recently, a fourth route to PO has been

proposed. Self-object congruity has been offered as a proposition by Morewedge et al. (2021), which captures when the self and a possession share meaning associations in memory. Essentially, it is posited once a material or object has been acquired, which drives memory network nodes to the material or object with the self. However, this route has yet to be established and requires further investigation.

2.6.2.1 Sense of Control

Control within our environment is a fundamental human motive (White 1959). In that sense, control satisfies our need for effectance by fulfilling the desire to feel our actions are the cause of changes to the environment rather than being controlled within the environment (Peirce et al. 2003). It has been long understood in possession and ownership literature a sense of control plays a key role in driving feelings of "mine" (Prelinger 1959; Adler et al. 1983). Thus, the degree of control that a person exercises over a possession will influence the likelihood the ownership of that possession is experienced as "one with the self" or as proposed by Belk, (1988) 'the extended self'. In consumer research, scholars have dealt with sense of control as the main route to feelings of IPO. Here, control is understood to be an individuals' ability to interact and use a product as and when desired. Demonstrated by the work of Shu and Peck (2011) and Baxter and Aurisicchio (2018), individuals that develop a sense of control through physical touch, tend to gain feelings of ownership.

Relaying this information to BEV ownership, when observing that technology plays a major role (e.g using the plug-in to charge system), feeling a sense of control over the technology in the car seems highly relevant to those owners in developing feelings of IPO. Whilst literature has thoroughly discussed how EVs are perceived with various barriers towards its technology particularly in the adoption phase (Asadi et al. 2020; Singh et al. 2020; Adu-Gyamfi et al. 2022), when questioning the post adoption experience, it is logical to suggest technology would play a key role in fostering feelings of IPO.

In line with Gaskin (2012) and Kirk et al. (2015) thoughts, 'appropriating technology' that is; having an understanding how to use the technology, should strengthen feelings of IPO. It is argued that user interaction permits and encourage the individual to be curious about how the technology works and more importantly, how to gain control and manipulate it. Hence, as individuals feel a sense of control over how to use technology successfully, they should

possess stronger feelings of emotional attachment, which should driving feelings of “mine”. Since the plug-in to charge system of BEVs plays a major role in facilitating the ownership experience of BEVs, not only understanding how this works but also feeling in control over how to interact with the various public and private charging stations should strengthen over time, invoking feelings of IPO over the car.

Having said this, as advancements in car technology continue to rise as manufacturers compete with each other to offer the latest innovations, vehicle automation and autonomous driving may prove to threaten PO because of a lack of control. There is much literature on how delegating tasks to machines restricts the feelings of being in control, namely because technology is not transparent and is somewhat mysterious (Puntoni et al. 2021; Longoni and Cian 2022). Brasel and Gips (2014) observed that product satisfaction is greater when products offer physical or haptic feedback responses as opposed to voice or touchscreen interfaces. In a more recent study, Smith (2022) concluded that feelings of PO are threatened and thus weakened, when the technology in possession can operate autonomously. It would therefore be interesting to observe this in the context of BEV ownership, where automation such as self-driving is slow being diffused in BEVs in preparation for a fully automated car future.

With this in mind, it seems unclear whether in the presence of automated technology, feeling in control in other parts of the technology overrides the overall feelings of control. Hence, there exists a gap in understanding the role that sense of control plays in highly sophisticated innovations such as a BEV. Given this study adopts an exploratory research approach, when collecting data, there is an opportunity to examine feelings of control in further detail to reveal a more accurate understanding.

2.6.2.2 Intimate Knowledge

The least studied route, intimate knowledge, is another means of achieving PO (Peirce et al. 2003). In line with previous discussions of the self and ownership, James (1980) was the first to proclaim when individuals develop a relationship through knowledge learning with the potential target of ownership, it becomes part of the self. That is to say, gaining knowledge captures how individuals develop familiarity with an object through repeated interactions (Pierce et al. 2003). Consumer behaviour scholars have attempted to draw connections with

how knowledge gaining can lead to attachment to possessions. A study by Lastovicka and Sirianni (2011) concluded that physically and intellectually knowing the product forms the basis of why knowledge gain can lead to emotional attachment. Lastovicka and Sirianni (2011) note:

"Firearms, bicycles, and automobiles—all originated in the nineteenth century or earlier and, as such, rely on technologies with visible moving mechanical parts. Hence, because such technology is relatively more accessible to the average consumer, we believe intimacy has more of an opportunity to develop"

Building on this evidence, knowledge gaining has been theorised in conjunction with BEVs given how this takes place before ownership, such as learning about the difference between ICEs and BEV (Simsekoglu 2018). This knowledge gain continues to develop during its ownership cycle as BEVs are capable of delivering 'over the air' updates, modernising the features of the car over time (Efstathiadis et al. 2021). Hence, as the owner spends more time with the car and experiences technological changes, the more knowledge should be gained.

Beyond just the technological aspect, BEV ownership as shown by White et al. (2019) can signal environmentally responsible behaviour. This corresponds with the increased concerns shown by consumers to protect the environment (Lieven and Hügler 2021; Uren et al. 2021). In PO theory, Pierce et al. (2003) mentioned by feeling strongly linked to the environment, individuals can strengthen their feelings of ownership towards it. Hence, in sustainable settings these feelings can arise from being psychologically 'synced' with nature following regular interactions with it and learning about it, such as spending time or cleaning the natural environment (She et al. 2022). Süssenbach and Kamleitner (2018) theorise as individuals show perceived responsibility and moral obligation to care for the natural environment, as a result of gaining knowledge about the challenges faced in nurturing the natural environment. This could result in the formation of feelings of PO towards it and the objects used to achieve this. In relation to this study, it can be argued if an individual is said to act on their perceived responsibility to take care of "my" natural environment signalling

investment of the self into the environment, feelings of IPO towards the BEV may transpire as this symbolise exercising this behaviour.

In the case of CPO, these feelings are typically accompanied by perceived responsibility from group members who feel collective responsibility for what they own (Pierce and Jussila 2011; Gineikiene et al. 2017; Wang et al. 2023). Süssenbach and Kamleitner (2018 p.217) conceptualise in sustainable behaviours, feelings of CPO may arise when individuals share a common feeling that "we should take care of what is ours". Hence in BEV ownership, owners may develop feelings of CPO on the collective recognition that together owners are protecting the environment to take care of what is 'ours'. This raises an interesting question that if CPO is indeed felt among BEV owners, are these feelings motivated by the object of the car itself (we own a BEV) or because owners collectively feel shared responsibility for their environment?

Exploring these considerations in this study will provide knowledge to inform our understanding of CPO and sustainable behaviours.

2.6.2.3 Investing the Self

The final route builds on the views of (Sartre 1943), who stated "our words, thoughts and emotions that stem from one's labour is a representation of the self". Peirce et al. (2003) proposed that investments in one's ideas, effort, and time drive feelings of "mine" to emerge. Drawing on the literature concerning possession and ownership, scholars collectively agree that having the opportunity to invest 'psychic energy' allows the individual to not only shape the possession but foster self-identity (Csikszentmihalyi and Halton 1981; Belk 1988). In other words, the opportunity to invest the self into possessions strengthens the ability to build on the notion of "mine" (Pierce et al. 2003). Csikszentmihalyi and Halton (1981) demonstrate the most appreciated possessions are those that represent success and desired identity, as opposed to monetary value or its function. It is no surprise therefore, that investment in the self may arise in the form of implementing an idea, investing time or effort or even creation and customisation (Van Dyne and Pierce 2004).

When concerning ownership of a BEV, naming a car is a common and well adopted practice. Indeed, naming things that you own is perhaps more common than uncommon, particularly

when objects or materials were created or customised. For instance, study by Stoner et al. (2018) showed how customers at Build-A-Bear assign a name for the stuffed animals and register this officially to receive a birth certificate, enhancing feelings of ownership. In the case of car ownership, individuals that choose to name their car tend place considerable thought into the name referencing another entity or experience close in their lives (Stoner et al. 2018). Literature on naming possessions has presented well defined conclusions stating that when we associate a name with a place, product or possession, feelings of emotional attachment arise (Belk 1988; Kleine et al. 1995; Bardhi et al. 2012; Watkins 2015; Ye and Gawronski 2016). In general, ownership of a BEV offers the owner with multiple ways to name their car. This could be either verbally or physically using number plates, or by assigning a name on the infotainment system. Nonetheless, investment of the self serves as a significant route in driving feelings of IPO.

On a collective note, collective recognition of the shared investment, time, and energy made by each BEV owner may instil; feelings of CPO of a group of BEV owners to arise. Findings presented by Peck et al. (2021) showed when consumers invest time into a public good such as cleaning and protecting the natural environment this not only signals stewardship behaviour, but when observing community members are also following suit, there is a collective recognition that "we" are behaving pro-socially hence eliciting feelings of CPO. However, the study's context failed to identify exactly what ingroup may claim feelings of CPO, thus raising questions on how likely this is to transpire.
Having said this, recent conclusions drawn by Wang et al. (2023) support the findings of Peck et al. (2021), noting that CPO of nature stems from collective recognition and appreciation by others who share similar pro social and environmentally responsible beliefs. Consistent with this line of reasoning, it is possible this is also the case with BEV owners, given that one driving factor for ownership is the need to fulfil beliefs and values to behave environmentally responsible (Aliyev et al. 2019; White et al. 2019; Asadi et al. 2020; Sharma et al. 2020). Hence, on a collective note, shared investment of the self may play a key role in facilitating CPO in the context of BEV ownership. Given the lack of empirical findings to support this theory, this study aims to fill this knowledge gap.

2.7 Consequences of Psychological Ownership

Following the discussions about the motives and routes to PO, this section reviews the outcomes of developing feelings of ownership. Peck and Luangrath (2022) believe observing the outcomes of both IPO and CPO in consumer behaviour is important, as not all individuals develop a sense of attachment to their possessions in the same way. Moreover, as noted by Pierce et al. (2001, p.299) "feelings of ownership have important behavioural, emotional, and psychological consequences" thus, PO can be a psychological predictor for various motivational and attitudinal to behavioural effects (Peck and Shu 2018).
Hence, it is necessary to consider the outcomes of PO on an individual and collective level, and thereby treat these as predictors for consumers led outcomes.
In consumer behaviour research, a range of consequences have been argued shown to be an outcome of feelings of PO; an increase in pro-environment behaviours (Süssenbach and Kamleitner 2018; Peck et al. 2021; Wang et al. 2023); product -to-self judgment (Chung and Johar 2018; Zhang et al. 2023) and product valuation (Dommer and Swaminathan 2013; Brasel and Gips 2014; Li and Atkinson 2020). Beyond this, negative outcomes such as territorial behaviours have also been suggested (Kirk et al. 2018), however given this concept was only conceptually proposed further investigation is needed to validate its argument.

Propositions by Süssenbach and Kamleitner (2018) suggest that feelings of IPO and CPO towards the natural environment should lead to more pro-environmental behaviours because the individual will regard this as part of the self-concept, leading to a sense of taking care of it. The findings by Peck et al. (2021) provide empirical evidence to support this. They found those that kayak at the same lake frequently cleaned the lake from toxic liquids that could otherwise harm aquatic life as their IPO towards the lake and the natural environment strengthened. To clarify their findings further they drew upon Davis et al.'s (1997) stewardship theory that posits individuals tend to feel "stewards" which drives them to behave in pro-social manner and not based on their own interests. Beyond this on a collective note, Peck et al. (2021) found feelings of collective ownership can drive the group to take care of the space affiliated with it (e.g. public spaces). When individuals collectively

feel a high degree of ownership towards a park despite it being psychologically, more effort is exhibited in taking care of "our" park such as protect the wildlife, litter picking and walking only on designated paths. (Peck et al. 2021).

While this idea of stewardship is yet to be conceptualised or empirically tested in accordance with BEV ownership, it is sensible to suggest stewardship behaviours towards public chargers triggered by CPO feelings may occur. A recent study by Morewedge et al. (2021) infers individuals tend to show stewardship towards public shared goods in which they value, and this feeling is strengthened by high levels of CPO. Morewedge et al. (2021) posits that those who rely on public goods as opposed to privately owned ones, are more inclined to notify other users when challenges or issues are faced with the good. Hence, in the case of public BEV charges when technical issues arise (i.e out of order) BEV owners may feel it is necessary to notify other BEV owners as well as the supplier about issues faced with "our" charger.

Another outcome of PO relates to the effect it has on self-identity. The notion that products, possessions and targets has the power to systematically change the mental perception the individual has towards it has been appreciated by scholars in consumer research (Ahuvia 2005; Chung and Johar 2018; Weiss and Johar 2018; Zhang et al. 2023). Reference to egocentric categorisation theory offers some valuable wisdom to unpack this (Tajfel and Turner, 1986). Consumers often see themselves as possessing the characteristics of products they own using the "mine – me" sensitivity, signifying what scholars describe as activated product related identity (Weiss and Johar 2018; Zhang et al. 2023). Consequently, holding feelings of IPO over a possession can stimulate activated product related identity to either extend an existing identity or create a new one. This notion therefore draws parallel with Belk's (1988 p.133) work on the extended self that similar to our minds and body parts we perceive our possessions as key component that defines and expresses our sense of self "a major contributor and reflection of one's identity" (i.e. part of 'ME').

For instance, it was found that fake behaviour, such as cheating, is amplified when the individual wears fake sunglasses as opposed to others who attire authentic sunglasses (Gino et al. 2010). Similarly, holding a pen from a prestigious university triggers more creative and academic thoughts (Weiss and Johar 2013). In reference to the context of this study, the

extent to which feelings of IPO over a BEV may stimulate activated product related identity would reveal key knowledge regarding ownership feelings and identity.
Given that characteristics of BEVs include innovation and environmentally responsible observing how feelings of IPO may activate one or more identity(s) derived from the car remains unclear.
Beyond this, it is unclear whether feelings of CPO also lead to some degree of identity change whether self-identity or group identity. However, given that CPO constitutes with social identity and shared collective recognition (Pierce and Jussila 2011; Peck and Luangrath 2022), feelings of product-to-self judgment may exist towards the group. Therefore, it is necessary to explore this in the study to gain an understanding of the differentials between individual and collective feelings of PO and the identity related outcomes.

Product valuation has also emerged as a potential outcome of PO where studies concerning valuation as a consequence draw upon the endowment effect (Kahneman and Thaler 1990). The Endowment Effect argues that owners value a possession or target more highly than non-owners (Kahneman and Thaler, 1990). Consumer researchers acknowledge that endowment effects could be caused by a possession - self link, as individuals believe that a possession is valued more if they think they own it (Dommer & Swaminathan, 2013; Morewedge et al. 2021). Here, possessions can be regarded to be psychologically part of an individual's endowment driving feelings of valuation towards it. For instance (Fuchs et al. 2010; Brasel and Gips 2014) show that individuals strongly monetarily value possessions that have feelings of PO towards them compared to those that do not. Moreover, Peck and Shu (2009) suggest that feelings of ownership over a physical possessions result in stronger valuations than those which are intangible. In reference to BEV ownership, in addition to feelings of legal ownership feelings of IPO may strengthen valuation. Whereas in the absence of legal ownership, such as car sharing or renting a BEV, it is possible feelings of PO may substitute legal ownership when evaluating product valuation (Morewedge and Giblin 2015).
Other valuations such as product satisfaction and positive word-of-mouth communication have been theorised as outcomes of PO (Kirk et al. 2015; Li and Atkinson 2020). Individuals may share their experiences and perceived valuation of owned possessions with others. Car

owners' express connoisseurship to others through word-of-mouth to express their valuation and expertise with their car and convey self-enhancement (Lisjak et al. 2021). Thus, feelings of IPO over a BEV has the potential to increase word-of-mouth communicaiton. Simuarly on collective level, Kumar (2019) indicated when individuals share feeligns of CPO towards an online brand community this can lead to positive word-of-mouth communication because of the value attributed to the group. This knowledge therefore offers ample evidence to explore whether this also emerges for BEV owners who feel a sense of CPO. Furthermore, raises questions to what extent social recognition for being part of those that own BEV irrespective of the brand, as well as sharing feelings of caring for "our" environment, may lead to positive word-of-mouth.

2.8 Exploring the role of Emotion in Psychological Ownership

In the original conceptualisation of PO, Peirce et al. (2003) stated that emotional attachment can act as an antecedent or outcome of PO to emerge, however it was unspecified as to what emotions might be involved. In contrast, in studies concerning legal physical ownership, the role of emotions such as happiness, has been well documented (Hayase and Ura 2015; Gilovich and Gallo 2020; Odermatt and Stutzer 2022). For instance, Guevarra and Howell (2015) explained that owned materials that offer experiences such as sports equipment can trigger feelings of happiness by fulfilling a basic psychological need. However, how and under what conditions emotions play a role in conjunction with feelings of PO, remains unclear, suggesting a theoretical gap in the literature. Although some attempts have been made to explore the role of emotion in PO theory, the limited empirical evidence about this relationship suggests a lack of theorisation and application. Theorising the role of emotions is therefore an appropriate next step in building on the extant literature.

In the attacking view that emotions and feelings are alike, scholars often find themselves using the terms interchangeably. While it is clear scholars acknowledge emotions contain feelings, there exist little knowledge to suggest emotions *are* feelings (Prinz 2005; Barrett et al. 2016). Thus, presenting a brief overview of the differences between the two offers a clearer argument on how to navigate reviewing psychological attachment responses in PO.

The conceptual foundations of emotions and feelings stem from a vast scope of literature developed in psychology, neuroscience and philosophy bounded by a series of psychologist centred theories concerning these reactions (Gu et al. 2019). Most notably our understanding is fashioned by the groundbreaking James-Lange theory of emotion (Cannon 1927). This conceptual foundation later strengthened by the views of Cacioppo and Gardner (1999) and (Cabanac 2002) argue emotions are an automatic but complex psychological response to a situation. In doing so, emotions of which include happiness and anger are often brief, intense and relatively short lived with potential to drive physiological changes such as changes in heart rate. On the other hand, feelings are perceived as subjective by the individual and are forged based on experiences or interpretations of these emotional responses (Harlow and Stagner 1932; Prinz 2005) Hence, feelings are somewhat bounded by the individual's beliefs and social norms therefore involve more prolonged cognitive processing in response to their conscious experience (Gross 1998). Nonetheless, discourses covering emotions and feelings in consumer research do recognise the overlapping nature between the two however maintain a consistent dialogue that due to the cognitive processing involved with feelings, this manifest consciously whilst emotions may manifest subconsciously or consciously (Belk 1992; Bagozzi et al. 1999; Barrett et al. 2016). In that regard, it is clear why the the terms emotions and feelings are used interchangeably as the context being observed may involve understanding the individual's conscious or subconscious behaviour.

In conjunction with the self and ownership feelings, Ruvio and Belk (2013) argues emotion capture the true feelings of the self, as they are not only felt but expressed, hence are felt subconsciously. Gross (2015) supports this notion, arguing emotions are highly significant in understanding consumer behaviour as they convey the individuals experience and thoughts before, during or after an event has taken place. This explains why an individual can behave towards a possession in the same way as they feel and behave towards the self (Lewis et al. 1989; Bagozzi et al. 1999; Tracy et al. 2007).

However in reference to the context of the study, car owners expressing emotions from driving or owning a car has long been understood to be key aspect of ownership (Sheller 2004). Although in this regard, most studies that consider emotion in BEVs, and wider EVs

seem to focus on emotional responses towards intention to own, as opposed to capturing the feelings that might arise during the ownership experience. Findings by Moons and De Pelsmacker (2012), for instance indicate that feelings of joy and pleasure are just as important to consumers as usage intention when making a decision to own an EV. A different viewpoint shared by Rezvani et al. (2017) argues that individuals who feel negative emotions such as sadness when reflecting on the negative environmental impact their existing ICE car causes, are motivated to switch to EVs. Nonetheless, it is clear these studies observe the primary emotions such as; joy, fear, sadness and trust which are biologically distinct to us and provoked via neurophysiological changes (Plutchik and Kellerman 1980; Bagozzi et al. 1999). However, given this present study aims to connect emotion with the ownership experience it is inconsistent to assume these findings present the relevant knowledge needed, since these studies do not only generalise EV of which may include HPEV and PEV, but also study emotion as a direct antecedent to intention to adopt. Therefore, these studies may not accurately reflect how emotions can accelerate and enrich feelings of ownership.

In other words, since these studies observed emotions without collating its relation to 'the self' they overlook an entire subsection of emotions concerning the self known as 'self-conscious emotions' (Tracy and Robins 2004; Tracy et al. 2007; Tracy and Weidman 2021). Consequently, feelings of; pride, guilt, embarrassment, shame, and envy describe the internal cognitive feelings that emerge following evaluation of the self (Cheek and Briggs 1982; Lewis et al. 1989; Tracy et al. 2007). Early work put forward by Furby (1978) and Dittmar (1994) suggests what individuals choose to possess and own is a reliable measure of self-accomplishment. With that in mind, feelings of pride are closely linked to a sense of accomplishment and success (De Hooge and Van Osch 2021). Moreover, pride has been shown to play a key role when evaluating the self particularly with self-identity (Tracy et al. 2013; Tracy and Weidman 2021) which in-itself is one of the main motives for feelings of PO (Pierce et al. 2003). In line with this reasoning, considering the role of pride in conjunction with PO is justified.

Tracy et al. (2007) proclaims we not only strive to possess materials and objects which resemble symbolic meanings as we believe that doing so will promote our status, but also

because the pride we experience when we succeed feels good. Pride as argued by Tracy et al. (2007) is a multifaceted emotion subcategorised as *hubristic* pride and *authentic pride*. Hubristic pride can be described as acknowledgement of the self met with self-entitlement and so, hold an egocentric belief that one is superior to others (Tracy et al. 2007; McFerran et al. 2014). For instance, "The exam was easy for me because I am smart" (Tracy et al. 2007 p. 520). Whereas authentic pride describe having feelings of proudness towards their achievement recognised by their effort and hard work "I did well on this exam because I studied hard."(Tracy et al. 2007; Barrett et al. 2016).

Hence, pride can sometimes be viewed as either positive or negative. Nonetheless, whilst these forms of pride have been posited on several occasions by (Tracy et al. 2007; Tracy et al. 2013; Tracy and Weidman 2021), scholars have not always adhered to these two forms but rather collated these as a singular facet (Antonetti and Maklan 2014; Septianto et al. 2020; Zhao 2020; Kaur and Verma 2023). It is clear therefore that these facets of pride are felt at an individual level, indicating is any relationship with PO is present this is likely to take place at an individual level. Beyond these two facets of pride, scholars have considered how feelings of pride may occur on a collective level. Consequently, collective pride has recently emerged as another facet of a positive celebratory emotion extending on the underlying principles of authentic pride but, capturing this on group level (Sullivan 2014; Williams and Davis 2017; Ahuvia et al. 2018). The following section explores these in relation to the theory of PO individually.

Table 2 Facets of Pride Summary

Type of Pride	**Description**
Authentic	A positive emotion that emerges after a specific achievement describing a sense of accomplishment and success.
Hubristic	Arises from evaluating the self and feeling superior to others because of their successes.
Collective	A celebratory emotion occurring at group level in response to a feeling of achievement and success between group members.

Source: Tracy et al. (2007) and Sullivan et al. (2014)

2.8.1 Authentic Pride

The first of the two facets authentic pride is a positive feeling that arises based on accomplishments hence elicited by genuine feelings of self-worth (Tracy et al 2007). Feelings of authentic pride have been debated in consumer research (Onwezen et al. 2013; Schneider et al. 2017; Septianto et al. 2020) but lacks theorising with PO theory. Sinclar and Tinson (2017) study drew parallels between feelings authentic pride and feelings of ownership. The findings argue authentic pride instigates feelings of IPO in other words, act as an antecedent. While there is much to learn from the study, the study's focus was of non-tangible goods, namely music streaming services. However, give this study concerns a tangible good, collating with the outcomes of Sinclar and Tinson (2017) can be questioned given that other scholars such as Yap and Grisham (2019) believe emotion felt towards a physical possession is believed to be stronger than that towards an non-physical possession. Nonetheless, findings by Ahuvia et al. (2018) suggest for the most part, pride in ownership tends to surface among consumers. In their study, one participant stated expressing high levels of authentic pride about the first car as this represents 'my' hard work which strengthened feelings of "mine" towards it.

On the topic of BEVs, whilst feelings of pride are likely to emerge from the owner reflecting on their efforts taken to own a BEV, it has been suggested that perhaps feelings of authentic pride may arise as a result of successfully interacting and using its technology. Conceptualised by Kirk et al. (2015), technology appropriation should not only lead to IPO, as discussed earlier, but may be mediated through feelings of authentic pride. Kirk et al. (2015) believes since technology appropriation overcomes self-efficacy barriers, this should privately signal accomplishments and successes to the self, thus eliciting in feelings of authentic pride. This theorising extends the thoughts offered by Ziamou et al. (2012), who suggest individuals who attribute feelings of success and achievement in relation to owning a new innovation, particularly one in the early adopters phase, may develop feelings of closeness with it. However, in both studies, these were put forward as propositions without providing empirical evidence to support these claims. Given that technology and innovation is at the centre of BEV ownership, exploring feelings of authentic pride in this setting is justified and contributes to a gap in knowledge.

2.8.2 Hubristic Pride

Hubristic pride describes having the global self feeling superior to that of others (Tracy et al. 2007). Hence, hubristic pride is not a reflection of hard work, effort, or investment but rather channels self-enhancement as "the desire to maintain, protect, and enhance one's self-esteem" or increase the positivity of identity (Leary et al. 2007, p.319). This coincides with findings from McFerran et al. (2014 p. 461) who proclaims "people high in hubristic pride constantly strive for the appearance of perfection to signal their self-worth". Therefore, hubristic pride can be thought of as an output to express the self's achievements. Hence, this facet of pride should be an outcome of feelings of ownership as it is not a reflection of effort. McFerran et al. (2014) offered interesting findings connecting hubristic pride and ownership of luxury branded goods. Their findings revealed individuals perceive ownership of luxury branded goods as an indicator of social superiority, where possessing and consuming such materials elicit feelings of hubristic pride. These conclusions offer a convincing explanation as to why PO theory advocates "ownership helps people define themselves, express their self-identity to others, and maintain the continuity of the self across time" (Pierce et al. 2003, p. 89).

In relation to this study, there is a little empirical evidence that draws on hubristic pride with PO theory. However, by building on the ideas of McFerran et al. (2014), it is plausible to suggest that owners of a BEV may find their car elevates the self by signalling environmentally responsible behaviour to others which drive feelings of hubristic pride. This view resonates with Ferguson et al. (2011) findings, who suggests those who choose to behave environmentally responsibly feel superior to those who do not. Furthermore as BEV are currently perceived by some as a luxury car choice from a financial point of view (Hardman and Tal 2016; Münzel et al. 2019) conceptually it is reasonable that feelings of hubristic pride might emerge by BEV owners who hold feelings of "mine" as it signals the time, effort and risk in seeking ownership of a BEV i.e. investment of the self . Indeed, this area needs further development thus this study will explore this further during the data collection phase.

2.8.3 Collective Pride

In a similar fashion to how groups can immerse themselves in feelings CPO, pride on a collective level may also be felt when feeling part of a group (Decrop and Derbaix 2010; Sullivan 2014; Williams and Davis 2017). This celebratory emotion there implies this emotion emerges after an experience has taken place and hence why this is believed to be thought of as a consequence of CPO (Harth et al. 2013). The findings by Ahuvia et al. (2018) offer convincing empirical evidence on how this facet of pride emerges. It was revealed that those who supported a football team and felt connected to other fans stimulates feelings of collective pride to echo their satisfaction. Ahuvia et al. (2018) explains since group members collectively feel shared responsibility to support 'our team' to offer fan stability and promote recent successes they are keen to express their achievements on a collective note to signal to fans from other clubs. Although this seems rather hubristic in nature, Ahuvia et al. (2018) believe this pride is authentic, as group members celebrate their efforts, commitments together to signal the strength of the identity of the group. Thus, it can be said that collective pride is most notable among those who strongly identify within the group. Having said this, it remains unclear whether pride must first be felt at an individual level (towards the self, i.e. authentic pride) before eliciting feelings of collective pride.

In reference to BEV ownership and in particular CPO theory, to extent to which collective pride arises from BEV owners is yet to be theorised. Can feelings of collective pride emerge among BEV owners as part of a celebratory emotion to signal their effort and commitment in behaving environmentally responsible? Similar to how recycling was once an individual act but is now regarded as a widespread collective effort (Catlin and Wang 2013; Donnelly et al. 2017), BEV owners on a collective level may feel their decision to own a BEV is morally the right one as to conserve and reduce negative impact on the environment thus signalling their collective intimate knowledge of "our" environment. A study by Sykes (2021) may shed light on this postulation where his study revealed when belonging to an exclusive club such as Harley Davidson motorcycle owners who often express the club's identity and exclusivity, feelings through matching apparel such as a jacket, this subconsciously and consciously provokes feelings of collective pride. In relation to BEVs, we are already aware of physical social signal of those who own a BEV compared with those who do not. BEVs in the Wales

and wider UK are marked with a green emblem to signal and differentiate their car from non-BEVs on the road (Department for Transport, 2021). Thus, feelings of collectiveness among BEV owners may already be present among owners subconsciously without formally communicating with each other. The extent to which this stimulates collective pride is yet to be explored. Therefore, these ideas serve as an interesting foundation to explore this supposition in this study.

2.9 Conclusion and Research Questions

This chapter reviewed and presented the extensive literature on the self and ownership, in particular shedding light on the main theory underpinning the thesis – Psychological Ownership (PO). The chapter first briefly scopes the field of sustainable transport, arguing why further research is needed to understand BEV ownership ahead of other developments in sustainable transport. Subsequently, literature concerning the self and car ownership is reviewed and highlights, why a car is perceived as a material possession that causes of feelings of attachment to arise towards it and why this is important in BEV ownership. Following this, the various theories concerning ownership are then presented and discussed before offering justification for choosing PO theory as the main theoretical lens for the study. It is worth noting that much of the literature on PO is situated within organisational behaviour research tailored to understanding feelings of ownership in work environment contexts. However, its application to consumer behaviour has proven to be a purposeful and valuable conceptual lens through which to investigate ownership feelings (Jussila et al. 2015; Peck and Shu 2018; Morewedge et al. 2021; Peck and Luangrath 2022). Finally, the theoretical foundations of PO are then presented alongside the motives and routes to PO, as well as its outcomes. Grounding this study on BEV ownership feelings using the lens of PO presents new avenues for the theory with potential to extend this theory by capturing the psychological aspects of the BEV ownership. Upon reviewing the PO literature, it became evident how feelings of ownership towards a BEV emerge are underdeveloped despite recognising emotional attachment towards cars is common (Dittmar 2004; Steg 2005; Gatersleben 2011; Ahuvia et al. 2018).

While consumer researchers have presented findings on the motives, routes and outcomes of PO, most studies approach PO only at an individual level (IPO) (Sinclair and Tinson 2017; Felix and Almaguer 2019; Yuan et al. 2021). However, following review of the literature, scholars have begun drawing on whether feelings of ownership can take place at a collective level (CPO) opening a new avenue to extend this line of enquiry (Pierce and Jussila 2011; Wiggins 2018; Pierce et al. 2020). Though, despite some attempts being made to explore CPO in consumer research (Szamatowicz and Paundra 2019; Nijs et al. 2021), none of these studies have attempted to qualitatively and quantitatively link the premises and theoretical grounding of PO theory observing both IPO and CPO in the same context, suggesting a gap in the theory development. Hence, this study responds to the calls made by Morewedge et al. (2021) and Peck and Luangrath (2022) to explore IPO and CPO together.

The review also argues that, the mechanisms by which PO routes lead to ownership feelings at both the individual and collective level has not been examined in BEV ownership. This is significant because when considering some of the characteristics of a BEV such as innovation and environmentally responsible, scholars have suggested these can lead to feelings of ownership through the routes to IPO and CPO such as sense of control and intimate knowledge (Kirk et al. 2015; Süssenbach and Kamleitner 2018; Smith et al. 2022). However, how this takes place in the context of BEV ownership where both IPO and CPO could exist together remains unclear.

One of the key emerging debates in this review was on the various outcomes of PO of which include activated product related identity and word-of-mouth communication (Weiss and Johar 2013; Kirk et al. 2015; Ahuvia et al. 2018; Chung and Johar 2018). However, it became apparent that little is currently known about whether IPO and CPO share the same outcomes or not, particularly in relation to BEV ownership. This study will therefore respond to these uncertainties and consequently extend the work on PO theory.

Finally, when reviewing the theory of PO it became evident that despite emotional attachment occupying a significant role in the how this feeling comes to fruition (Pierce et al. 2003b; Peck and Shu 2018), it is unclear exactly what emotions are instigated. Feelings of pride were understood to have a significant impact on the development and outcomes of

both IPO and CPO. Although feelings of car pride are not a new idea (Sheller 2004; Zhao 2020), ownership of BEV changes the dynamic of this feeling, questioning whether feelings of pride emerge as a result of being able to successfully gain control over the technology of the car (Kirk et al. 2015) or perhaps emerge as a part of a self-evaluation that drives a sense of superiority that by owning a BEV it signals behaving more environmentally responsible than others. On a collective level, feelings of collective pride which describe a celebratory emotion that takes place in groups may also play a role in understanding CPO (Harth 2013; Sullivan 2014). To what extent these feelings of collective pride emerge as a result of having feelings of CPO, particularly if those feelings centre around taking care of "our" environment by choosing to own a BEV warrants further investigation.

Overall based on the reviewed literature and knowledge gaps identified, the following three research questions are put forward to be addressed in this study:

- **Research Question 1** - What are the drivers that contribute to the development of PO at individual and collective level?

- **Research Question 2** - What are the consequences of feelings of individual and collective PO and how do these differ in BEV ownership?

  Research Question 3 - How might different feelings of pride impact the development and consequences of both individual and collective feelings of ownership in the context of BEV ownership?

The preceding chapter discusses the methodology used to answer these research questions presenting the research design and research paradigms adopted as well as the techniques used to collect analyse the data.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction to the Research

This chapter outlines and justifies the methodological approach used to collect and analyse the data in this study. Section 3.2 begins by offering the philosophical perspective and research paradigm and then describes comprehensively the epistemological, ontological, and axiological positions taken. In addition, it presents the rationale for adopting these approaches by addressing their relationship with the theoretical perspectives of this study. Sections 3.3 and 3.4 discuss the research design and methods underpinning the study by detailing the purpose of the research and the data collection techniques used. Section 3.5 and 3.6, describe in detail how a 2 phase (qualitative and quantitative) data collection process was conducted by following an exploratory sequential design. For each phase, the sampling procedure, fieldwork environment, analysis techniques used to interpret the data, and consideration of trustworthiness, rigour and validity in research are presented. Following this, chapter 3.7 offers the ethical considerations for this study. Finally, chapter 3.8 summaries the chapter by concluding with the methodological choices taken in this study.

To guide the discussion of the methodology chapter, figure 5 below illustrates a summary outline of this chapter to guide the discussions on theory development and the research methods adopted.

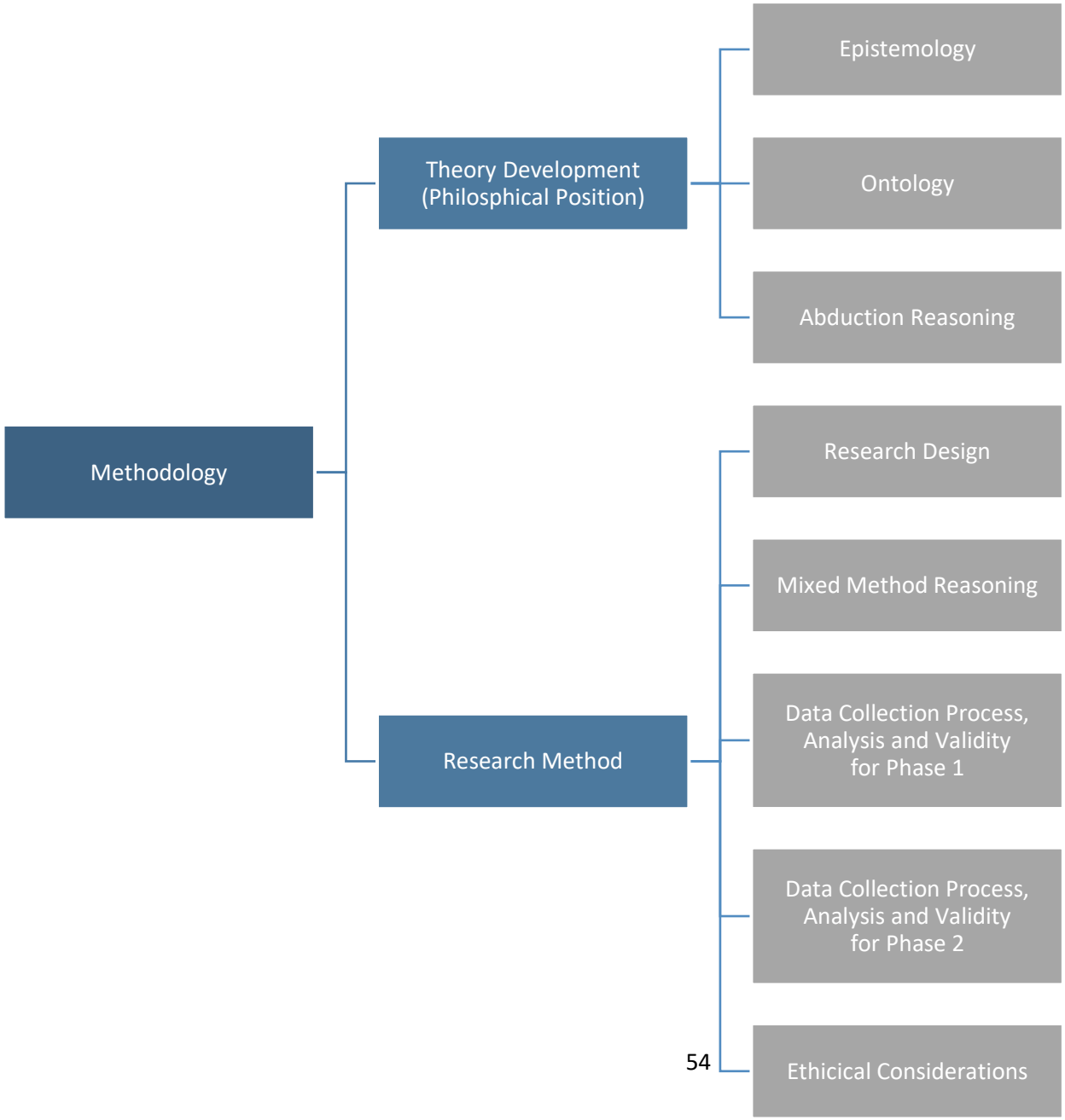


Figure *5* Overview of Chapter

3.2 Research Philosophy and Paradigm

For a researcher, the methodological approach and epistemological and ontological choices directly influence how the data and its findings are obtained (Cassell et al. 2018). Furthermore, it shapes the interpretation of data and how the findings are used to communicate the phenomena studied. Hence, it is logical to adopt a methodological approach that is underpinned by a 'philosophical paradigm' best suited to understand consumers' ownership feelings and shape the trajectory of the study. The philosophical paradigm can be described as a perspective based on a set of common belief assumptions and values directed towards understanding how problems should be solved (Acharyya and Bhattacharya 2020). On the other hand, research philosophy refers to the "system of beliefs and assumptions about the development of knowledge" (Saunders et al. 2015 p.124). Thus together, these assist the researcher in selecting the paradigm in which to conduct this study.

While multiple paradigms can be chosen to explain reality, each approach guides the research design differently (Marsden and Littler 1998). Saunders et al. (2015) describe the five major philosophies adopted across business and management research that are used to interrupt the social world. These include; positivism, critical realism, interpretivism, postmodernism, and pragmatism. Despite many paradigms existing, the two dominant approaches used by consumer research scholars are **Positivism** and **Interpretivism,** and are grounded in the following rudiments:

I. **Epistemology:** Refers to the relationship between the researcher and reality.
II. **Ontology:** Alludes to the assumptions of what is the nature of reality?
III. **Methodology:** Represents the specific techniques or methods used to investigate the phenomena.

To demonstrate how each of these rudiments are present in this study the following subsections outline them individually. As mentioned by Saunders et al. (2015), investigating the same social phenomenon may be approached from various philosophical perspectives, leading to different interpretations of the phenomenon. Consequently, it is vital that the

most suitable perspective is selected alongside the best-equipped methodology as this will maximise the understanding of the required knowledge.

3.2.1 Ontology

Ontology is often referred to as 'the science of being' which deals with the nature of reality and existence (Saunders et al. 2015). An interesting question put forward by Cohen et al. (2002 p.7) offers a thought-provoking predicament that best explains this: "Is social reality external to individuals – imposing itself on their consciousness from without – or is it the product of individual consciousness?". In other words, ontology alludes to what we believe is composed of social reality and whether this exists independently of our knowledge and how we view reality or, does the phenomena take place as a result of it. What we recognise as social reality can be categorised as either **subjectivism** or **objectivism** in the two ontological positions.

In essence, **subjectivism** incorporates the assumption that social reality is formed on the perceptions of social actors and deals with the *"*consequent actions of social actors" (Saunders et al. 2015, p.129-130). **Objectivism,** on the other hand, views social entities in the same way in which they view physical entities that being, their existence is isolated and independent of how we may perceive, think, or label them. Conversely, subjectivists back the opinion that there are multiple realities of existence, all of which are socially constructed. Regardless of the two ontological positions, the interactions and experiences exerted by social actors dictate what we deem reality (Collis and Hussey 2021). As argued by Saunders et al. (2015 p. 130) "social Interactions between actors are a continual process, social phenomena are in a constant state of flux and revision*".*

Based on these explanations, this study adopts a subjective ontological position because understanding and engaging in consumer research particularly consumer behaviour are heavily constructed by social realities (Fetters and Molina-Azorin 2017; Hair et al. 2020; Bryman et al. 2022). Furthermore, the manner in which individuals perceive and interreact with their possessions to form feelings of emotional attachment and proprietorship is complex and may not be understood thoroughly as a true reality (Belk 2018). Hence, acknowledging that each individual may hold a different perception towards a singular

entity (in this case, a BEV) presents various expectations that cannot be captured by holding the view that reality is external and tangible. Based on these ideas, a subjective view of the social reality was adopted.

3.2.2 Epistemology

Epistemology questions the manner in which we study a phenomenon, how this knowledge is obtained, and how we communicate this knowledge to others (Bryman et al. 2022). Furthermore, epistemology concerns what knowledge is regarded as valid and acceptable in the field of study. In other words, how do we understand what we know? Hence, to illustrate epistemology in a more coherent manner, it is useful to present and contrast the two most dominant and traditional research paradigms: **Positivism** and **Interpretivism** (Antwi and Hamza 2015; Fetters and Molina-Azorin 2017).

Positivism

This branch of philosophy fixates on its approach to pursuing the facts or causes of a social phenomenon and promises unambiguous and accurate knowledge. It is expected, however, that the researcher distances themselves from the object under study to avoid influencing the findings such that a precise and objective manner is in effect when investigating research problems (Collis and Hussey 2021). Positivists adopt a methodological approach that is data driven by statistics and numbers; thus, either a true or false outcome is expected in the findings with nothing in between. In essence, it can be said a positivist approach is accurate and absolute as the knowledge discovered is based on observant regularities in causal relations between elements.

Interestingly, positivism was founded on the idea that research examining human behaviour should be approached in the same fashion as that seen in natural science whereby social reality is deemed independent and continues to exist irrespective of whether we notice its presence or not. Hence ontologically, positivists converse with the notion that reality is external (Saunders et al. 2015). For this reason, this paradigm assumes a deductive approach whereby theories shape the data collection process and lead to a scenario that either accepts or reject a hypothesis (Bryman et al. 2019). Hence, a quantitative research

approach is a suitable approach, as it allows the researcher to be independent of the phenomenon (Saunders et al. 2015).

While a positivist approach may come across as a perfectly valid and promising principle in certain research fields, it is not flawless. As the world we live in today is complex, uncovering the subjective meanings of the phenomenon requires a deeper, more detailed approach to uncover new knowledge. Hence the other paradigm on the spectrum, **interpretivism** challenges the views adopted by positivist and seeks to address the flaws perceived when adopting a positivist standpoint in social science research.

Interpretivism

Interpretivism emerged in the 19th century to question the radical quantitative stance shared by positivists by posing a qualitative approach to examine reality (Bryman et al 2022). As noted by Thompson et al. (2013 p. 155) interpretivism is a "humanistic/ experientialist approach that expresses consumers as emotional, creative, and inner-directed individuals who sought self-actualising experiences." This viewpoint fits this study's objectives, as it suggests that consumers should be seen as a primary unit of analysis, each with a unique background to uncover.

Interpretivism embraces a subjective ontological standpoint and deals with understanding the various feelings and opinions of humans (or social actors) in response to a phenomenon being studied (Bryman et al. 2022). Interestingly, because of the nature of understanding society from a social perspective, several authors label this paradigm as 'social constructionism' as phenomena that take place across societies are believed to be socially constructed by humans (Downes 2013; Henrich 2011). For this reason, interpretivist suggests there are multiple realities, all of which evolve over time, given that we as humans are exposed to multiple historical, cultural and contextual changes in our lifetimes (Cassell et al. 2018; Crotty 2020). This view of multiple realities contrasts with the view of positivists where by one reality is believed to exist and experienced objectively. This echoes the observation made by Saunders et al. (2015 p. 139) who notes given the complexity of the social world "interpretivists are critical of the positivist attempts to discover definite, universal 'laws' that apply to everybody. Rather, they believe that rich insights into

humanity are lost if such complexity is reduced entirely to a series of law-like generalisations". From this, it is clear that interpretivists immerse themselves in engaging with social actors to present an in-depth insight into individual meanings and motives by allowing social actors to present their 'story' which drive the research findings (Antwi and Hamza 2015; Alharahsheh and Pius 2020). Thus, it can be said the data that emerges is neither detected nor created but instead co-produced, and in doing so expresses the interactions between the researcher and the participants of the study (Cassell et al. 2018). Therefore, this process follows an inductive approach whereby a theory is presented based on the observations made from the data and 'getting a feel of what is going on' (Saunders et al. 2015). Consequently, because of the interactive nature of this approach, interpretivism adopts qualitative research methods to collect data by deploying various techniques, such as in-depth interviews, focus groups and ethnography (Saunders et al. 2015; Bryman et al. 2022).

Indeed, the interpretivism paradigm seems the most appropriate philosophical approach to explore BEV ownership feelings, particularly using the lens of PO. However, research methods that belong in the realms of interpretivism do not constitute a causal relationship, one which can be used to generalise findings to represent a wider group of BEVs owners or potential owners. Hence, it would be beneficial to engage in multiple philosophical approaches to present new knowledge. The following section presents the preferred philosophical approach adopted in this study, pragmatism, which sits between positivism and interpretivism.

Pragmatism

Pragmatism aims to capture a subjective and objective, in which the reality in question is seen as constantly renegotiated, examined, and interpreted (Saunders et al. 2015). This paradigm aligns with my philosophical view of the world. Pragmatism aims to reconcile different contextualised experiences and facts and values to emphasise practical solutions and outcomes. Hence, the focus shifts away from methods seen in positivism and interpretivism, and instead directs its attention to problem solving by employing the viable approaches present (Simpson 2018). Moreover, pragmatism is believed to be a flexible philosophical stance given it does not commit to a singular system of philosophy and reality

(Bryman and Bell 2015). This allows the theories, hypothesis, and research findings to be seen non-abstractly but rather considered as instruments of thoughts and action (Saunders et al. 2015). Therefore, pragmatism therefore welcomes the notion that ideas, opinions and views may change over time in a social construct and are therefore seen as a process of renegotiation and underpinned by the belief that theories and knowledge permit successful actions while focusing on real consequences. Hence, knowledge discovery is not centred on a theoretical relationship between the known and knower. Rather, it is discovered through a series of inquiries that enables a process of confabulation between actions and beliefs (Acharyya and Bhattacharya 2020).

With reference to the research methods that guide this approach, pragmatists consider that there are multiple ways in which we may interrupt society with no singular and definitive means of capturing the entire picture (Cresswell et al. 2018). Despite this, pragmatism does not signify the application of multiple methods, but instead utilise methods which can enhance credibility and reliability to collect data that not only offers new knowledge but also advances research (Willis 2007). Hence, a range of qualitative and quantitative methods may be used in one study signalling a mixed-methods approach. Thus, rather than adopting a deductive approach that moves from theory to data or an inductive approach that mirrors this by moving from data to theory, pragmatism embraces an abductive approach that offers a unique balance between the two. Saunders et al. (2015 p.152) explains, *"*with abduction, data is used to explore a phenomenon, identify themes and explain patterns, to generate a new or modify an existing theory which is subsequently tested, often through additional data collection". Consequently, this study adopts an abductive approach that enables it to explore the phenomena while situating between empirical observations and theory.

3.3 Justification for the Chosen Research Paradigm - Pragmatism

To conclude the discussions regarding research paradigm and philosophies, the ontological stance adopted in this study is subjective and is supported by adopting a pragmatic epistemological viewpoint. The selection of pragmatism is encouraged as the study explores a social phenomenon concerning ownership feelings of a new product which is not widely

adopted yet (Fevang et al. 2021). Thus, obtaining wide spread of data is useful to provide a holistic conclusion. Given that consumer behaviour is such a challenging and complex phenomena to investigate, placing the research either side of the research paradigm spectrum is argued to be the most effective approach to generate new knowledge (Davies et al. 2015; Majeed 2019). With that being said, employing a qualitative and quantitative research design first allows the study to unpack social patterns and attain undiscovered knowledge on ownership feelings particularly in the theory of PO. This allows the second phase to take place, theory testing, to predict and measure the casual relations to reliably capture the whole picture of the emerging phenomenon. Hence, this study adopts the traditions in abductive reasoning as it allows the qualities of both inductive and deductive approaches to be used. This decision was inspired by the discussions of Saunders et al. (2015) who noted if conducting research where a wealth of literature has been documented about one context, but the volume of literature is little in the context being explored, favouring an abductive approach is more effective as it enables for existing theories to be adapted. Although several studies focusing on PO in consumer behaviour have been approached quantitatively (Brasel and Gips 2014; Shu and Peck 2018; Smith et al. 2022), there is a lack of studies approached qualitatively particularly in the field of sustainable transport including BEV. Thus, this study contributes to this gap literature and knowledge gaining by adopting a qualitative approach to investigate PO.

As car ownership tends to be a unique experience between the owner on the car, the owner actively constructs memories, personal meanings and emotional attachment towards their car that shaping the overall experience and interaction with it (Dittmar 1992; Steg 2005). Thus, there is a need to understand how these feelings emerge and manifest to examine this phenomenon precisely. As argued by Watkins (2015) and Dawkins et al. (2017) beyond employing a quantitative approach, to dive deep into the psychological experiences an individual has towards a possession particularly through the lens of PO collecting data qualitatively is advantageous. Moreover, given one of the primary objectives of the study is to observe how emotion (pride) takes place in the development of PO, observing this in-depth with existing BEV owners bridges the gap in knowledge. Consequently, using qualitative data can further the researchers understanding to develop constructs and clarify the variables when developing the hypothesis to be tested quantitively.

This chapter proceeds by justifying and describing the research context for the study prior to reviewing the stages taken to conduct each method individually.

3.4 Research Design – Mixed Methods

Employing a clear and purposeful research design is fundamental to a research project as it demonstrates "the plan and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis" (Creswell 2014 p.5). This section outlines and explains the methods used to conduct this research. There are three methods of conducting consumer research as described by; (Creswell 2014; Saunders et al. 2015; Bryman et al. 2022); quantitative, qualitative and mixed methods which are briefly reviewed below.

Qualitative

Designed to capture the underlying explanations of human behaviour, qualitative research is designed to "'produce findings not arrived at by means of statistical procedures or other means of quantifications" (Corbin and Strauss 2008 p.18). In other words, this approach relies on using worded answered and extended pieces of text to examine a phenomenon, as opposed to interpreting and concluding the data by means of understanding quantifiable metrics and statistics. Hence, the collected data is examined inductively, resulting in various broad themes to explain the meaning and significance of the data, allowing the researcher to present a theory to best explain the cause and meaning of the relationships being observed (Creswell 2014). Techniques such as focus groups, interviews and document analysis are some of the ways in which qualitative researchers explore a phenomenon. As a result, the sample size of participants is much less than that seen in quantitative studies (Silverman 2016).

Quantitative

On the other hand, Quantitative research as described by Bryman and Bell (2015 p.95) focuses on "quantification in the collection and analysis of data". In essence, quantitative research tests the relationship between a set of observed variables using one but often usually more statistical techniques (Bryman et al. 2022). Therefore, the aim of the analysis is

to verify or falsify the proposed hypotheses that emerge from theories (Creswell 2014). Scholars who use quantitative techniques in their research often hold the view of positivists, where they believe that the researcher should be positioned externally to the reality under consideration (Bryman et al. 2019). One key aspect of quantitative methods is the ability to aid the researcher in offering a prediction about a phenomenon with a general assumption and conclusion about the dataset. Generally, this is welcomed by a greater sense of reliability given the large size of the sample that is collected in comparison to that seen in qualitative studies. Techniques such as correlation research or surveys are among the most used methods in quantitative studies where a large sample size is collected (usually 100 or more), which is designed to collect measurable data to formulate facts and uncover patterns in research (Creswell 2014).

Mixed Methods

A combination of quantitative and qualitative methods has gained significant attention in academic research. This approach compromises the use of least one qualitative and one qualitative method in the same study to answer the research objectives (Creswell 2014; Fetters and Molina-Azorin 2017). This approach enables a study to yield a stronger understanding of the subject by offering an explanation by numbers (e.g. statistical measures) and words (e.g. interview quotes) (Tashakkori and Teddlie 2010). Thus, it is reasonable to suggest adopting a mixed-methods approach addresses the weakness between qualitative and qualitative methods resulting in a rigid integration to offer knowledge that might otherwise be unobtainable through one method alone (Bryman et al. 2022). In other words, because the research is not limited to using one method, a wider range of research questions can be investigated.

The aim of this study extends beyond identifying whether individuals have feelings of ownership, but also investigates the motives for achieving this, as well as its outcomes. Consequently, the challenging aspect of conducting a study of this nature is the ability to obtain credible data that not only clarifies but also explains the development of these feelings. Therefore, to generate knowledge that is intended to elaborate on the development of the theory of PO and offer new information on BEV ownership feelings, a

combination of qualitative and quantitative methods is used in the study. Subsequently, this research design was exploratory, as discussed in the forthcoming sessions.

3.4.1 Exploratory Sequential Design

Scholars debating mixed method research designs often discussed advantages and disadvantages of each (Greene and Caracelli 1997; Edmonds and Kennedy 2017; Fetters and Molina-Azorin 2017; Bryman et al. 2022) which are summarised briefly in Table 3.1.

Table 3.1 Three Types of Research Design

Research Design	Key Features
Explanatory Research	Employs quantitative methods initially followed by using qualitative enquiry to explain results in further detail.
Exploratory Research	Uses the results derived from qualitative enquiry to drive the constructs, variables and hypothesis which are tested quantitatively.
Convergent Parallel Research	Adopts an independent but simultaneous data collection of both qualitative and quantitative. Following analysis results are discussed together to offer holistic explanation and understanding of phenomena.

Adapted from Edmonds and Kennedy (2017)

This study adopted an exploratory sequential research design using a two-phase data collection approach. Accordingly, the first phase focuses on collecting qualitative data to further understand PO and feelings of pride in BEV ownership. In doing so, this acknowledges the underdeveloped understanding of PO, particularly in consumer research and sustainable behaviours (Süssenbach and Kamleitner 2018). As a result, the qualitative phase seeks to discover new knowledge and enlighten the understanding of ownership feelings particularly in conjunction with feelings of pride. Moreover, since qualitative research generally consists of a smaller sample size than quantitative research (Saunders et al. 2016), a more in-depth approach can be taken to yield a comprehensive understanding. Following this, the results of the qualitative phase (Phase one) aid in developing and

conducting Phase two of the data collection (the quantitative component), which seeks to clarify the variables and hypotheses proposed based on the qualitative findings and prior literature. Hence, the results from phase one builds on the knowledge attained from the literature to present a theoretical framework to test a series of hypotheses to identify a link between the observed variables (Fetters and Molina-Azorin 2017; Bryman et al. 2019). Consequently, this study is exploratory in nature, using abductive reasoning to engage back-and-forth between data and theory to identify new information and patterns. Although some scholars argue that an exploratory research design is challenging and time-consuming (Cameron 2009; Edmonds and Kennedy 2017), it is relatively straightforward in explaining, conducting and reporting.

Furthermore, the qualitative component serves as an opportunity to expand on the propositions and theories drawn from the literature, given that exploring BEV ownership feelings is an underdeveloped subject area. The specific techniques adopted in the qualitative and quantitative phase of this study are presented in the subsequent subsections in chapters 3.4 and 3.5 respectively.

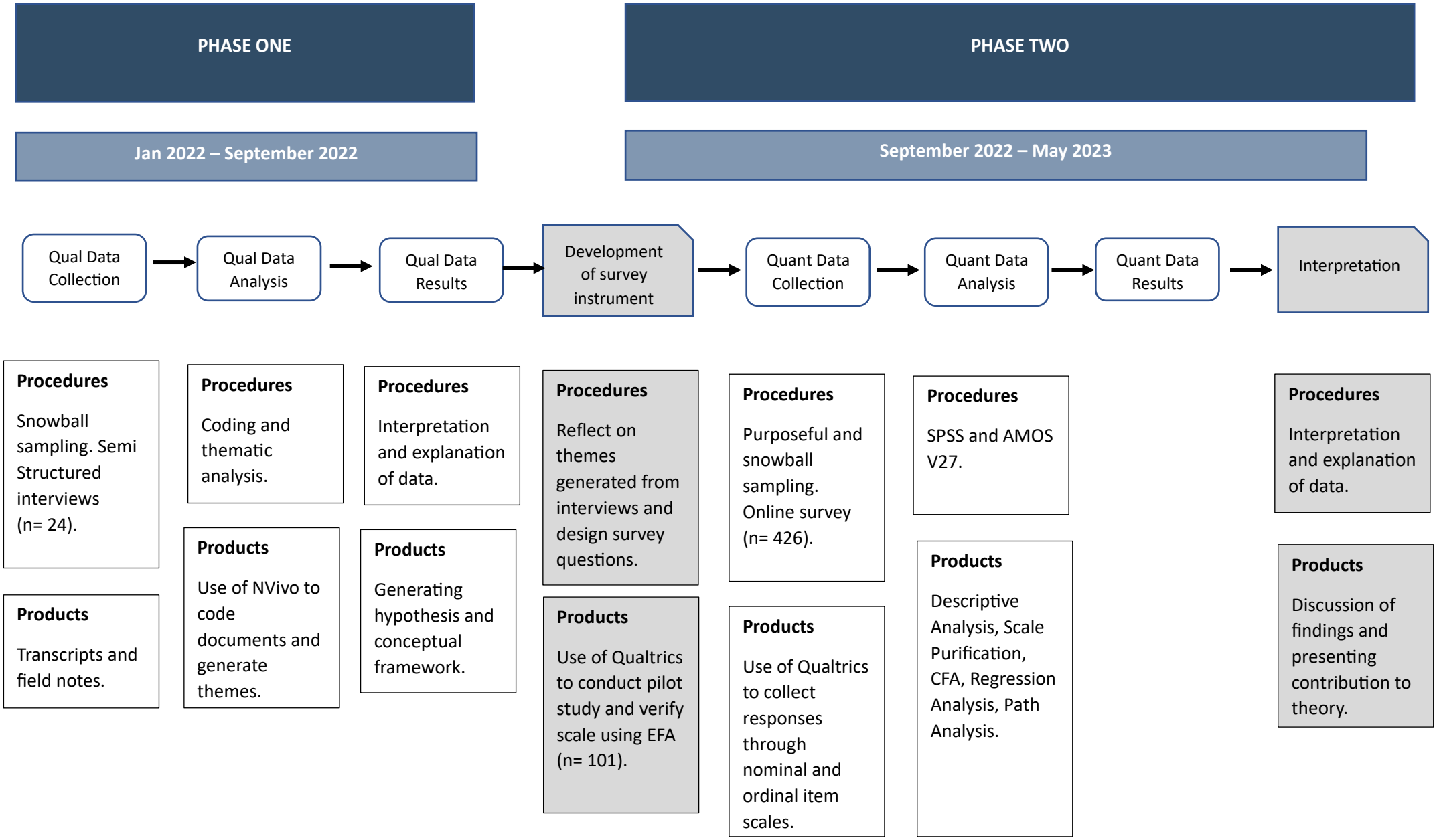


Figure 6 Overview of Phase one and Phase two

Source: This study

3.5 Phase One of Data Collection (Qualitative Phase – Interviews)

This section describes the stages taken in the qualitative phase of the study. It highlights how the interview guide was developed, as well as the recruitment and sampling techniques used. Additionally, it outlines the strategy and process used to code and analyse the data.

3.5.1 Semi-structured In-depth Interviews

There are multiple techniques to collect data in qualitative research. In consumer behaviour research, the most widely used methods are focus groups and interviews (structured, semi-structured or unstructured) and ethnography (Silverman et al. 2016). This study used semi-structured in-depth interviews as its chosen research method. Although focus groups were considered, interviews offer a more effective technique to stimulate participants to express their opinions, experiences and feelings to create an in-depth discussion of a phenomenon (Creswell 2014; Bryman et al. 2022). Moreover, semi-structured interviews can be thought of as a 'conversation with purpose' between the researcher and participants which discusses a set of pre-planned and impromptu open-ended questions (Silverman 2016). On another note, interviews were favoured as they provided data using worded answered and extended pieces of text to describe a phenomenon as opposed to interpreting and concluding data using quantifiable metrics and statistics.

Consequently, semi-structured interviews were selected as its facilities a direct interaction between the researcher and participants to engage in an in-depth dialogue. This provided an opportunity to observe the interpretations of participants experiences and feelings while owning a BEV. Additionally, since participants were encouraged to reflect on their ownership experience and the route leading to owning a BEV, self-reflexivity was encouraged to attain a holistic but deep understanding of their ownership behaviour. Table 3.2 offers a summary of the stages taken to conduct the interviews:

Table 3.2 Qualitative Phase Stages				
Stages	**Method**	**Description**	**Sample Size**	**Year**
Ethics approval attained January 2022 emphasising interviews take place online due to Covid-19 Pandemic.				
1)	Interviews with marketing practitioners to aid the development of the interview guide to be used with BEV owners.	Semi-structured in-depth interviews with marketing practitioners from leading BEV manufactures, Consultancies and Academics.	8 participants	Jan 2022 - February 2022
Interview Guide for BEV owners revised following discussions and advice from interviewing practitioners				
2)	Interviews with existing BEV owners in Wales.	Semi-structured in-depth interviews held online question participants about their BEV ownership behaviour drawing on themes of PO and feelings of attachment.	24 participants	4 months between: February 2022 – May 2022
3) Transcription of the interviews.				
4) Organisation of the data using NVivo 11 software.				
5) Manual thematic analysis.				

3.5.2 Interview Guide

A discussion guide was created to facilitate the interviews and to explore the themes of the study in an exploratory manner. The discussion guide (see Appendix B) was developed based on eight interviews that took place with marketing practitioners as well as the knowledge gained from the literature.

The purpose of conducting interviews with marketing practitioners was twofold. (1) Firstly, participants were asked to offer their viewpoint on the current position of the BEV industry in the UK and its future goals to achieve electrified driving. Questions such as 'what more needs to be done to enhance the BEV market?' and 'What do you feel are some of the biggest challenges faced by consumers when seeking to own a BEV?'. This allowed me to extend my knowledge of the development and the future of the BEV industry beyond what was gained from the literature to enhance my understanding of the subject and design

suitable interview questions. (2) Second, the marketing practitioners were asked to share their opinions and understanding of consumers attachment feelings towards their car and the impact this has on the overall ownership experience. This allowed for the various subject themes namely PO and feelings of pride to be introduced and discussed which prompted questions such as; 'What have you learnt from consumers about how the feel psychologically towards their car?' 'How important do you think car pride is particularly with BEVs where there are many aspects to be proud of like being environmentally friendly? Overall, the participants responded positively to the aims of the study and the expected outcomes. More importantly the data collected from these interviews offered rigidity and robustness for the interview guide that was later created and aimed at current BEV owners.

Following this, the interview guide for current BEV owners was created and comprised of three sections (see Appendix B). In the first part of the interview, the participants were asked to talk about their background and share information on where they live in Wales, how long they had been driving a BEV and roughly how many miles they drive each week to understand the time spend with their car. For example, questions such as, 'Tell me a bit about your background, where you are from and what you do for a living?' were used. The interview proceeded to ask participants what their motives were for deciding to own a BEV. This not only helped validate previous studies that draw on reasons to own a car, but also make participants feel comfortable about talking about their BEV. For instance, participants were asked 'Can you tell me why you decided to own a BEV and for how long have you had one?'

The interview continued by questioning the respondents on their ownership experience with their BEV. To begin with questions such as 'What are things you like and don't like about your car?' and 'Can you tell me about your experiences of owning one so far'? was used to ease the participants into discussions that would lead to PO and feelings of pride. Following this, participants were asked to share whether they had grown to feel attached to the car and if so, why? Participants were prompted to reflect on the whether they felt a degree of PO towards their car which allowed the discussion to facilitate further and more interesting conversations talking about what makes them feel the car is "mine". Following this, participants were presented with a series of questions which were intended to identify

whether participants felt connected psychologically to other BEV owners. Questions such as 'Does owning a BEV make you feel part of a wider community who also own a BEV? And 'Do you feel you and other BEV owners represent a wider community of environmentally responsible individuals?' were put forward. Finally, the topic of car pride was introduced, and participants were asked to respond to what made them feel proud (if any) about owning a BEV. Initial questions such as "Do you feel proud of your car'? "were promoted before diving deeper and asking "when driving your car do you feel a sense of achievement why might this be the case?"

Although the interviews were conducted using a guide, further relevant tangential lines of inquiry during the interview were also explored. For instance, some participants mentioned how often they spoke about their cars to others particularly those looking to own a BEV. This prompted me to ask if engaging in word-of-mouth communication was gained because of the sense of pride gain from owning a BEV.

Given the various topics and terms used in this interview, the questions were worded in a manner that kept participants interested and refreshed. For this reason laymen terms and simplified vocabulary were used where it was possible to avoid 'vocabulary problems' which may stem from background differences in education and regions (Creswell 2014). Adopting this approach helped ensure that questions were framed In an encouraging and welcoming manner to allow participants to respond freely and express their thoughts adding to the overall quality of the data (Myers 2019).

Overall, it can be said the guide served the purpose of ensuring the core questions and topics that needed to be discussed were done so, allowing the interview to stay on topic that also offering participants the scope to expand on their answers when desired. Prompts and probing questions were also used during the interviews allowing for a better understanding of their answers.

3.5.3 Interview Procedure

Both sets of interviews (those involving BEV owners and marketing practitioners) adopted an in-depth semi-structured interview style lasting roughly 55-90 minutes each subject to the participants' willingness to talk. While attempts were made for the interviews to be held

face-to-face, this was possible because of the COVID-19 pandemic and regulations set by the University Ethics Committee. Thus, to ensure safety between myself and the participants the interviews were all held online using Microsoft Teams, which was chosen for its high levels of security and ease of use. To maximise and enhance the accuracy of the discussions made during the interview, all interviews were audio recorded using Microsoft Teams software as such, no external audio recording device was used. The interviews were transcribed using NVivo with the consent of the participants (Bryman et al. 2019; Jackson 2019). Where participants did not consent to audio recording, detailed notes were taken and used as evidence for discussion.

Consent from the participants was obtained before the interviews as well as reminded prior to commencing the interview that their participation was voluntary (Creswell 2014; Myers 2019). Moreover, to aid in more open discussion and encourage participants to speak freely, anonymity was guaranteed when participants were informed that a pseudonym name would be used when discussing the data throughout this thesis (Edmonds and Kennedy 2017). In addition to a guide being used to guide the discussions, several prompts were used to follow up in order to encourage elaboration and clarity. Prompts such as 'What did you mean by that?', 'Am I right in saying that…?' and 'Can you share a little bit more about how…?' was used to encourage participants to offer a rich and descriptive accounts.

The questions in the interview guide were designed in a fashion that began with simpler questions and transitioned towards more complex ones to reveal the participants' own experiences as opposed to the participants talking about the experiences of other individuals. Throughout the interview, the researcher strived to achieve a welcoming and relaxed relationship to gain a high degree of trust between the researcher and the participants encouraging them to express their opinions and responses freely. Finally, the interviews were conducted in a 'non directive' style by asking open-ended questions with a neutral tone of voice to reduce the risk of interview bias (Salmon et al. 2012).

3.5.4 Recruitment Process and Sampling

Recruitment Process

The strategy adopted to recruit participants for the study was instrumental as to maximise diversity to ensure there was diverse differences between participants to capture various viewpoints to offer a holistic understanding. Sampling is said to play a key role in the research process as the selection of participants is vital in leading to the findings of the study (Saunders et al. 2016). Participants were selected based on several simple strategies. As noted by Silverman (2016) and Bryman et al. (2019), non-probability sampling is best suited for qualitative research as it is driven by interpretivist epistemological viewpoints (the pragmatic part of the study). In addition to this, subjective judgement was also used to identify participants to yield the relevant knowledge and information about the subject of the study (Corbin and Strauss 2008; Myers 2019). Therefore, for both sets of interviews (those with marketing practitioners and current BEV owners), self-selection sampling and snowball sampling techniques were used to recruit and capture a range of participants for the study.

For the interviews with marketing practitioners, self-selection sampling was used, to interview individuals from various marketing positions. Hence, the decision was made to recruit; insight managers from car manufacturers, automotive consultants; academics that contribute to BEV research and Welsh Government representatives. These individuals were sourced and contacted using LinkedIn as well as my contacts and personal networks within the automotive industry and academia. Subsequently, participants were recruited based on their job title and duties as well as the number of years of experience such that each participant had at least five years of work experience concerning BEVs and held a background in consumer insight. Following the conclusion of each interview, snowball sampling was used to prompt participants to ask other individuals who would be deemed suitable for the study to get in contact with myself. The purpose was to take advantage of social connections formed and reach a wider selection of participants. It is important to note however, this recruitment technique may be biased given that individuals may have contacted a specific group such as close colleagues (Creswell 2014). All participants used in the interview were initially contacted via email in which the details of the study were

shared, and consent was requested by the participants prior to arranging an interview date an overview of the demographic profile of these individuals is presented table 3.3:

Table 3.3 Summary of Participants – Marketing Practitioners

Interview Number	Pseudonym Name	Place of Work	Position	Years of Experience
1	Henry	Deloitte	Consumer Insight Consultant in Automotive Industry	12 Years
2	Thomas	SMMT	Senior Consultant in Sustainable Mobility	20 Years
3	Kevin	Jaguar	Brand Experience and Lifestyle Marketing Lead	9 Years
4	Amy	Kia	Consumer Insight Manager	7 Years
5	Lee	Volkswagen	Product Manager	17 Years
6	Richard	University of California, USA	Researcher in Plug-in Hybrid & Electric Vehicle Adoption	10 Years
7	Lewis	Cardiff University	Researcher at the Centre for Automotive Industry Research	15 years
8	Andrew	Welsh Government	Senior Programme Manager for Various Decarbonisation and Sustainability Projects	14 Years

For the interviews held with BEV owners in Wales, the same sampling techniques, self-selection, and snowballing sampling were also used. It is important to note participants were only recruited if their car was classed in the category of Battery Electric Vehicle (BEV) and not other EV types such as Plug-in Hybrid Vehicle (PHEV) or Hybrid Vehicle (HEV). First, potential participants from the researcher's social network were identified and approached. From this, seven participants were interviewed. However, given these individuals were mostly situated in South Wales, it was recognised this may have created a bias, as the study concerns the whole of Wales. To overcome this hurdle, select sampling technique was also adopted by joining various social media groups that specifically target BEV owners in Wales. Here, group members were made aware of the study and a call for participants to take part

by detailing the study's objectives, their expected involvement and emphasising anonymity. Finally, individuals who were charging their car at public charge points were approached and introduced the study to recruit potential participants. By following these sampling approaches, BEV owners across all of Wales were recruited, thus minimising the risk of location bias.

Having said this, Antwi and Hamza (2015), Edmonds and Kennedy (2017) and Jackson (2019) note, irrespective of the recruitment strategy used, challenges with recruitment and sampling size may still arise. Since this research was conducted during the COVID-19 pandemic, recruitment challenges were faced particularly with social distancing regulations and various lockdown laws, which forced potential participants to agree that the interview was to be held online as opposed to the desired face-to-face method. It is possible that some potential participants declined taking part in the study, given they were to be held online and did not wish to spend more time online than they already had. Finally, the impact of the COVID-19 pandemic on the automotive industry has in a shortage of semiconductors, a key component used to produce BEV (Ramani et al. 2022). Therefore, limitations in the recruitment stage was made apparent, as arguably fewer individuals had opportunities to own and experience a BEV during the pandemic, thus impeding recruitment potential.

Sample Size

Various scholars note there is no 'correct' number of sample size needed for interviews but rather a sample size between 20 to 30 participants should be considered appropriate for yielding relevant knowledge needed (Creswell 2014; Silverman 2016; Bryman et al. 2019; Myers 2019). It is worth noting that the sample sizes and qualitative research differ significantly from those used in qualitative research. Given the overall purpose of qualitative research is to understand the phenomenon in detail as opposed to generalising findings as part of a wider population, there was an emphasis placed on the quality and richness of the data rather than the sample size. Having said this, the sample size in the study consisted of 24 participants all of whom owned a BEV and lived in Wales. This sample size was in line with other consumer behaviour studies concerning BEV as demonstrated by (Pedrosa and Nobre 2019; Magnani and Re 2020; Chhikara et al. 2021) where each study consisted of 20, 23, and 25 participants respectively. Thus, a sample size of 24 for this study was deemed to

be sufficient for this study. Irrespective of this, interviews were held until theoretical saturation was attained where no further knowledge was gained, which signalled the conclusion of the data collection phase. Overall, the interviews lasted between 55 minutes and 92 minutes, offering 28 hours of interview material. Table 3.4 offers a summary of the participants recircuited for the interviews involving BEV owners.

Table 3.4 Summary of Participants – BEV Owners

Interview Number	Pseudonym Name	Gender	Interview Time
1	Ahmad	Male	63 Minutes
2	Hussain	Male	61 Minutes
3	Stuart	Male	58 Minutes
4	Bethan	Female	88 Minutes
5	Daniel	Male	71 Minutes
6	Jason	Male	64 Minutes
7	Alex	Male	82 Minutes
8	Karen	Female	81 Minutes
9	James	Male	64 minutes
10	Malcom	Male	76 Minutes
11	Stephan	Male	72 minutes
12	Phoebe	Female	55 minutes
13	David	Male	92 minutes
14	Michael	Male	82 minutes
15	Malik	Male	85 Minutes
16	Joseph	Female	74 minutes
17	Yousef	Male	60 minutes
18	Khalid	Female	55 minutes
19	Sarah	Female	62 minutes
20	Megan	Female	68 minutes
21	Rebecca	Female	56 minutes
22	Jack	Male	65 minutes
23	Emma	Male	57 minutes
24	Christopher	Male	67 minutes

3.5.5 Trustworthiness and Rigour in Research

The measures taken to maximise credibility centred around the parameters set for the; methodology, data collection process and preferred analysis technique which needed to be well defined and rigorous to ensure the research findings are accepted by scholars and practitioners. For qualitative research, trustworthiness was used to measure the credibility of the study (Cassell et al. 2018). Furthermore, Cassell et al. (2018) notes when conducting qualitative research, trustworthiness is achieved by fulfilling the following four criteria's; transferability, credibility, conformity and dependability. The steps taken to achieve these four criteria's are as follows:

Transferability

This denotes the degree to which the findings can be transferred and applied to other contexts. In the case of this study, the idea of generalising the research findings is not directly applicable, given the purpose was to understand ownership feelings in a specific context and offer a detailed description of the findings. Hence, the research objective and its methodology may be applied to other contexts. For example, future research may choose to examine feelings of ownership of e-bikes or e-scooters given they both draw comparisons with BEVs (personal electrified transport). Moreover, it is rational to suggest the context of this research may be applied to other similar sized countries by population such as New Zealand, given the similarities in the government proposal to transition towards sustainable transport (Broadbent et al. 2021).

Credibility

Credibility questions whether the representation and response shared by the participants accurately reflect what the participants intended (Saunders et al. 2015). These criteria are achievable including replication of the findings, consideration of rival explanations and showing how a clear correlation exists between the research findings and reality (Saunders et al. 2015). Accordingly, this research aimed to achieve a high degree of credibility by conducting interviews with multiple participants who are already immersed and experienced in BEVs, that is, existing BEV owners and marketing practitioners in the BEV industry. This allowed me to gain a holistic view from two distinct perspectives regarding

BEV ownership, thus allowing me to attain rich quality data and assess the evidence accordingly. Furthermore, prior to conducting the interviews with BEV owners, a pilot study involving three participants was conducted to ensure feasibility, test the research guide, and make changes to the questions if necessary (Bryman et al. 2022).

With regard to analysis, the 'Member-check' technique as described by Thomas (2017) was adopted where by preliminary analysis in the form of asking some of the interview participants if the researchers' interpretation of their responses was accurate. This technique allowed me to maintain a consistent interaction with the participants and gather their opinions on the transcription of their interviews in addition to seeking feedback on the interpretation of the data such that an accurate representation of their responses and experiences was documented. However, it should be noted that one drawback of this technique, particularly with individuals who assume a high profile, is the potential challenges in accessing desired information, as well as the participants willingness to share (Myers 2019).

Reliability and Dependability

Reliability describes when other researchers follow and repeat the methodological processes taken and, in doing so, achieve a similar results (Nowell et al. 2017). Moreover, a research is said to be dependable when "complete records are kept of all phases of the research process...in an accessible manner" (Bryman and Bell 2015 p.403). Hence, to emphasise dependability in this study, the data analysis stages were documented and presented using a step-by-step guide on the process taken to achieve the qualitative data. Furthermore, given that the data and relevant documents involving interviews were analysed using NVivo 12, replication of the steps taken is clear and straightforward. Finally, throughout the data collection process the research objectives and aims were reviewed and discussed with the research supervisory team to improve the reliability, rigour and trustworthiness of the data collection process.

3.5.6 Method of Analysing Qualitative Data

The findings of the 24 interviews conducted were analysed using computer-assisted qualitative analysis software (CAQDAS) alongside the use of manual data analysis

techniques. Consequently, NVivo version 12 was used in this study to code and analyse the data thematically (Zamawe 2015; Jackson 2019). In line with other qualitative studies investigating BEV ownership, NVivo is commonly used to analyse qualitative data (Magnani and Re 2020; Chhikara et al. 2021), therefore NVivo was deemed to be suitable for use in this study. Creswell (2014) suggests how NVivo can be used to facilitate thematic analysis enabling the researcher to identify the many feelings and opinions expressed by the participants of a social phenomenon and labelling these using various 'themes'. In light of this, NVivo was used to arrange and categorise the data to develop common themes that can explain the participants insights. Zamawe (2015) noted that one key benefit of using CAQDAS is the avoidance of the manual process of organising data, thus allowing the researcher to allocate more time to identify and develop conclusions. The following sections elaborate on the analytical tools used to understand the data as well as the process taken to create themes that were developed from the data. The overall process adopted to analyse the in-depth interviews was carried out using the systematic procedures suggested by Braun and Clarke (2006).

Table 3.5 Steps Taken to Identifying Themes
1) Familiarising with the data – reviewing interview transcripts writing down initial thoughts and creating tentative categories.
2) Generating initial codes – identifying discrete excerpts of the data that is deemed interesting and meaningful.
3) Revising the set themes created and deciding whether to keep them or combine several themes together.
4) Creation of a map of the data with final set of themes.
5) Discussion of themes and emerging data in findings chapter.

3.5.6.1 Familiarity with the Data (Step 1)

As reported by Cresswell et al. (2018) It is necessary to engage with the data to develop a strong level of familiarity with all areas of information. In other words, the data was reviewed, such that the content was screened by depth and breadth (Cresswell et al. 2018). Thus, by repeatedly reading the data, the researcher was able to actively seek out meanings

and patterns to ensure the researcher was immersed in the data to develop familiarity. While this process may be seen as time consuming given the depth of reading needed, it did echo the reasons why sample sizes in qualitative research are generally smaller than those seen in quantitative research. First, the audio files were transcribed, which allowed me to gain a continuous read, and develop a thorough understanding of the data, and reduce the risk of inaccuracy of the transcript when checking against the recording (Bryman et al. 2019). The interviews were transcribed verbatim using NVivo following each interview. During the transcription process notes were made on any initial thoughts and meaningful information attained, which were later revisited when creating initial codes. Subsequently, a master document was produced that contained a summary of the patterns and meaningful responses from the data. This helped to facilitate for the initial coding process and developing themes to summaries the key parts of the data.

3.5.6.2 Initial Code (Step 2)

This phase involved producing initial codes of the data. Following transcription of the interviews, each transcription was reviewed to identify common patterns assigning codes to label this. Gibbs and Flick (2018 p. 63) describes those codes used to "define what the data you are analysing are about". Hence, codes tend to show a basic element of the raw data that appears to be interesting and relevant to the study stemming from the questions asked. The labels for the codes were decided based on how often issues or keywords were repeated across the interviews and their similarity to what was observed in the literature. Overall, codes were developed from the data itself as well as pondering on codes used in similar studies to ensure theoretical relevance (Watkins 2015; Chhikara et al. 2021). Thus, in line with other researchers, an inductive approach was adopted to interpret the data.

Once codes were assigned to the data from all transcripts, codes were grouped that were associated with the same issue to form themes that represent a broader summary of what the information entails. It is important to note the codes developed from the data and not by having pre-existing assumptions or conceptualisations. This ensured the themes were developed solitary without preconceptions, thus reducing any bias when interpreting the data. Appendix D shows a snapshot from NVivo showcasing the initial coding used.

3.5.6.3 Searching for Themes (Step 3 and 4)

Once the codes were created, the proceeding step in the process was to group similar codes together and derive a theme to describe this. Hence, the data were categorised into themes and sub-themes based on similar meanings and patterns (Silverman 2016). At this stage, links between the assigned codes, themes and corresponding sub themes were formed. To adhere to the studies objectives, once the first round of coding and subtheme categorisation was made, a series of thematic maps were created. These maps were designed to illustrate the findings and were discussed with the supervisory team to ensure the data was being described and categorised in the best manner to enhance the interpretation of the findings. This meant during this analysis stage, the researcher was moving between the themes and existing literature to discover explanations of the findings to ensure the themes that were proposed best described the set of codes created. Appendix D shows an example of one of the initial thematic maps created to illustrate the findings which helped develop the final themes and sub themes which are subsequently described in chapter 4.

3.6 Phase Two of Data Collection (Quantitative Phase - Survey)

Phase two of data collection was conducted quantitatively by distributing surveys. This section of the chapter outlines the nine steps taken to develop the survey questions, scale development process, sampling technique and analysis methods used and how validity and reliability issues were addressed. The survey was distributed to those who currently own a BEV in Wales. To ensure respondents own a BEV and not any other type of EV such as PHEV or HEV, a screening question "Do you currently drive a Battery Electric Vehicle (BEV)?" was asked before proceeding to the rest of the survey. Those that selected 'No' were met with a response to thank the individual for their interest. For the main survey, 859 respondents answered 'Yes' to screening question and from these 426 respondents completed the survey in full, achieving a response rate of 48%. The survey used forced responses throughout to ensure no incomplete answers were possible. The following section outlines how the survey questions were developed.

3.6.1 Developing the Survey Questions

This study followed the nine steps suggested by Lacobucci and Churchill (2018) for the development and validation of survey questions as shown in figure 7.

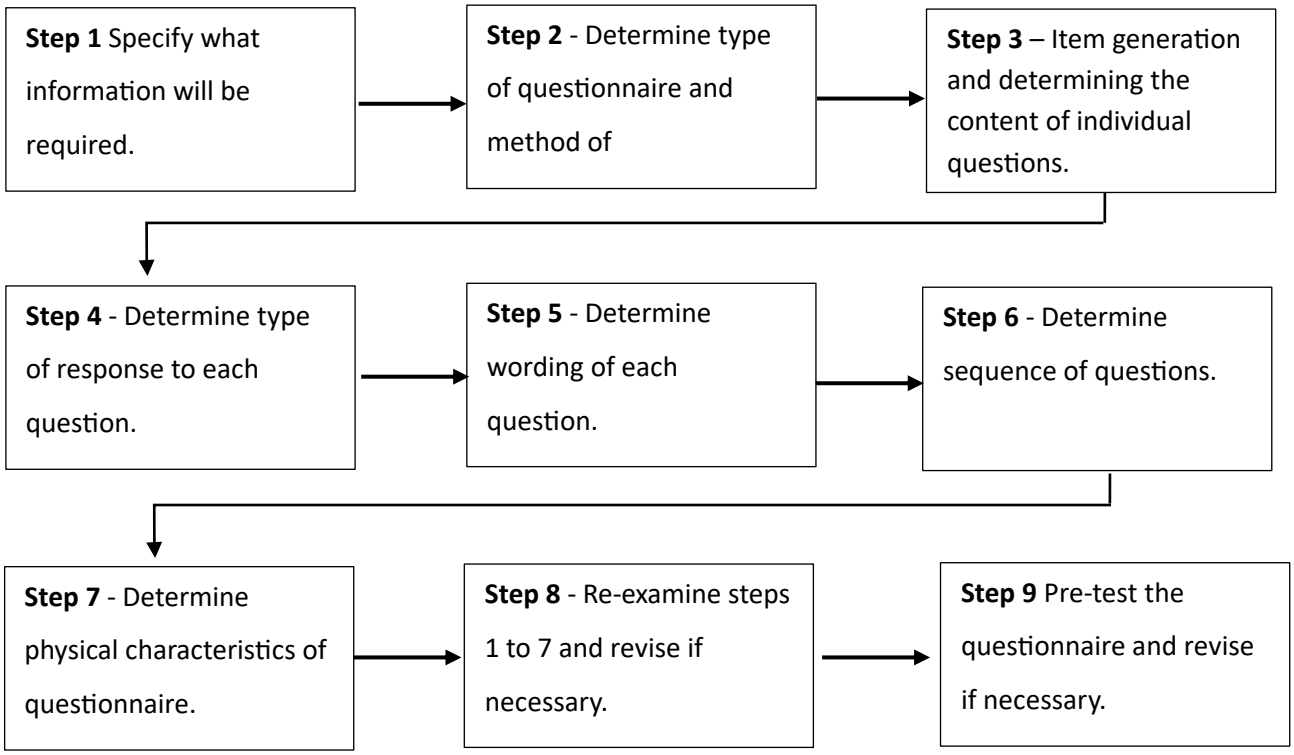


Figure 7 Developing the Survey Questions

Step 1 - Specify what information will be required:

This step involved obtaining the information needed to develop questions that were mainly derived from the findings that were developed during the qualitative phase of the study and corresponding proposed framework presented in chapter 4. The main objective of the survey questions was to ask the respondents whether they held feelings of individual or CPO as part of owning a BEV and if so, how do feelings of pride shape this.
The key constructs that were used to develop and frame these questions were developed during the literature review stage as well as the qualitative findings of this study. Consequently, Consumer Technology Appropriation, Environmental Concern, IPO, CPO, Activated Product Related Identity, Word-of-Mouth, Product Satisfaction, Private Pride (Authentic and Moral) and Public Pride (Collective and Hubristic) represented the constructs used in the survey. Additionally, to attain a comprehensive understanding of the respondent's background to conceptualise and provide context to the findings, sociodemographic (e.g., age, gender, occupation status and which region they are currently residing) and car usage behaviour (weekly average miles driven, how long they owned their car and BEV car brand) questions were also collected.

Step 2 - Determine type of questionnaire and method of administration:

The proceeding step was to determine the type of questionnaire to be used in this study. Although self-administrated online questionnaires are considered as the preferred method of administration due to widespread growth of Internet access (Fielding et al. 2017), other types of questionnaires such as paper and web-based were also considered. However, based on the many advantages of online based questionnaires as highlighted in table 3.6 below: the sole use of online based questionnaires was preferred for this study.

Table 3.6 Determining Questions and Method of Administration.
Flexibility and control over format.
Samples can be collected from a wide geographical dispersion.
Convivence for respondents to participant.
Administrating is quicker than post or phone surveys.
Time and cost effective for the researcher as data entering and coding is avoided.
Reduce effort by respondents by removing need to return questionnaire by post increasing response rate.
Reduce bias as researcher remains distance from respondents.
Online administrations increase anomality and confidentiality.

*S*ource: Adapted from Bryman et al. (2019)

The questionnaire was structured so that closed-ended questions were used. This allowed for the control of the length of each question to take place and maintain order of questions to ensure uniform responses (Edmonds and Kennedy 2017). The questionnaire was administered using Qualtrics Software. This software was chosen given the advantages it provides both to the researcher and to the responded. First, Qualtrics is advantageous because it could instruct the respondents answer the questions in sequence by applying the 'Forced Answer' option. Second, Qualtrics allows the data collected to be exported in its original form to an Excel spreadsheet, which not only enables for a quicker analysis process, but more importantly, reduces human error by manually coding and documenting responses. Third, Qualtrics offers a simple, easy to navigate platform for respondents regardless of the device used to complete the questionnaire thus enabling the researcher to distribute the survey without hesitation on whether potential respondents have the resources needed to take part in the study (i.e simplicity on what technological device is used to complete the questionnaire). Finally, the use of an online questionnaire suits this research as it was targeting those that own a BEV across Wales allowing for a wider audience to be researched in a time and cost-effective manner. In addition to these advantages, limitations with online data collection concerning response rates and measurement errors were also considered (Fielding et al. 2017). In order to achieve the desired response rates, the survey was distributed through various social channels as well as personal and professional networks of the researcher (discussed in further detail in chapter

3.6.2). However, to limit the possibility of duplication and enhance validity, Qualtrics noted the IP addresses of those that responded to reduce the chances of duplicated respondents, thereby enhance the integrity of the data and provide reliability results.

Step 3 – Item Generation and Determining the Content of Individual Questions:

This step determined the individual questions to be included in the questionnaire. Therefore, this step focused on translating the theoretical concepts into measurable variables. The measurement scales were first adapted from established items in the literature and developed and adapted based on the qualitative findings of this study. In general, this involved reviewing literature that has similar grounding to the main theoretical ideas of this study and using this to test relationships to conceptualise a theoretical model prior to developing the measures (Jabareen 2009). Regardless of the constructs proposed it is advised that each construct should use multiple items (questions) to reduce the significant amount of measurement error that are present with single item scales to increase robustness of the constructs (Lacobucci and Churchill 2018). In short, this study used multiple items for each construct proposed as discussed in the preceding section. The questions were developed in order to measure consumer technology appropriation, environmental concern, IPO, CPO, activated product related identity, word-of-mouth, product satisfaction, private pride (authentic and moral) and public pride (collective and hubristic).

Consumer Technology Appropriation

Consumer technology appropriation of the technology features in a BEV was identified in the literature and during interview findings as an antecedent to IPO towards the car. Subsequently, this was measured through 12 items adopted from the widely cited scale used to measure consumer technology appropriation by Wong et al. (2014) which originated from Gaskins (2013). Wong et al (2014) study consisted of 4 items. However, the findings from the interviews conducted revealed that there are three forms of technology which can appropriated as part of owning a BEV. These being; interacting with the plug-in charging system, interacting with the smartphone application and using the autonomous

driving features. As such each of the items as proposed by Wong et al (2014) were subsequently applied to each of these three types of technologies (see Table 3.7).

Table 3.7 Questions Used to Measure Consumer Technology Appropriation.

Construct	Item Label	Statement	References
Interaction with Plug in Charging	CTA01	Understanding how the charging system works, makes me feel as though I am at "the cutting edge" of technology.	Gaskins (2013)
	CTA02	Learning how to get the best output when charging my car, makes me feel more in control of my car.	
	CTA03	Through information learnt from various charging points, I understand more about the charging capabilities of my car	
	CTA04	I am confident in handling general problems that arise when charging my car.	
Interaction with Smartphone Application	CTA05	Understanding how to interact with my car through the smartphone app makes me feel I am at "the cutting edge" of technology.	Wong et al (2014)
	CTA06	After using the smartphone app to interact with my car, I feel more in control of my car.	
	CTA07	Through information learnt from using the smartphone app I understand more about my car.	
	CTA08	I am confident in handling general problems with my car by navigating through the smartphone app.	Qualitative Phase Findings
Autonomous Driving Features	CTA09	Without understanding how the car operates autonomously, I **do not** feel I am at "the cutting edge" of technology	
	CTA10	After using the autonomous features, I feel **less in control** of my car.	
	CTA11	Without gaining information about how the autonomous features work, I **do not** feel I understand how my car operates.	
	CTA12	I **do not** feel confident in handling general problems that arise when using the autonomous features.	

Environmental Concern – Concern for the environment was measured through 12 items adopted from the studies of Peck and Shu (2009) for feelings of attachment towards the natural environment, Sparks and Shepherd (2002) for feelings of green moral obligation and Kaiser et al. (1999) for feelings of assumed responsibly (see Table 3.8).

Table 3.8 Questions Used to Measure Environmental Concern.

Construct	Item Label	Statement	References
Feelings of Attachment Towards Natural Environment	EC01	I feel a strong sense to care for the environment around me.	Peck and Shu (2009) Qualitative Phase Findings
	EC02	I feel connected to my environment around me.	
	EC03	I feel a degree of personal ownership over the environment around me.	
	EC04	I feel a strong sense of closeness with the environment around me.	
Green Moral Obligation	EC05	I would feel guilty if my car damages the environment e.g. produces high levels of CO2 emissions.	Sparks and Shepard (2002) Qualitative Phase Findings
	EC06	Owning a car that negatively affects the environment goes against my moral principles.	
	EC07	I feel that protecting the environment is the right thing to do.	
	EC08	I have an obligation to reduce my environmental impact to meet the needs of future generations.	
Assumed Responsibility	EC09	I feel a degree of responsibility for the condition of the air around me.	Kaiser et al (2007) Qualitative Phase Findings
	EC010	I feel partly responsible for contributing towards environmental problems.	
	EC011	Because I drive a Battery Electric Vehicle, I do not feel I am contributing or responsible for air pollution.	
	EC012	I feel a degree of responsibility to minimise my environmental impact to enhance the lives of others.	

Individual Psychological Ownership – feelings of IPO towards their BEV was measured using 4 items adopted from Peck and Shu (2009) and Fuchs et al. (2010) (See Table 3.9.

Table 3.9 Questions Used to Measure IPO.

Construct	Item Label	Statement	References
IPO	IPO01	I feel connected to my car.	Peck and Shu (2009) and Fuchs et al. (2010)
	IPO02	I feel my car belongs to me, it is "mine".	
	IPO03	I feel a high degree of personal ownership of my car.	
	IPO04	I feel I own this car.	

Collective Psychological Ownership – feelings of CPO for being part of a wider community of BEV owners was measured using 4 items adopted from widely used scales developed by Pierce et al. (2018) and Szamatowicz and Paundra (2019) (See Table 3.10).

Table 3.10 Questions Used to Measure CPO.

Construct	Item Label	Statement	References
CPO	CPO01	We (myself and other Battery Electric Vehicle owners) collectively feel we represent a wider community of eco-conscious drivers.	Pierce et al. (2018) and Szamatowicz and Paundra (2019)
	CPO02	We (myself and other Battery Electric Vehicle owners) collectively agree we are part of an exclusive community of Battery Electric Vehicle owners "this community is ours"	
	CPO03	We (myself and other Battery Electric Vehicle owners) feel as though we represent a group of environmentally responsible individuals	
	CPO04	We (myself and other Battery Electric Vehicle owners) collectively agree we are taking positive action towards caring for "our" environment	

Collective Pride – feelings of collective pride for being amongst those that also own a BEV was measured through 15 items adapted from Sullivan (2014) and Harth et al. (2013) as well as the qualitative findings. Each of the three constructs used to measure collective pride were derived from the qualitative findings of this study. The subsequent items were adopted from the measurement scale Sullivan (2014) and Harth et al. (2013) studies (see Table 3.11).

Table 3.11 Questions Used to Measure Collective Pride.

Construct	**Item**	**Statement:** Collectively myself and other Battery Electric Vehicle owners feel …….. knowing that together we belong to an exclusive group of drivers on the road.	**References**
Collective Pride – Part of Exclusive Group	CP01	Accomplished	Sullivan (2014) Harth et al. (2013) Qualitative Phase Findings
	CP02	Achieving	
	CP03	Confident	
	CP04	Productive	
	CP05	Successful	
		Statement: Collectively myself and other Battery Electric Vehicle owners feel ……. knowing that together we **use the latest technology** when it comes to driving.	
Collective Pride - Using the latest Technology	CP06	Accomplished	
	CP07	Achieving	
	CP08	Confident	
	CP09	Productive	
	CP10	Successful	

		Statement: Collectively myself and other Battery Electric Vehicle owners feel …… knowing that together **we are encouraging others** to be more environmentally responsible?	Continued: Sullivan (2014) Harth et al. (2013) Qualitative Phase Findings
Collective Pride - Behaving Environmentally Responsible	CP11	Accomplished	
	CP12	Achieving	
	CP13	Confident	
	CP14	Productive	
	CP15	Successful	

Hubristic Pride – feelings of hubristic pride to assess whether individuals feel superior to those who do not own a BEV was measured through 8 items adapted from the established and well used scale by Tracey et al. (2007) as well as the qualitative findings (See Table 3.12)

Table 3.12 Questions Used to Measure Hubristic Pride.

Construct	**Item**	**Statement:** Having access to and interacting with various technology features in my car I sometimes feel…….over those who do not own a BEV.	**References**
Hubristic Pride - Comparison against NON BEV owners	HP01	Snobbish	Tracy et al (2007) Qualitative Phase Findings
	HP02	Stuck-up	
	HP03	Egotistical	
	HP04	Smug	
		Knowing that my car **does not** emit CO2 I sometimes feel……over those who **do not own** a BEV	
Hubristic Pride - Not emitting CO2	HP05	Snobbish	
	HP06	Stuck-up	
	HP07	Egotistical	
	HP08	Smug	

Authentic Pride – feelings of authentic pride was used to measure whether individual feel pride following their ability to interact with the various technology features in their BEV. Authentic Pride was measured through 7 items adopted from the established of Tracy et al. (2007) as well the findings from the qualitative phase of this study (See table 3.13)

Table 3.13 Questions Used to Measure Authentic Pride

Construct	**Item**	**Statement** Having access to and interacting with various technology features in my car I feel…….. about myself.	**References** Tracy et al (2007) Qualitative Phase Findings
Authentic Pride	AP01	Accomplished	
	AP02	Successful	
	AP03	Achieving	
	AP04	Fulfilled	
	AP05	Self-worth	
	AP06	Confident	
	AP07	Productive	

Moral Pride – feelings of moral pride was used to measure whether pride was felt among individuals for acting on their environmental moral principles and values by choosing to own a BEV. Subsequently, moral pride was measured through 4 items adopted from the studies by Etxebarria et al. (2015) and McLatchie and Piazza (2017) (See table 3.14)

Table 3.14 Questions Used to Measure Moral Pride.			
Construct	**Item**	**Statement:** Thinking about yourself and owning a Battery Electric Vehicle how do you feel about your impact on the environment?	**References**
Moral Pride (MP)	MP01	I feel proud knowing my car demonstrates I have taken action to reduce my environmental impact.	Etxebarria et al. (2015) McLatchie and Piazza (2017)
	MP02	I feel proud that my car does not cause a negative environmental impact to the people around me.	
	MP03	When I drive my car, I feel proud knowing I am behaving in an environmentally responsible way.	
	MP04	When I drive my car, I feel proud about myself when I see others on the road driving petrol or diesel cars.	

Activated Product Related Identity – To measure whether individuals self-associate with or defines the self in terms of the symbolisation of their BEV or for feelings part of a wider community, activated product related identity was measured through 5 items adopted from Weiss (2013) and Prieto et al (2018) a well as the qualitative findings (see Table 3.15)

Table 3.15 Questions Used to Measure Activated Product Related Identity.			
Construct	**Item**	**Statement**	**References**
Activated Product Related Identity (APRI)	APRI01	My car helps me achieve the identity I wish to have	Weiss (2013) Prieto et al (2018) Qualitative Phase Findings
	APRI02	My car helps narrow the gap between who I am and who I try to be	
	APRI03	My car incorporates parts of myself	
	APRI04	There is an overlap between the technology features of my car and my identity (they both signal being tech savvy)	
	APRI05	There is an overlap between the environmental benefits of my car and my identity (they both signal being environmentally responsible)	

Word-of-Mouth – Word-of-mouth was measured through 4 items adopted from studies of Fuchs et al. (2010) and Lisjak et al. (2021) (See table 3.16)

Table 3.16 Questions Used to Measure Word-of-Mouth.

Construct	Item	Statement	References
Word of Mouth (WOM)	WOM01	I would recommend a Battery Electric Vehicle to those who do not yet own one	Fuchs et al. (2010) Lisjak et al. (2021)
	WOM02	I would say positive things about owning a Battery Electric Vehicle to those who do not yet own one	
	WOM03	I would spread the word about owning Battery Electric Vehicle to those who do not yet own one	
	WOM04	I would mention Battery Electric Vehicle to others quite frequently	

Product Satisfaction - Product Satisfaction was measured through 3 items adopted from studies of Smith et al (2022) as well as the findings from the qualitative phase of the study (See table 3.17)

Table 3.17 Questions Used to Measure Product Satisfaction.

Construct	Item	Statement	References
Product Satisfaction	PS01	I enjoy driving a Battery Electric Vehicle	Smith et al (2022) Qualitative Phase Findings
	PS02	My car meets or exceeds my expectations of Battery Electric Vehicles	
	PS03	Overall, I am satisfied with my Battery Electric Vehicle	

Step 4 - Determine Form of Response to Each Question

The following step was to decide which response to use for each question by evaluating whether to include open-ended or close-ended questions. The differences in these types of question formats depend on whether the role of the respondent is to share their viewpoints and opinions without influence of the researcher as is the case with open-ended questions. Conversely the inclusion of close-ended questions limits the respondents such that no alternative response can be given other than what the researcher is suggesting (Reja et al. 2003). Following the decision to use a self-administered online questionnaire, it was necessary to ensure the quality of data being collected was robust and convincing therefore, only close-ended questions were used. There are several advantages of using close-ended questions with the online questions these being; better comparability with other responses as each respondent answered the same question provided this was correctly understood and quicker time to complete questionnaire (Krosnick 2018). Having said this, recognising that close-ended questions have potential disadvantages such as; not being able to provide instructions or clarifying any unclear terms with the questions in addition to respondents answering with neutral options where select items inaccurately reflect their response was acknowledged by the researcher (Reja et al., 2003). Overall, the decision to use close-ended questions was made. For each possible response the respondent was offered the possibility to respondent with 1: 'strongly disagree to 7: 'strongly agree' such that a 7-point Likert scale was adopted. Likert scales are a common response type for promoting opinions in consumer behaviour research (Taherdoost 2019; Hair et al. 2020). The 7 point Likert scale allows for middle, neutral and undecided responses which have been widely considered a straightforward and accurate measure of the respondents' opinions and evaluation of the items (Joshi et al. 2015; Edmonds and Kennedy 2017; Haws et al. 2023).

Step 5 - Determine Wording of Each Question

This step determines the choice of words used for each question to ensure no ambiguous or unclear wording was used (Creswell 2014; Lacobucci and Churchill 2018). As mentioned by Tashakkori and Teddlie (2010), poorly can lead respondents to misinterpret the question, respond incorrectly or even refuse to answer. Hence, to ensure questions were not phrased using ambiguous words, consistency with the wording and use of simple laymen language

was used throughout. Additionally, the questions were designed to avoid any leading in which the researcher could suggest the correct answer to choose thus resulting in measurement errors. Furthermore, to verify the wording used for each question was suitable, relevant, and accurately reflects the purpose of the question, the questionnaire was pre-tested which is discussed later in Step 9.

Step 6 - Determine Sequence of Questions

The next step was to consider the sequence of the questions. To avoid confusing respondents and reduce the risk of the respondent losing the motivation to complete the questionnaire, it was vital the questions were logically sequenced. This study adopted the guidance suggested by Lacobucci and Churchill (2018) which is to begin the questionnaire with general and easy to answer questions leaving the sensitive and personal questions at the end. The following sequence of the questions was adopted:

1. Screening questions were asked to determine whether respondents own or drive a Battery Electric Vehicle (BEV) and not any other type of EV such as HEV or PHEV as well as being over the age of 18.
2. The opening question used concerned whether respondents feel a degree of control over their car by being able to use its various technology features such as plug-in charging. The purpose of which was to ensure the questionnaire began with a simple but interesting thought.
3. The main body is where the complex questions were presented which then proceeded to asking socio-demographic and sensitive questions.

The first section questioned the respondents about appropriating technology and environmental concern. This was followed by questions concerning the main independent variables in this study; individual and collective PO (IPO and CPO). To stay consistent with the discussions on CPO questions concerning feelings of collective pride (one of the moderator variables) were asked. Following this, other forms of pride that were more individual in nature were then asked. These being; authentic, hubristic and moral pride. These forms of pride reflected the mediating and moderating variables in the study. Finally, the questionnaire concluded by addressing the dependent variables; activated product

related identity, word-of-mouth and product satisfaction before ending with background and personal questions.

Step 7 - Determine Physical Characteristics of Questionnaire

The following step was to determine the layout and physical characteristics of the questionnaire, as this can determine whether respondents are willing to respond, the accuracy of the chosen responses and inclination to complete the questionnaire (Lacobucci and Churchill 2018). As this questionnaire was developed using Qualtrics software, the overall physical characteristics and layout were set by the software itself. Having said this, to encourage a sense of credibility of the study and its corresponding institution, the use of Cardiff University template such as logo and colour scheme was applied throughout.

Each construct and its corresponding question were presented in separate blocks. In doing so this offered the impression the questionnaire would not be time consuming, thus encouraging the respondent to participate until the end of the questionnaire (Lacobucci and Churchill 2018). Each question was numbered primarily to help the respondent complete the questionnaire chronologically and ease the analysis of the data. Moreover, a page break was applied as to simplify the movement between various questions. Prior to the beginning of the questionnaire, a cover letter was outlined highlighting the purpose of the research and the requirements of the respondent that needed approval by the respondent to confirm their understanding. Finally, Qualtrics software allows the researcher to create a questionnaire that can be easily accessed irrespective of the device (desktop PC or mobile) used, thus reducing the bias of lack of access and compatibility from potential respondents.

Step 8 - Re-examine Steps 1 to 7 and Revise if Necessary

This step involved reviewing and re-examining the questions once the initial draft was completed to ensure the language and overall layout used was not confusing, insensitive or ambiguous. Following this assessment proceeded to step 9, pre-testing the question items.

Step 9 Pre-test the Questionnaire and Revise if Necessary

The final step of pre-testing the questionnaire plays a key role in data collection as it helps identify potential problems and inconsistencies prior to inviting respondents to participate in the study (Krosnick 2018). The benefits of pre-testing the questionnaire are that it allows the estimation of the appropriateness of the study's design to uncover whether respondents will understand the questions as intended to yield reliable and accurate data (Groves 2009). Before carrying out and collecting responses for the actual questionnaire, both a pre-test and pilot study was conducted respectively. The pre-test involved distributing the questionnaire to a small sample of 11 respondents to verify the length, sequence and question wording by collecting feedback from each respondent. This helped to further develop the questionnaire to ensure the questions and overall survey design were easy to understand and answer. Prior to the pilot study, a consultation with three academic researchers was carried out to review the survey and were asked to rate the appropriateness and the clarity for each statement used as well as the choice of wording. As a result, some changes to the wording of questions were made to eliminate ambiguous wording. This procedure subsequently enhanced the content validity of phase two of the study.

Following the pre-test, the questionnaire was distributed as part of a pilot study to assess the research instruments as a whole (Bryman et al. 2022). A total of 101 complete responses were collected which revealed the average time to complete the questionnaire was 14 minutes. The quickest completion time (9 minutes 10 seconds) was also noted as this was later used as benchmark to measure response reliability during the main survey. At the end of the questionnaire 3 open ended questions including "were the questions clearly understood?" were obtained to gain feedback from the respondents to better validate and enhance the measurement constructs and survey design. Additionally, to assess the validity and reliability of the items prior to collecting the main responses, scale purification was conducted according to guidelines set by Haws et al. (2023) was carried out. This process was part of an exploratory factor analysis (EFA), which was also conducted assessing assess

the validity, reliability, appropriateness, and comprehensiveness of the scale with the 101 responses collected in the pilot test.

The processes and steps taken are discussed in detail further into the thesis in chapter 5. Overall, a rigour approach was adopted during as part of pre-testing the questionnaire to increase the study's validity and reliability, gain an insight into the true responses towards the questions and reflect on whether the proposed constructs are suitable for measurement and testing.

3.6.2 Recruitment Process and Sampling

3.6.2.1 Recruitment Process

The strategy used to select an appropriate sampling method for quantitative research was defined by the research objectives of the study whilst acknowledging limitations in time and money (Bryman et al. 2022). In general, sampling considers how the study's participants are to be selected which is largely shaped by the sampling method used to identify and recruit potential participants (Antwi and Hamza 2015; Edmonds and Kennedy 2017). Instilling a robust sampling method ensured the findings drawn from the data were based on an accurate representation of the population to which the study is based on. In quantitative research, the sampling method can be categorised as probability sampling or non-probability sampling (Cassell et al. 2018). Probability sampling is associated with random sampling in that all cases in the target population have a probability of being selected greater than zero (Saunders et al. 2015). Examples of this type of sampling involve cluster random sampling, systematic sampling and random sampling (Saunders et al. 2015). Conversely, non-probability sampling equates to the other sampling methods which are non-random, such as quota sampling, snowball sampling and convenience sampling (Bryman et al. 2022).

While both sampling methods are widely used in quantitative research, they have both benefits and limitations. First, the findings produced using probability samples can be used to generalise a population (Bryman et al. 2022). Given the random nature of this type of sampling, the results are argued to be more rigorous as results are based on an unbiased

method of sample selection. Having said this, probability sampling is not always feasible or the most suitable choice of sampling method particularly in studies that do not have sampling frames (such as this study) (Tashakkori and Teddlie 2010). On the other hand, nonprobability sampling uses a non-random technique to collect samples from a subset of a population to inform the entire population. This study employed four sampling approaches as part of nonprobability sampling: quota, selective, snowball and convenience.
Quota sampling allow the researcher to create "quotas, based on demographic or classification factors selected by the researcher" to directly target potential participants that are best suited for the context of the study (Gates and McDaniel, 2015, p.326). In other words, because quota sampling uses pre-specified parameters, the samples are not selected at random, which reduced selection bias (Gates and McDaniel 2015). Conversely, selective sampling relies on the researchers' judgment to invite participants who meet the requisite characteristics of this study. Whilst snowball sampling involves asking participants to actively seek and recruit other potential participants who would fit the study's purpose. Although selective and snowball sampling offers a quick and cost effective approach to increase the sample size, it should be noted that the margin of error and selective bias are introduced indirectly by recruiting participants (Antwi and Hamza 2015; Bryman et al. 2022). Finally, convenience sampling relates to recruiting participants that are 'convenient' to the researcher. This form of sampling is best used when conducting a pilot study (Krosnick 2018).

As the context of this study is interested in examining the ownership feelings of BEV owners of those living across Wales, it was logical to include a mixture of; selective sampling, snowball sampling, convenient sampling and quota sampling for the following reasons. First, convenient sampling was used to identify potential participants in the pilot phase of the study. An example of which includes approaching BEV owners at various public charging stations close to the university establishment. Secondly, selective sampling was used whereby acquittances and colleagues of the researcher who own a BEV were approached as well as capitalising on various 'EV owner' groups across social networking sites to recruit participants. An example of one of these groups is "EV Owners in Wales" on Facebook, with over 2,000 members as of March 2023. In both cases, snowball sampling and quota sampling were also used. First, each participant was asked to recruit potential participants

who could potentially participate in the study. Finally, quota sampling was used throughout the pre-test, pilot and final survey in that participants used in this study must meet the requirement of being 18+, living in Wales and own a BEV and not any other type of EV such as PHEV or HEV.

3.6.2.2 Determining Sample Size

The final step taken was determining the sample size. However scholars reading research methods (Saunders et al. 2015; Hair et al. 2020; Bryman et al. 2022) suggest a minimum of 100 participants are required for quantitative research. However, it is important to obtain a sample size for the desired statistical analysis approach. As this study employed a combination of descriptive analysis, exploratory factor analysis (EFA) for scale purification, confirmatory factor analysis (CFA) for measuring the model and multiple regression analysis to test the hypothesis, it was necessary to collect a large sample size was collected to meet the analysis requirements. The sample size required for the study was largely based on the data analysis technique used to confirm the measurement model by conducting CFA as well as the analysis technique used to test the hypothesis (multiple regression and path analysis). Determining an adequate simple size for CFA and the subsequent processes involved in structural equation modelling (SEM) have long been debated with the overall objective to achieving stable, trustworthy results that are meaningful to the model (Harrington 2009). To carry out CFA, a modest sample size was expected. According to Hair 2010 and Kline (2014) the ratio of the number of people (N) to the number of measured variables (p) must be considered to ensure a rich sample size is collected. A widely accepted ratio used in scholarly research is between 5 to 10 cases (responses) per indicators (survey items) in order to obtain accurate estimates of the model parameters (Hatcher and O'Rourke 2014; Kline 2014; DeVellis 2017). Hence, it was necessary that there was a minimum of five cases for each indicator as anything below this point, the findings maybe misrepresentative of the population given the statistical instability involved.

This study followed these guidelines as the main survey consisted of 57 items and achieved 426 responses and sits within the range suggested by scholars. This sample size also exceeds the suggestion of Hair et al. (2010) who proposed a sample size between 100 to 400 responses is suitable for CFA analysis. Since the final sample size recorded for this study was

n= 426, this met the requirements for conducting CFA.

In regards to the regression analysis (Groves 2009; Edmonds and Kennedy 2017; Bryman et al. 2022) suggests although there is no fixed number of samples needed, the researcher should aim for 5-10 participants per predictor variable. Since this study has 11 variables a sample size of at least 110 is suitable to carry out regression analysis. Given the final sample size was n= 426 this also exceeded the suggested guidelines. Finally, the consideration of similar studies that examined feelings IPO or CPO were used; (Fuchs et al. 2010; Brasel and Gips 2014; Gineikiene et al. 2017; Szamatowicz and Paundra 2019) who obtained a sample size between 280 – 360. Thus, since the current study collected 426 usable responses which exceed these parameters, a sufficient sample size was deemed achieved.

3.6.3 Method of Analysing Quantitative Data

This study employed several statistical techniques to analyse the data. A range of data analysis techniques were used namely; descriptive analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA) Hierarchical Multiple Regression Analysis, and Path analysis all using SPSS v29, AMOS v27 software and PROCESS macro Hayes V4.2.

The descriptive analysis assessed the mean, standard deviation and response frequency and was used on the pilot study dataset to understand and consider the response scale percentages. For the main dataset, descriptive analysis was again applied in order to assess the demographic information attained to present an overview of the respondent's profile. Consequently, the respondent's gender, age group, education level, average miles driven each week, length of ownership, ownership type, car brand and geographic location were presented and compared between the groups.

To improve the reliability and validity of the measurement instrument, EFA was employed using SPSS by applying the principal component analysis approach to the pilot study dataset to evaluate the reliability of the constructs and purify the scale items. The first step involved presenting the response scale percentages for each item, along with its mean and standard deviation score. Following this, the Cronbach Alpha score (Cronbach 1951) was assessed for each item to observe whether the item exceeds the minimum 0.7 value and further had a value of at least 0.4 for the item to item correlation (Hair et al. 2020; Haws et al. 2023). Following this, to determine the strength between the relationship of the items, assessment

of the Kaiser-Meyer-Oklin Measure of Sampling Adequacy (KMO) value was applied where it is recommended to have a value greater than 0.6 and (Tabachnick and Fidell 1996). Additionally, to support this, identification of whether the results from the Bartlett's Test of Sphericity was statistically significant was also carried out. The final step of EFA was then to assess the correlation matrix for evidence where a coefficient greater than 0.5 is needed (Kline 2014; Hair et al. 2020).

Following this, once the main survey responses were collected, CFA was used to test the validity of the proposed model by examining the relationship between the observed variables and their underlying latent factors to reveal acceptable levels of goodness-of-fit and evidence of construct validity (Hair et al., 2010). This procedure was conducted using AMOS 27 software to ensure that the theoretical model fits the observed data while also assessing the strength and direction of the relationships among the variables. To complement this, a range of goodness-of-fit indices was used to measure the consistency of the proposed model with the observed data. The indices were derived from the three main categories of indicators used to confirm model fit: absolute fit indices, incremental fit indices, and parsimony fit indices (Hair et al. 2020). Subsequently, the use of goodness-of-it (GFI), root mean square of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and parsimony normed fit index (PNFI) were employed in this study and results presented in chapter 6.4.2. Finally, assessment of overall model fit was measured using minimum discrepancy by dividing the maximum likelihood by degree of freedom (CMIN/DF). The acceptance level of each and the results obtained from the dataset are outlined in chapter 6.6 when presenting the findings.

To test the hypothesis generated in this study, hierarchical multiple regression analysis and path analysis using SPSS PROCESS macro Hayes (Hayes 2018) was used. Throughout the analysis the same 4 control variables were used as these could cofound the results; gender (male =1, female =0) ownership type (ranges from 1 = outright purchase, 2= private lease, 3= lease by salary sacrifice scheme, 4= company car and 5 = car share), car brand (1= luxury, 2= premium and 3 =mainstream) and length of ownership (ranging from 1= under 6 months, 2= between 6 months – 1 year, 3 = between 1 -2 years, 4= between 2- 3 years, 5= between 3 -4 years and 6 = 4 years +).

Although a range of statistical analysis could have been used such as structural equation modelling (SEM) and multi variance analysis of variance, the first justification for using hierarchical regression was to observe the extent to which the predictor variables explained a statistically significant amount of variance in the dependent variable. Thus, when comparing the difference between IPO and CPO and their respective outcomes, regression analysis and path analyses offer a good indication to isolate the differences between the variables. Second, regression analysis is augured to be a more flexible technique than SEM, as it allows the assessment of the difference between control variables and main independent variables by calculating the R^2 change, variance inflation factor and normality. (Tabachnick et al. 2019; Hair et al. 2014). Third unlike regression analysis and path analysis, SEM relies on latent variables that have been debated to be problematic, as these variables are somewhat imaginary and hence do not follow a set scale, thus are given arbitrary units known as factor indeterminacy (Ramlall 2017). Moreover, since SEM follows the maximum likelihood approach that is, a full-information technique, as opposed to partial information as seen in OLS regression analysis, when an error arises in the parameter this can generate other errors that arise further into the analysis process (Ramlall 2017). Therefore, hierarchical multiple regression was selected to test the direct effects in the proposed model.

As for analysing the moderators and mediators, path analysis by using PROCESS macro was used. A key benefit of PROCESS macro is being able to test the mediation, moderation and interaction effects using boot-strapping samples, meaning it can increase a model's predictive validity without needing to verify normality assumptions (Hayes et al. 2017). Hence, to identify whether a mediating or moderating effect occurred in the model, the bootstrapping method was applied where this relates to the process of resampling the data multiple times to estimate the distribution of the sample of the indirect effect (Hayes 2018). Bootstrapping provides an accurate confidence interval to verify mediating and moderating effects. Accordingly, 5000 samples were used and a confidence at 95% was generated such that if a zero was not present between the lower and upper confidence intervals, the model suggests an indirect effect is taking place, that is, the presence of a mediator or moderator (Hayes 2018). Therefore, a range of models were applied to the dataset accordingly, depending on where the testing of mediating or moderating variables was taking place. In

summary, Models 4, 6 and 87 were used where are the results for each are presented described in detail in forthcoming chapter 6.5.4, 6.5.5 and 6.5.6. Other recent studies on PO theory have used a similar approach of using PROCESS macro to test mediation and moderation (Yuan et al. 2021; Malhotra et al. 2022) and therefore supports the decision to approach the analysis using this technique.

3.6.4 Assessing Reliability and Validity of the Measurement Instrument

To assess the reliability and validity of the instrument used in the survey, it is vital to assess the scale of the items proposed to measure the phenomenon (Haws et al. 2023). Thus, a reliable and valid scale is one that is said to have items that intercorrelate with each other sufficiently to measure the same construct and provide consistent measurement (Sürücü and Maslakçi 2020). Moreover, the validity of what the scale is intends to measure is only achieved when the measures used accurately reflects the observed and unobserved constructs (Sürücü and Maslakçi 2020). In other words, the findings were valid when the items used are correct allowing the respondents answer accurately.
Several tests were used to assess the reliability and validity of the measurement instruments in the survey of this study, including content validity, construct validity and criterion validity (Lacobucci and Churchill 2018; Haws et al. 2023). This section illustrates the steps taken to maximise reliability and validity of the scale for the purpose of increasing scale robustness.

Content Validity

Content validity was carried out during the pre-test and pilot stage of the study. This involved assessing the extent to which the scale items captured the constructs of the model emphasising on whether its definition is being accurately measured (Lacobucci and Churchill 2018). As Hair et al. (2020) argued, opinions and judgements from experts in the field can aid in establishing content validity. Thus, to verify the suitability of the questions proposed first, questions were derived from established scales following an extensive literature review as well as findings from the qualitative phase of this research. Here, both the interview transcripts and corresponding literature were reevaluated to check whether each item used is relevant to the context of this study, BEV ownership, and thus retained for the

pre-test stage. Second, these were then examined by multiple academics to examine the proposed items, particularly their wording to warrant these representing the purpose of the scale and definition of the model's constructs. Third, during the pilot study, respondents' evaluations of the items were reflected upon to improve the scale and overall suitability measurement instrument (Lacobucci and Churchill 2018). Whilst content validity serves a robust purpose, as emphasised by Edmonds and Kennedy (2017); Sürücü and Maslakçi (2020); Bryman et al. (2022) this procedure alone is insufficient in validating the scale hence, construct validity was also carried out.

Construct Validity

Construct validity questions the theoretical relationship between variables and whether the measurement instrument measures the theoretical constructs accurately (Hair et al. 2020). Thus, construct validity is usually achieved by testing correlations between the constructs and its items (Kline 2014). This was first carried out on the pilot survey data to ensure when the main responses were collected the items used are fit for its purpose and statistically robust and sound to measure the intended constructs. Thus, if strong correlations between the constructs are found, they it converge on a common underlying construct (Lacobucci and Churchill 2018). In other words, this step checks whether there is a correlation between two measures of the same construct. To achieve this, the factor loading was examined using SPSS V29 by following the procedures of Principle Component Analysis (PCA) as part of EFA to statistically identify whether the extracted factors converge on common points (Kline 2014; Hair et al. 2020). For factor loading to be statistically significant, a factor loading value greater than 0.5 (ideally higher than 0.7) must be achieved (Kline 2014; Haws et al. 2023). Prior to determining the number of factors to extract as well as the extraction method, reliability assessment of the items by assessing the Cronbach Alpha scores was applied which resulted in retaining a total of 57 items to conduct PCA (Cronbach's 1951). Subsequently, the first determinition of the appropriteness of the data by checking the KMO value was between 0 -1 (recommended > 0.6) (Tabachnick and Fidell 1996), and statistical significance was assessed using the Bartlett's Test of Sphericity. To determine the number of factors to extract, Eigenvalues were assessed as these represent variance accounted for by each underlying factor (Kline 2014, Hair et al. 2020). Here it is recommended only to retain

factors with a value greater than 1, which resulted in 11 factors extracted (Kline 2014). Finally, factor values were computed using Varimax Orthogonal rotation method as this meant factors were assumed to be uncorrelated with one another as to produce lower sampling errors.

For the main dataset, to assess construct validity AMOS V27 was used to carry out Confirmatory Factor Analysis (CFA). Here, the acceptance values for factor loadings as noted by (Anderson and Gerbing 1988; Hair et al. 2010) were checked such that the t-value must be greater than ± 1.96 when P <0.05. Additionally, standardised factor loadings were also checked where the minimum value should be at least 0.5 but recommended to be above 0.7 (Hair et al. 2010). Moreover, steps were taken to assess whether the construct has discriminant validity (Hair 2010; Hoyle 2023) rigour method of assessing the average variance extracted (score should be higher than 0.5) Finally, to establish unidimensionality to verify if the items can be summarised by one underlying construct, a range of goodness-of-fit indices was used as previously noted. These being: goodness-of-it (GFI), root mean square of approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis index (TLI), and parsimony normed fit index (PNFI). Finally, the overall model fit was measured first using maximum likelihood (Chi-Square $\chi 2$ statistic) and then by determining maximum likelihood by degree of freedom (CMIN/DF).

Scale Reliability

The reliability of the measurement instrument was used to ensure the degree of consistency in the items used to measure the desired construct (Lacobucci and Churchill 2018). Hair et al. (2020) stresses that reliability does ensure the accuracy of the scale but rather its consistency. This is important as it verifies whether the scale is stable and consistent enough to produce replicable results in other contexts (Bryman et al. 2020, Haws et al. 2023). The most widely used method to assess reliability of a scale is to examine internal consistency. Here, Cronbach's (1951) Alpha coefficient value was calculated, where it is recommended that scales should have an alpha score greater than 0.7, to be accepted as reliable (Hair et al. 2020; Sürücü and Maslakçi 2020; Haws et al. 2023). The study employed this test during the pilot phase of the study to help purify the scale and reduce the number of items to be

carried forward when conducting PCA. The outcomes of the coefficient alpha and factor analysis are reported and discussed in Chapter 5.4.

Managing Common Method Bias

Common method bias (CMB) can surface in the data collection process when there is statistical variance caused by the measurement method, which results in an overestimation of the relationship between the variables (Podsakoff et al. 2003). In other words, CMB can misrepresent the empirical results and conclusions drawn from the study.

One of the most frequent ways in which CMB takes place in survey based research, is when the dependent and independent variables are measured in the same survey and use the same response method (e.g. ordinal scales) (Baumgartner and Weijters 2012). Hence, CMB impacts the validity of the study, as it impacts both the measures and the relationships between variables.

Thus, to increase the reliability of the study and reduce CMB one approach taken was to allow individuals to participate in the study regardless of the brand of BEV they own, how long they owned their car or what region in Wales they reside in. Thus, this study was not solely based on single source. Second, the questions were developed such that it reduces the risk of socially desirable responses by assuring respondents in the cover letter and consent form their involvement is voluntary with complete anonymity and confidentiality, as well mentioning there are no wrong or right responses (Ismail and Hilal 2023). Additionally, questions were arranged in such a fashion that there was a separation between the independent and dependent variables of the study, as suggested by (Podsakoff et al. 2012). Expanding on this, two attention checking questions (e.g. please select strongly agree for this question) were added to the survey to ensure respondents were focused and answering the questions genuinely. Another measure to reduce respondents' apprehension was to make it clear in the consent form there were no wrong or right answers to the questions of the survey. Moreover, the main constructs of the study were placed in different sections of the survey to reduce the possibility of respondents' making connections between the variables. Finally, CMB was reduced using the widely used statistical technique of Hardman's single factor test (Podsakoff et al. 2012). This test was conducted using SPSS to identify whether CMB was present in the sample for the actual

responses (n= 426). The results showed the highest total variance extracted by one factor was 32.4%. This result was considered satisfactory as it was below the 50% requirement meaning that variance explained by a single factor was not the source of CMB as argued by Podsakoff et al. (2012). Based on the actions undertaken to reduce the possibility of CMB, these results suggest that it was unlikely to be an issue for this study.

3.7 Ethical Consideration

Throughout the research process, various ethical challenges that became apparent. Wallace and Sheldon (2015) emphasises that it is necessary to identify possible ethical issues in research especially those involving participants as this may interfere with the respective research design and data collection process. These issues are somewhat inevitable in qualitative research since they encompass understanding and documenting individuals' behaviour (Silverman et al. 2016). Nonetheless, it is important that a vigilant approach was taken to identify any potential ethical risks which may adversely impact the research.

In preparation for the data collection procedure, ethical approval was obtained following compliance with Cardiff University's requirements. Prior to the data collection process, the participants used for both the interviews and the survey were provided with a consent form. This form explained; the purpose of the research, the expected outcomes, the benefits of taking part in the study, the option to withdraw from the study, reiteration of the voluntary nature of participation, the approach taken to safely store the data, key contact information about the researcher and supervisor team if any concerns arose, and a guarantee for confidentiality and anonymity for data collected by using pseudonyms names (applicable only for the qualitative phase of the study) (Saunders et al. 2015).

Consequently, the participants were requested to sign the consent form (Appendix C and F) to ensure they understood the study and their expected participation. For the interviews specifically, consent was also obtained to request the interviews to be audio-recorded and transcribed. Most importantly participants were reminded that they had the right to withdraw from the study at any stage. It was also made clear that participants involved in the survey were free to withdraw from the study without consequence.

Finally, to manage and respond to any ethical concerns that may arise during the interviews, particularly regarding participants' behaviour, an attentive observation was made to seek

any indication of discomfort and abided by the ethics committee code of conduct when necessary.

3.8 Chapter Summary

This chapter presented a comprehensive account of the research methodology used in this study and provides justifications for the: research paradigm, research design and methodology procedures followed to collect data and analyse the data. Further, it sheds light on the issues relating to measurement validity and reliability and ethical considerations. In conclusion, the epistemological standpoint of the study is pragmatism, which employs an explanatory sequential mixed-method design that compromises two data collection phases. The first was a qualitative phase involving in-depth interviews with existing BEV owners, in which data was analysed thematically using NVivo. The second phase being quantitative involving a series of surveys (pilot and main) and analysed using; descriptive analysis, EFA, CFA, multiple hierarchical multiple regression, and path analysis by using SPSS and AMOS software. In summary, EFA was used to compress the data set and reduce the items from the survey, CFA was used to assess good model fit, and hierarchical multiple regression was used to test the direct hypothesised relationships while controlling for variables that could otherwise cofound the results. Finally, path analysis using PROCESS macro was used to test the mediating and moderating effects such that Model's 4, 6 and 87 were used. The proceeding chapter (chapter 4) presents and discusses the findings of the qualitative phase before reporting the findings of the quantitative phase in chapters 5 and 6.

CHAPTER 4

QUALITATIVE PHASE FINDINGS – INTERVIEWS WITH BEV OWNERS

4.1 Introduction

This chapter presents the findings that were developed from interviewing 24 existing BEV owners from Wales and prompting them to reflect on their feelings of ownership towards their BEV. This chapter builds on the knowledge and prior findings concerning PO by delineating the extent to which BEV owners have feelings of PO and how these feelings come to fruition. Moreover, this chapter explores the consequences of holding PO feelings to gain a fuller understanding of this construct in the context of BEV ownership. Since this phase was conducted qualitatively, the findings present the real-life experiences of PO, which unlike prior research conducted on PO that mostly adopts a quantitative approach, the findings offer a rich qualitative insight about feelings of PO.

The data was organised by collating and developing themes based on similar patterns expressed within the transcripts. Following the interpretation, analysis and coding of the data, several themes were developed (see figure 8). **First**, evidence that feelings of PO in the context of BEVs indeed take place on an individual and collection level. **Second**, there are eight antecedents that instigated feelings of both individual and collective PO. **Third**, there are three key outcomes of holding feelings of individual and collection PO.

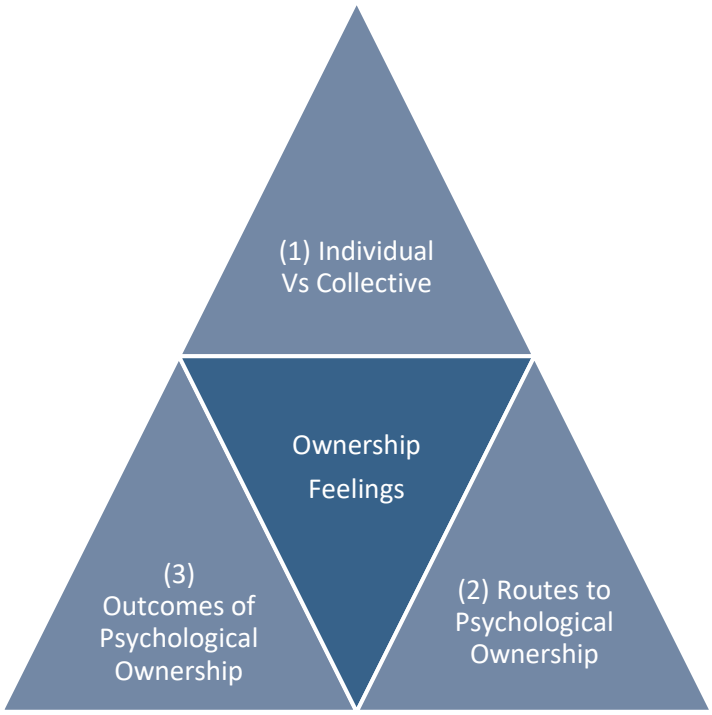


Figure 8 Themes from Interview Data Relating to Ownership Feelings.

These findings provide the foundation for proposing a series of hypotheses to be tested in the quantitative stage based on the themes that developed from the interview data, as well as reflecting on the literature and knowledge within the theory of PO. Therefore, in addition to presenting results of the qualitative data, this chapter proposes a conceptual model that reflects the theoretical arguments and is used as an instrument to guide the quantitative phase of the study. This framework is illustrated in section 4.6 when presenting the conclusions of this chapter.

4.2 Participants Profile Overview

Table 4.1 provides a background on the participants, outlining their demographic profile, the type of BEV they drive and their thoughts towards charging infrastructure in general. Following this the thematic findings from the data are presented.

Table 4.1 Profile Summary of Interview Respondents					
Interviews Number	**Informants Profile**	**Ownership Summary**		**Charging Experience Synopsis**	**Interview Time**
		BEV Brand and Model	**Ownership Synopsis**		
1	**Ahmad** (Male, 32 years old) lives in Swansea, South Wales and works as a Pharmacist for the NHS. He is married with children and chooses the environmentally friendly option wherever possible for his consumption choices. E.g., purchasing recyclable products goods.	**Tesla Model 3**	Owner of a BEV since July 2020 and this is the first time owning an EV. This car was bought has part of a lease agreement through the NHS work scheme. On average drives around 150 miles / week of which includes his commute to work which is 15 miles each way.	Ahmad usually charges his car at his parent's house as opposed to his own as the council won't permit him to install a home EV charger point due to space availability on his driveway. When charging publicly, tends to use InstaVolt due to their practicality, price and reliability.	63 Minutes
2	**Hussain** (Male, 62 years old) is a Doctor for the NHS living in Swansea, South Wales. He is married with 4 children and is an advocate for better air quality and energy conservation.	**Mercedes EQC400**	First time owning a BEV and has had his car since September 2020. The car was bought as part of the lease agreement for the NHS work scheme. Drives approximately 350 miles a week which includes his commute to work.	Hussain favours charging at home heavily relying on this to meet driving met. Avoids public charges due to inconsistencies surrounding payment and working condition (out of order / busy).	61 Minutes
	Stuart (Male, 48 years old) from		First time BEV owner and has had his car	Stuart relies on public charges as he is unable to install a home charger as his property does	58 Minutes

3	Monmouthshire, South Wales. He is business development director working in the automotive industry.	**Audi Q4 E-Tron**	since December 2021. Car is being leased through the company salary sacrifice scheme. He drives around 120 miles a week.	not have off street parking to charge his car. Considering relocating due to poor home charging options. Expressed much disappointment in charging infrastructure particularly around accessibility and speeds.	
4	**Bethan** (Female, 45 years old) from Brecon, Mid Wales. Works as a finance director. Has a passion for motor vehicles and motorcycles.	**Tesla Model 3 Performance**	Has been leasing the Model 3 from Tesla since September 2021 from Tesla. This is the 2nd BEV she has owned, the previously being a Tesla Model 3 also. On average drives around 60 miles / week of which includes commute to work roughly 4 miles each way.	Bethan relies on her home Tesla charger to charge her car. Expresses her comfort with the Tesla supercharger network regarding its convenience, time and reliability.	88 Minutes
5	**Daniel** (Male. 62 years old) from Pembrokeshire, South Wales. He is an IT consultant who lives a sustainability lifestyle in order to reduce waste as much as possible.	**Tesla Model S**	Been a BEV owner for 8 years using the same Tesla car throughout. Car was purchased outright and has driven on average 350 miles a week mainly for commuting.	Daniel tends to charge at home using his Tesla charger particularly overnight due to cheaper electricity rates but more importantly to offset the stress on the national grind to "reduce adding to the problem of high energy demand".	71 Minutes
6	**Jason** (Male, 42 years old) from Cardiff, South Wales. He is a Neuroradiology Consultant for the NHS.	**Lexus UX300e**	First time BEV owner since May 2021 but has prior experience with EV" s having previously owned a Toyota hybrid. The car was bought as part of the lease agreement for the NHS work scheme. Drives around 120 miles / week including commuting between the Cardiff and Bridgend area.	Jason mostly relies on his home EV charger without this he feels it would be challenging to accommodate his driving needs with public charging networks due to low recharge speeds.	64 Minutes
7	**Alex** (Male, 65 years old) from Cardiff, South Wales. He is semi-retired	**BMW i3**	Owner of a BEV since April 2021 where this is the first EV he has owned. Car was outright bought and drives about 80 miles a week,	Alex does not have a home charger installed due to high installation cost, he is accustomed to using the public chargers particularly	82 Minutes

	and is working part time as a sound engineer.		works mainly from home following COVID, but occasionally drives to work roughly 10 miles each way.	favouring InstaVolt for their reliability and availability.	
8	**Karen** (Female, 63 years old) from Cardiff, South Wales. She works as an Education Advisor and Consultant at Board level. Aims to own the latest innovations and technologies to enhance her lifestyle.	**Tesla Model X**	Has been a BEV owner for over 6 years with two different BEVs. Both cars being Tesla cars. Spoke highly about the brand expressing strong feelings of attachment towards Tesla. Her current car was bought outright and drives around 220 miles a week.	Karen does not have a home charger installed as off-street parking is restricted. Relies heavily on the Tesla Supercharger Network as it is free and reliable. Without this owning a BEV would not be possible.	81 Minutes
9	**James** (Male 58 years old) from Wrexham, North Wales. Works as a Senior Business Manager in the automotive industry.	**Hyundai Ioniq**	First owned a BEV 7 years ago, previously owning a Nissan Leaf. This is the 2nd BEV he has owned. Car was bought as part of a lease agreement from Hyundai. Has a weekly driving mileage of 140.	Ross has home charger installed from when he bought his first BEV and continues to use the same one to charge his car. However, having had 7 years of experience with public chargers, Ross expresses his satisfaction in terms of charging speed and availability with public chargers interchanging between public and home charging.	64 minutes
10	**Malcom** (male 55 years old) from Carmarthen, South Wales. He works as an insurance claims inspector. He is married with 2 children. Aims to use responsibility sources	**Kia E-Niro**	Owner of a BEV since March 2021 and previously owned a Toyota Prius Hybrid. Ownership is through a company salary sacrifice scheme. Drives around 160 miles a week.	Malcom has both solar panels and a home EV charging point installed. His decision to do so was heavily influenced by the environmentally benefit. Rarely charges using public chargers as he favours the convenience and cheaper electricity rate from charging at home.	76 Minutes

	products across his lifestyle.				
11	**Stephan** (Male, 55 years old) from Cardiff, South Wales. Works as a technician at university.	**MG ZE - EV**	First time BEV owner since March 2020. Car was an outright buy and drives approximately 130 miles / week of which includes his commute to work roughly 10 miles daily.	Stephan mostly relies on his home EV charger without this he feels it would be challenging to accommodate his driving needs with public charging networks due to low recharge speeds.	72 minutes
12	**Phoebe** (female, 46 years old) from Swansea, South Wales. Works as a speech and language therapist for the NHS. Married with 2 children.	**Audi E-Tron**	Owner of a BEV since December 2020 this is the first EV she has owned. The car was bought as part of the lease agreement for the NHS work scheme. Drives approximately 160 miles a week which includes his commute to work	Phoebe relies on using her home EV charger that was installed by Audi when he got the car. Expresses the convenience and ease of use to charge on demand helps reduce the feeling of range anxiety as the car is always ready to go.	55 minutes
13	**David** (Male, 44 years old) from Anglesey, North Wales. He is self-employed and works as an IT Consultant	**Renault Zoe**	Has been a BEV owner for over 8 years with two different BEVs. Both cars being Renault. Strong feelings of attachment towards the brand were expressed which stemmed from previous family car also being from Renault indicating brand loyalty. His current car was outright bought and drives around 100 miles a week.	David uses the home charger that was installed from when he bought his first BEV and continues to use the same one to charge his current car. Having had 8 years of experience with public chargers, David spoke highly of his satisfaction regarding the charging speed and availability with public chargers in his area and frequently uses public network and home charging when needed.	92 minutes
14	**Michael** (58 years old) from Aberystwyth, West Wales. He is retired after selling his paper copier business. Aims to own the latest innovations and	**Tesla Model S**	First time owning a BEV and his first experience of owning an EV, has had his car since March 2017. The car was bought outright. Drives approximately 100 miles a week.	Michael has a charger, solar panel and battery storage systems installed at home all from Tesla. He's invested heavily in the brand following his experience with the BEV. Michael expresses satisfaction in terms of charging speeds on availability with the	82 minutes

	technologies to enhance his lifestyle.			Supercharger network into changing between public and home charging.	
15	**Malik** (36 years old) from Swansea, South Wales. He is self-employed and owns an IT consulting business. Aims to own the latest innovations and technologies to enhance his lifestyle.	**Porsche Taycan**	Owner of a BEV since September 2019 where this is the first time owned an EV. The car was bought as part of a private business lease contract between Malik's business and Porsche. Drives approximately 250 miles per week mostly for commuting purposes.	Malik has a home charger installed and prefers to use this instead of public chargers due to cheaper electricity rates. Equally however, admires the GridServe public charging network and relies on using this away from home.	85 Minutes
16	**Joseph** (44 years old) from Llanrwst, North Wales. He is a consultant in the construction industry who lives a sustainability lifestyle by eating local produce and using renewable energies.	**Tesla Model S**	First time owning a BEV and has had his car since 2020 December. The car was bought outright. Drives approximately 170 miles a week which includes commute to work roughly 10 miles each way.	Joseph relies on using his home EV charger installed by Tesla and expresses without this the public infrastructure around North Wales would not suffice the journey's Joseph's needs to make to suit its work and personal needs.	74 minutes
17	**Yousef** (51 years old) from Swansea, South Wales. He works as a Surgeon for the NHS. He is married with 3 children and is passionate about reducing air pollution.	**Jaguar I-Pace**	Owner of a BEV since April 2020. The car was bought as part of the lease agreement for the NHS work scheme. Drives approximately 155 miles a week which includes his commute to work in Swansea and around South Wales approximately 20 miles each day.	Yousef mostly relies on his home EV charger without this he feels it would be challenging to accommodate his driving needs with public charging networks due to low recharge speeds.	60 minutes
	Khalid (31 years old) from Swansea, South Wales.		First time owning a BEV and has had the car since March 2020. The car was bought as part	Khalid has a home EV charger installed and often finds himself interchanging with public	55 minutes

	He works as a GP for the NHS. He is married with 1 child.	**Hyundai Ioniq**	of the lease agreement for the NHS work scheme. Drives approximately 150 miles a week which includes his commute to work	chargers to recharge his car as the range is not high <170 miles.	
19	**Sarah** (24 years old) from Llanelli, South Wales. She works as an interior designer and follow sustainability practises in her work and personal life.	**Hyundai Ioniq**	Owner of a BEV since May 2020 and her fist experience of EV owned. The car was bought as part of the lease agreement from Hunyadi, and she drives approximately 70 miles a week.	Sarah does not have a home EV charger installed as she resides in an apartment building. She expresses although the public charging infrastructure in south wales is suitable, she finds herself only using the same brand of chargers each time – Osprey chargers.	62 minutes
20	**Megan** (54 years old) from Neath. She works as a schoolteacher. She is married with 3 children.	**Audi Q4 E-Tron**	Owner of a BEV since December 2021 and previously owned a Volkswagen Passat Hybrid. Both cars were bought outright and drives around 110 miles a week.	Megan charges her BEV using her home EV charger which was installed by Audi and is powered using solar panels. She doesn't feel encouraged to rely on the public charging infrastructure as her previous experiences with them have either been out of order or in use for more than one hour.	68 minutes
21	**Rebecca** (36 years old) from Carmarthenshire, South Wales. She is married with 2 children and works as a Senior Children's Psychologist for the NHS	**Volkswagen ID4**	Owned her first BEV 4 years ago where she previously had a Renault Zoe. Since then, in November 2021 she outright bought the Volkswagen ID4 and drives around 80 miles a week including both commuting and personal journeys.	Rebecca does not have a home EV charger installed due to installation space issues. For this reason, she relies on public charging and tends her local supermarket EV charger.	56 minutes
22	**Jack** (28 years old) from Rhyl, North Wales he works has an	**Volkswagen ID3**	This BEV is his first experience of owning an EV and has had this since November 2021. Car is leased from Volkswagen. He drives around 200 miles a week.	Jack charges his BEV using his home EV charger which was installed by Volkswagen. Jack expresses without the home charger he	65 minutes

	environmental engineer for Atkins and is married.			would be unable to drive as EV given the poor infrastructure around the North Wales region.	
23	**Emma** (53 years old) from Bridgend South Wales. She works as a social worker for the government and choose the environmentally friendly option where possible for her lifestyle choices. E.g., purchasing recyclable products goods.	**Nissan Leaf**	First time of owning a BEV and also her first experience of EV ownership, this car was bought outright from Nissan in January 2021. She drives around 90 miles a week	Emma has a home charger installed and prefers to use this instead of public chargers due to cheaper electricity rates. However, admires the Ecotricity public charging network and relies on using this away from home.	57 minutes
24	**Christopher** (54 years old) from Rhayader, Mid Wales. He works as Senior Business Manager in the Pharmaceuticals industry.	**Tesla Model S**	Owner of a BEV since September 2020 and previously owned a Mitsubishi Outlander PHEV Hybrid. The Tesla was bought through a company salary sacrifice scheme. Drives around 520 miles a week mainly commuting to work.	James uses the Tesla Supercharger network more often than his home EV charger given he is commuting most of the week. Without access to a Tesla Supercharger, he feels the mid Wales region would not suffice his charging needs.	67 minutes

4.3 Sub Theme 1: Individual and Collective Ownership Feelings

Most participants expressed feelings of PO. It became apparent these feelings existed at both the **individual** and **collective** level. Coinciding with key terms used to illustrate, PO on at an individual level (IPO) participants consistently referred to their car as “mine”. In other words, the key word used to describe IPO as outlined by Pierce et al. 2003 “a piece of it is “theirs” (i.e., 'It is MINE!)” was consistently evident in this study suggesting that BEV owners can develop IPO towards for their BEV.

Moreover, participants also made remarks on feelings of ownership on a collective level by referring to other BEV owners and how they felt connected by sharing a common commitment and belief. This was evident as participants spoke about having feelings of CPO towards the BEV owner’s community i.e. this community is “ours”. Throughout the interviews, participants suggesting having feelings of ownership demonstrated by using phrases: such as “mine”, “my”, “us” and “ours” interchangeably. The following presents examples of the differences between how feelings toward IPO and CPO resemble in the context of BEV ownership.

4.3.1 Individual Psychological Ownership

Prior studies suggest IPO is most strongly felt with legally owned possessions, followed by rented and shared possessions, because in each state the routes towards IPO are impeded (Bagga et al. 2019). However, despite participants in this study being somewhat divided equally between those who outright bought their car (10 participants) and those who owned through a lease or salary sacrifice scheme (14 participants), feelings of IPO seem to be consistent throughout. In other words, it was observed participants expressed feelings of IPO towards their BEV regardless of ownership type. With that in mind, feelings of IPO were gauged by the emotional attachment participants showed towards their BEV when describing it.

For example, some participants recalled investing the self into their car by making physical modifications to incorporate part of their identity and personality so that the car becomes distinct, unique, and recognisable to the self. Karen for instance, mentioned because of the lack

of colour choices offered by Tesla she felt the most notable way to feel her car is “mine” and different to other Tesla’s is by adding decorations to her tires and have a private number plate.

“*It does have its own number plates. I've never had private plates, ever. So, part of that was Tesla’s mainly came in 3 colours which means everyone has the same looking car. I wanted to do something that would show that it’s my car especially when I’m at the superchargers…. One time I was charging, and a guy came over to me asking If I was Karen because I recognize my number plate and the rainbow sparkles, I’ve added to my wheels.*”

(Karen, Tesla Model X)

Karen ‘s remarks illustrate investment of the self into the car, one of the key routes of PO (Pierce et al. 2003). This was also the case for Michael, who stated that he purposely chose his car to be white as this reminded him of his former business, a paper selling and office supplier.

“The reason I went for white wine is twofold. One my dad used to have his first really nice car was a white Mercedes Benz back in 1985 and it was white. White car always reminds me of my dad. But also, white is the colour of the sheet of paper which made all the money that paid for the car.”

(Michael, Tesla Model S)

Stephan echoes these ideas by mentioning that he felt the need to place humours decal bumper sticker in order to express his personality to others and make his car more recognisable:

“I stuck a picture of a husky breaking free, so it makes people laugh and puts a smile on their face. So, for me when I spot my car across the car park, I can say that is not just any MG ZE 5, that was ***my*** *MG ZE.”*

(Stephan, MG ZE EV)

Several remarks made by participants who spoke about car names are worth highlighting as this offers additional insight on feelings of “mine”.

It was mentioned that because most user interfaces of BEVs as well as the car's smartphone application, there were several opportunities to give the car a name that most participants did. Interestingly, those participants who had not previously named their owned cars or in fact any other possessions, gave their BEV a name. Thus, reinforcing this idea of "mine" in connection with BEVs.

Table 4.2 IPO Evidenced Through Car Naming	
Participant	**Quote**
Michael (Tesla Model S)	*"When I went to Tesla, I never even thought that my Mercedes didn't have a name. And I said, well, it self parks. She's got full self-driving, how about Parker? I'm was a big fan of the show Thunderbirds, one of the main characters was Parker who could do exactly that!"*
Phoebe (Audi E-tron)	*"The boys have named it and stuck with E-tron which is turd in French. I was fine with it! Felt having a bit of a jokey name would help me get used to the changes in driving a BEV"*
Megan (Audi E-tron Q4)	*"I went with Blodeueddt which is a Folk Welsh lady. I always try to plant my identity and remember my roots I feel its important to"*
Bethan (Tesla Model 3)	*"Its called T'Challa, from the film Black Panther, And I really loved the movie it's the first time to see in a Marvel movie black culture being presented positive which was a big deal for me, It was a proud moment for me"*

4.3.2 Collective Psychological Ownership

Beyond IPO, feelings of PO were also shown on at a collective and group level. These feelings of CPO expressed by using "us" and "ours" echo the main theoretical foundations laid by Pierce and Jussila (2011) on CPO. These feelings were most notable when participants mentioned feeling connected with other BEV owners because of the common commitments made to own a BEV, but also the collective concern shown towards the natural environment. This sense of belonging captures the feeling that one belongs to a group and the sense of PO over it satisfies the feeling of 'having a place' and a sense of belonging (Jussilia et al. 2015; Pierce and Jussilia 2011). It was understood feelings of collectiveness arose from the social interactions BEV owners

made with other owners either through various online groups, face-to-face interactions at charging stations, or mutual agreement while driving. Alex and Phoebe demonstrate examples of this kind of bias:

"One thing that struck me with owning a BEV is how connected I feel to others. I am a member of the i3 owners and there's quite a lot of friendly chats and banter on the Facebook group. There is a lot of the stuff that is quite interesting and friendly. It is great talking to others who have the same driving experience as me. It's a nice feeling to know I can connect to others that share my interest and beliefs. I would go as far as saying there is definitely a sense of 'We' in all this."

(Alex, BMW i3)

"The EV community is just lovely. Everyone I've met has just been really friendly, it's quite easy to start a conversation with someone else's who is charging their car. I didn't think I would gain so much socially from owning a car. You do get the sense of belonging because we all share the same way of thinking. We all enjoy the idea of EVs and its environmental benefits and this is why we got one."

(Phoebe, Audi E-tron)

While almost all participants mentioned feeling part of a community of BEV owners, some owners extended this feel towards a brand specific group. Tesla owner participants in particular, highlighted feelings of CPO towards brand communities and excitement about being part of a collective. Impressively, all Tesla owners referred to the same online group: *Tesla Owners UK* group. This demonstrates that interactions with brand community members and developing strong feelings of connections with others through this is perhaps a key motive for feelings of CPO. Michael shared an intriguing insight into lengths that some Tesla owners would go to support each other illustrating social cohesion behaviour.

"The Tesla owners group very recently met up at Southampton for an incoming shipment of new Teslas vehicles. Imagine it was us the owners, that handed over the keys to the new owners congratulating them and showing them around their new car. This is why I love this community. Tell me one other car brand that would do that."

(Michael, Tesla Model S)

Michael continued by stating he feels that owning a BEV goes beyond just conventional driving and is much more about the interaction and togetherness you can gain from other BEV owners.

"The best part of Tesla ownership, without a doubt, are the other owners. Probably 80 friends. I never knew before I had a Tesla…have you ever bought a car and gone on holiday with somebody who happened to buy the same car? The sooner people are aware that owning a BEV is more than just a car but this whole togetherness, the sooner people will make the switch."

(Michael, Tesla Model S)

In a similar fashion, Karen praises the Tesla owner's community by suggesting this exclusive group is unlike anything seen with BEV owner groups of other brands. This idea is extended to suggest, that while Tesla owners view themselves as part of a larger BEV community, they also have a stronger bond with other Tesla owners.

''You being part of this group, there is some form of collective unit that you're all doing your best to support our environment and take care of our planet. We all know Tesla is the best electric car on the market. That is unique for us we own something that's a little bit exclusive to outsiders.''

(Karen, Tesla Model X)

In that regard, both Michael and Karen refer to Tesla and praise the brand for its engaging community and sense of supremacy suggesting some degree of tribal characteristic. It was interesting to find this behaviour was only notable with Tesla owners as opposed to other BEV brands suggesting the symbolic value and image of the brand holds a significant weight in how owners value ownership of a BEV.

To conclude, it was interpreted that feelings of ownership exists on a collective level evident by owners using words such as “us” and “our” when referring to other BEV owners and the wider BEV community. Hence, it is plausible to claim that in the context of BEV ownership feelings of PO may exist at both in an individual and collective level.

The following section presents the routes to PO, discussing the key antecedents that lead to these feelings of ownership to emerge.

4.4 Sub Theme 2: Routes to Psychological Ownership

This sub theme presents discussions on the antecedents that led to feelings of IPO and CPO in the context of BEV ownership. Interpretation of the data revealed when feeling in control over the various technology features of a BEV, this can instigate feelings of IPO. This echoes the arguments made by Peirce et al. (2003) that sense of control is a key route for feelings of ownership to emerge. Additionally, it was suggested knowledge gained about issues faced within the natural environment and choosing to behave environmentally responsible, i.e. owning a BEV instead owning an ICE car, also invoked feeling of IPO. This again echoes the arguments drawn by Peirce et al. (2003) regarding how intimate knowledge about a target drives feelings of ownership. Beyond just feelings of IPO emerging from environmental concerns, it became apparent that this also led to feelings of CPO. It was understood when BEV owners collectively recognise their efforts and concern towards the environment through ownership of a BEV, this motivates feelings of CPO to arise, which elucidates a community who share these beliefs.

The findings also postulate feelings of pride play a key role in the development of PO, both individually and collectively. As will become apparent further into this section, feelings of

authentic pride were mentioned by participants when discussing their emotions for feeling in control when interacting with the technology features of their car. In contrast feelings of *moral pride* were expressed as an outcome of environmental concern to highlight their achievements and efforts on an individual basis by owning a BEV or collectively by sharing these beliefs with other owners. The developments of each of these are presented as follows:

4.4.1 Consumer Technology Appropriation

One of the key routes established in literature that led to feelings of IPO was having control over the target (Peirce et al. 2003). It was interpreted because of the various technology features embedded within BEVs, feeling a sense of control over the technology enriches feelings of emotional attachment towards their car. This reflects the thoughts of Belk (1988, p.144) who proposed "we make things a part of self by creating or altering them." Hence, the interaction with the technology of their car caused the individual to "invest time, effort, and attention which causes the self to become one with the object and to develop feelings of ownership toward that object" (Pierce 2003, p. 302). The term *technology appropriation* was chosen to represent this behaviour as it describes "the way in which technology or technological artefacts are adopted, shaped, and then used" (Gaskin, 2013).

Appropriation of technology has been debated in conjunction with PO theory as evidenced by (Gaskin 2012; Kirk et al. 2015). However, since the studies were conceptual in nature, the propositions were not supported empirically. Hence, the findings from this study empirically confirm that having control over the technology features of an object drives feelings of IPO. Furthermore, the findings build on the work of Gaskins (2012) and Kirk et al. (2015) by demonstrating appropriation of technology can take place towards technologies that are both digital and physical in nature. The participants expressed feeling in control when using the plug-in to charge system and interact with their car through the smartphone application drives feelings of emotional attachment, which in turn activates feelings of ownership over their car. However, when participants mentioned using autonomous driving features such as self-parking this limits the feeling of being in control, as autonomous systems require no input by the user.

As a result, this impedes feelings of emotional attachment to develop. The following quotes illustrate the relationship between technology appropriation and IPO.

A) Plug-In to Charge System

Several participants (6) referred to the negative perception of charging, reiterating previous findings on range anxiety (Axsen et al. 2017; Halbey et al. 2018). However, because the act of charging a BEV requires the use, interaction, and understanding of the car's technology, it become apparent some level of control over the charging technology is needed .

Participants such as Rachel and David mentioned by understanding how to use the plug-in charge system and further how to optimise charging for the best output not only increases levels of confidence but, elevates the feeling of being in control over their car. Other participants such as Yousef and Malcom add to this and draw on the freedom to charge their car at various locations, such as shopping centres, place of work, and at home meant the need to understand how each charging station differs by operation and charging output. Consequently, this seemed to affect whether the owner felt capable of appropriating the BEV's technology and ultimately feeling in control.

"Knowing how the charging system works does help massively. It just removes the added fear you have when it comes to charging because you know what to do and know how to handle it when something goes wrong. For me I think it's important that I know how the technology bit works in my car because without it I would find it hard to be in control if you see what I mean."

(Rachel, Audi Q4)

"Because I know how to use the charging system it does make me feel I know what I am doing with my car. Owning an EV goes above just the driving stuff because it's quite important you know your way around tech as well. It's mainly because each place you charge might have a different way of being used and so you need to be aware of the different charges and the different apps that come with it."

(David, Renault Zoe)

"I didn't expect owning an EV would mean I be in control of so many things. When I decide to charge I can tell her exactly to what percentage to charge to. Even when I use the public chargers, got more choice as to where I want to charge and sometimes it's not even based on the location it's more about finding a charger that delivers 100% green energy. It has changed my ownership experience of cars."

(Malcom, Kia E-Niro)

Having said this, some participants expressed unable to feel in control over the charging system of their car. This was not because of reasons relating to range anxiety which indeed was the case for some participants prior to ownership, but rather charging anxiety. Although 17 of the 24 participants mentioned they usually charge their car at home, some degree of charge anxiety was evident which was mainly directed towards the public charging infrastructure. Hence, some participants found it difficult to feel in control over their charging when external obstacles such as charging speeds, operation status and availability were forefront concerns. Jason and Stuart express this kind of bias:

"I usually rely on my charger at home because I can plug it in and wake up the next day and I'm ready to go. I am not that keen on using public chargers because well.. I don't have any control over whether they will be working or not or is someone hasn't unplugged their car when its finished."

(Jason, Lexus UX300e)

"I would love to drive somewhere new and not have to look up the charging situation beforehand because sometimes you'll arrive at a charger that only uses a specific charging connection type which might not be compatible with the car. It can be frustrating not being able to control things like that. That was never the case when refuelling my petrol car."

(Stuart, Audi Q4 E-tron)

Feeling a sense of control over the plug-in charge system not only enhances the overall ownership experience, but also influences the levels of attachment the owner has with their car. Hence to what extent this aspect of ownership has on feeling of IPO towards their car remains unclear and requires further investigation.

B) Interacting with Smartphone Application

One interesting distinction between ICE cars and BEVs, is how manufacturers aim to enhance the ownership experience of BEVs by giving the owner another way to interact and learn about their car by using its complementary smartphone application. Features such as being able to control when charging starts and stops, preheating seats and window defrosting, monitoring battery range levels and tyre pressure were expressed as highly appreciative benefits of using the smartphone application.

Participants like Adam, James and Christopher suggested interacting with their BEV using the smartphone application not only helps them feel more in control over their car, but also strengthen the emotional attachment they have towards it.

"With the app itself, I can unlock the car, I can defrost my car on an icy day from home and even flash the lights in a silly fashion which is fun. I can use the app to tell the car to stop or start charging. You feel like you relate to it more I guess as you have control over everything. I feel like it's what should be the norm, or I guess what will be the future. I can see why now people get attached to their EVs quite quickly."

(Adam, Tesla Model 3)

The comments made by James and Christopher overlap with that of Adam by mentioning:

"The car has completely changed the way I drive. For instance, I'm able to type the destination of where I'm going on my phone and set it so that it's ready when I get in the car. I usually preload my favourite playlist for when I start my journey to work right from my app. I never imagined

being able to have this much input or control over my car without actually driving it. I know that most people get attached to cars and what not and now I am it seems I am one of them. Doing a lot of the things through the car app it's such a game changer."

(James, Hyundai Ioniq)

"The Tesla car app just elevates the whole experience. There is so much you can do. It's a shame we waited this long to include technology in driving. I think most people out there would be thrilled to get more control with their car and good it brings to your driving experience. I am kind of attached to my car everywhere I go because I can use the app anytime to check in."

(Christopher, Tesla Model S)

Having said this, some participants expressed an opposing view of this dialogue. Rebecca and Malik commented on the number of apps needed in order to access and use various charging stations. It was interpreted this frustration impedes the feeling of being in control over the technological features of the car, and as a result, owners find it challenging to draw emotional connections with their BEV. Rebecca and Malik offer an interesting insight describing this behaviour, and thus raising the question about how valuable is it to have an integrated experience between the car and the smartphone application such that feeling in control over its technology features can be achieved.

"I typically tend to avoid using public charges just because the inconsistencies between them and the stupid number of apps that come with it. I can't tell you how many different companies out there that do these charges everyone has a different app that I need to install!! Not to mention they are not always working either which is rather annoying. No one really warned me about this side to EVs I don't know like feeling I don't have a say in what I want my car to do it's the opposite of what I was looking for."

(Rebecca, VW ID.4)

"The one thing that put me off using the public network is how many different app I need on my phone. I have a folder full of these apps dedicated to charging and sometimes I have to add a payment method to each one it's just so off putting. I find it baffling manufactures add these restrictions to the owner, I can't control how many apps I need or whether they will be working."

(Malik, Porsche Taycan)

C) Autonomous Driving Features

Thus far it has been evident appropriating technology has an impact on the development of IPO. However, since one of the novel and exciting technological features of BEVs is autonomous driving, it means consumers do not need to directly interact and control this technology. This is important given that one of the fundamental routes to PO is a sense of control, and with autonomous systems there is a reduced required extensive physical interaction from the individual (Puntoni et al. 2021; Longoni and Cian 2022; Smith et al. 2022). Hence, this has the potential to impede the development of feelings of ownership. Features such as automatic transmission, self-parking, and self-driving capabilities are common in BEVs and have been referenced by participants.

Interpretation of the data suggests when participants spoke about autonomous features, some seemed keen to use it while others tried to avoid it. Interestingly, the participants who mentioned avoiding these features recalled that the lack of control and understanding of the technology system is a major factor. Consequently, they mentioned feeling distant from their car when found using some of the autonomous driving features.

The following quotes are examples of this kind of bias where both Rebecca and David describe their early doubts of moving from manual gear transmissions to automatic transmission echoing these thoughts but also mentioning the impact this has on their driving confidence:

"I wasn't too keen on automatic transmission to be honest, not being able to choose the gear I want to be in does sit right with me. I don't feel I have an input. I didn't feel like I was the one driving it's like someone else is doing it for me."

(Rebecca, Volkswagen ID.4)

"Well adapting to an automatic was a bit strange at first, I've had manual [transmission] for about 30 years so naturally I felt in control of my driving because I can dictate how to drive. Now I don't feel that much at all, makes me feel less confident in a way."

(David, Renault Zoe)

Other participants noted how the self-parking system or fully automated driving might have seemed exciting at first, but in fact the lack of input and control over the technology and how to use it restricts their interaction with the car. This overlaps with the conclusions drawn by Smith et al. (2022) in that autonomous technologies seem to decrease feelings of ownership.

"There were lots of new things that came with the car, and I was a bit nervous to use it. Like the assisted parking you know the one where it parks itself. It's a bit uneasy sitting down and seeing your car just move and not having a clue what's happening. I don't feel comfortable that I'm not control. What if it crashes, is it my fault?"

(Hussain, Mercedes EQC400)

Bethan suggests because the system operates independently, without requiring extensive physical interaction, it is difficult to invest the self into it (effort or interaction). Hence feelings of ownership over the car are in effect non-existent.

"So, I've used tried to use the drive system but it's just too scary for me, not being able to touch the wheel or anything is frightening feel like I'm on high alert all the time!"

(Bethan, Tesla Model 3)

Similarly, Alex recalls his frustration with his BEV because of the automation of the car. It was understood that this causes a psychological disconnect between Alex and his car as he does not feel in control over some of the features within it:

"You can't just reach down and grabbed the right knob and control it without taking your eyes off the road. And I think that is a step backwards. Now I know obviously cars are very sophisticated, got loads of features and you can't have a knob for every feature. So, I feel the ones that you control while driving should all be their physical knobs. Recently actually I was trying to do some things whilst driving and it was driving me nuts. I couldn't even manage it whilst stationery with just the car switched on. I couldn't find how to do things. And its ergonomic nightmare as far as I'm concerned".

(Alex, BMW i3)

It is evident from these discussions and quotes relating to technology appropriation that further investigation and understanding of this and feeling of IPO is needed. The discussion above posits the following hypotheses that would be suitable for testing in further quantitative research:

- **H1A:** Consumer technology appropriation positively impacts IPO when the individual feels in control when using the charging system in their BEV.

- **H1B:** Consumer technology appropriation positively impacts IPO when the individual interacts with their BEV using the smartphone application.

- **H1C:** Consumer technology appropriation negatively impacts IPO when the individual uses the autonomous driving features.

D) Authentic Pride

A notable finding that surfaced frequently in relation to appropriating technology related to feelings of achievement and competence for their ability to interact and use various technology features. This positive emotion is understood as pride, corresponding to the efforts made towards using the technology successfully. This form of pride was authentic in nature, as it seemed to transpire as part of an evaluation of the self and expressed privately (Tracy et al. 2007). As discussed in Chapter 2, authentic pride is associated with feelings of success and accomplished enhancing self-esteem.

It was understood that as BEV owners engage and appropriate various technology features, this drives feelings of success and accomplishment, reflecting a cognitive evaluation of successfully appropriating various technological features of their car. In doing so, it elevates the feeling of being in control over their car, a key route to the development of IPO.

This finding responds to the propositions of Kirk et al. (2015) who suggested feelings of authentic pride towards a target leads to increased feelings PO over it. However, it is important to note, since interaction with autonomous driving features seems to decrease feelings of IPO, the effect of authentic pride on this relationship should have no impact. Thus, the following quotes present how authentic pride seems to be related to consumer technology appropriation when; using plug-in to charge system and using with the smartphone application to interact with the car.

"Being proud of my car is one thing but something I've noticed recently was feeling proud about being able to navigate all the tech in the car especially with the many updates I've had over the last few months. Before getting my car, I wasn't really into tech that sort of gone away now I've got an EV. I am quite proud of my car in that sense yeah."

(Malcom, Kia E-Niro)

"The new tech for me wasn't such a big deal because its big part of my job anyway. But I do feel quite proud of the fact I can use my car to its full potential because I understand how to get the best out of the technology. Yeah, the feeling of accomplishment is quite nice."

(Malik, Porsche Taycan)

Similarly, Megan and Yousef spoke about how they felt proud to overcome personal challenges with technology usage, which resulted in feelings of authentic pride:

"I was warned by a few others that you need to be comfortable with using tech regularly if you are going to own an EV. I wasn't really prepared at first but after some time I got very comfortable with the charging and all the different apps and the touchscreen stuff as well. Yeah, I'm very proud of myself for that."

(Megan, Audi E-Tron)

"One of the big challenges I faced when getting my EV was how was I going to get around learning the technology stuff because well it's the car of the future? That's what people say right? I became aware that I needed to get to grips with tech and for the first time either. Honestly it was the best decision I made. The technology is fantastic. I didn't think I would handle it all but I feel quite good about myself for showing that I can do it. In that sense I am pleased with myself for overcoming my worries I used to have with technology."

(Yousef, Jaguar I-Pace)

Based on the remarks made about authentic pride and technology appropriation, it is logical to hypothesise the following:

- **H2A:** Feeling in control when using the plug-in to charge system and smartphone application to interact with the BEV positively impacts IPO through the mediating role of authentic pride.

4.4.2 Environmental Concern and Feelings of Ownership

In addition to technology appropriation acting as a key antecedent to IPO, it was understood environmental concern also plays a role in the development of feelings of IPO. Interpretation of the data suggests being concerned towards the natural environment not only instils feelings of IPO over their car, but drive feelings of CPO over the BEV community as collectively owners share a common commitment and belief that "us" owning a BEV represents "our" concern towards the natural environment. Environmental concern describes the awareness and concern individuals have about the natural environment and the impact of human activities on it (Sajjad et al. 2020). The concept of environmental concern has garnered academic attention to better understand consumer behaviour aligning with the increase consideration shown towards rise of environmental ethics (van der Werff et al. 2013; Sajjad et al. 2020). The findings suggest that emotional investment and IPO towards their BEV surfaces from intimate knowledge gained about the consequences of damaging the natural environment. This therefore reflects the foundations of PO theory stating individuals who acquire knowledge about a target are more likely to feel a sense of PO over it (Peirce et al. 2003).

These remarks regarding knowledge gain towards the environment echo several discourses offered by (Süssenbach and Kamleitner 2018; Peck et al. 2021; She et al. 2022; Wang et al. 2023). These scholars argue when individuals hold feelings of ownership towards their natural environment, this not only should lead to them behaving environmentally responsible towards it and hold feelings of PO over it, but also feelings of ownership with the objects affiliated with it. In the case of CPO, owners collectively signal to each other and to those outside their group (i.e

non-BEV owners) the positive action taken towards caring for “our” environment (decision to own a BEV) which drives feelings of CPO. In other words, feelings of CPO reflect a collective belief of “we should take care of what is ours”. The rationale behind this proposition rests on Belk (1988) arguments that ownership of an object (i.e the natural environment) reflects part of the extended self and, thus the consequences of neglecting the environment or taking positive actions directly affect oneself. Thus, individuals may develop emotional connections with their BEV or with the wider BEV owner community as nature is perceived as belonging to themselves or a collective. The data suggested environmental concern was referenced by first describing feelings of attachment towards the natural environment and then extending this by either describing feelings of assumed responsibility or moral obligation to preserve and care for the natural environment.

The origins and debates on inner moral obligations feelings and assumed responsibilities towards conserving the natural environment is well document in consumer research (Sparks and Shepherd 2002; Martinez and Jaeger 2016; Yaprak and Prince 2019; Li et al. 2022; Kumar et al. 2023). Together these self-evaluated concepts capture the individuals personal environmental norms and the self judgment made to take accountability for their decisions and action concerning the natural environment (Babcock 2009). Moral obligation refers to the ecological conscious behaviours an individual portrays towards the natural environment and the impact this has on engaging in green behaviour (Kumar et.al 2023). While the assumed responsibility is described as taking action towards protecting the environment without being promoted to do but rather self-acted in accordance with inner beliefs. (Evans et al. 2017). It was interesting to note that majority of the participants framed their responses about their emotional connection towards the natural environment through ownership of a BEV by referring to these two concepts In other words, participants seemed to describe feelings of ownership at both the individual and collective level by using phrases such as “morally right”, “my responsibility ”, “my environment”, or “our environment” or “our responsibility”.

A) Assumed Responsibility

Most participants mentioned feelings of ownership and attachment to their car seemed to stem from having some form of assumed responsibility to care for the natural environment. That is to say, referring to the natural environment as a responsibility of "mine" or "ours". Thus because of this assumed responsibility to take care of "mine" or "our" environment, owners draw an emotional connection with their BEV as this symbolises these norms and portrays a clear message which convey these feelings of responsibility. David for instance mentioned:

"I feel quite strongly about being considerate and empathetic about our actions to our environment and I wanted to make a statement to myself and to others around me. I would go as far as saying yes, I do I feel I own part of the environment around me because well I have spent a lot of time camping and exploring so I recognise the duty of care. I should be protecting my environment in that sense… that's why I love my car so much it. It echoes who I am on a personal level, we both share the same values. That's why it is easier for me to relate and connect to this car more than the others I have owned in the past."

(David, Renault Zoe)

Hussain draws similar remarks suggesting feelings of attachment and PO towards his car stem from the assumed responsibility he feels towards "my" environment:

"Where I live locally and other places around Wales are really important to me because this is my home. So yes, I do feel responsible in the way of making sure the environment has not been damaged and that my kids have a future to live in. So, my car for example it's just my way of showing that I am aware of my actions by driving a petrol or diesel, but I have acted on my responsibility by not emitting dirty toxins."

(Hussain, Mercedes EQC400)

These feelings of assumed responsibility have also paved the way for feelings of CPO to develop. Participants shared how feelings of CPO towards the BEV owner's community emerge when recognising how together they represent a group of individuals who deliberately chose to commit to their feelings of responsibility. Karen and Jason show example of this kind of bias:

"As an owner of a BEV you are showing you are involved with your environmental surroundings and that you care towards it. You feel you are being part of an environmentally friendly group and there's this collective understanding we are all doing our best to support our environment. It's fair to say we are all trying to do our bit together by choosing to drive electric and that is what draws us together. We choose to be part of this, this is our way of living that all of us are collectively part of a group that supports the environment."

(Karen, Tesla Model X)

"You start noticing that green line on reg plate of these electric cars. You notice that you feel you relate to these people somehow. I think as a group we are making a positive difference and hopefully encouraging others to follow. You don't really have to know the other person there is this feel that we together are trying to do good for the environment around this. My car just plays a small role in that but as group our effort is what makes the big difference."

(Jason, Lexus UX300e)

One noteworthy remark made by Ahmad who mentions because of these feelings of responsibility he is much more mindful on how much energy is needed to power his car.

"I do think about the fact when I am driving a Tesla I am thinking about the environment. Because for me and some of my friends we feel responsible for how much energy we are using to get to a certain place."

(Ahmad, Tesla Model 3)

B) Moral Obligation

Participants continued to express their emotional attachment towards their natural environment by sharing how their moral considerations to preserve and care for the environment shapes their ownership experience. Participants indicated that emotional attachment to their car stems from their beliefs of taking the right action towards "my" natural environment. To add to this, on a collective level, participants drew on the wider BEV owner's community and how together ownership of a BEV represents shared feelings of moral obligation that together we are taking care of "our" natural environment.

"I feel more attached to this car than I have previously. It started because I feel it is morally the right thing and lowers my carbon impact on the environment because I care about where I live and what my kids are breathing. I've lived in Wales for over 30 years this is my environment, my home I want the best for it. So, you know I share these feelings just like many other EV owners. I am proud that my car is part of the solution in caring for the environment.''

(Daniel, Tesla Model S)

Daniel highlights the view shared by most participants who believes it is his duty to care for the natural environment around him. He feels strongly about protecting and nurturing "my" environment and so developed strongly feelings of attachment towards his BEV as his car symbolises his beliefs. Similarly, Malik also feels IPO towards his car following the knowledge gained on how to preserve "his" environment but from a religious perspective. Thus, his attachment to his car is grounded on his moral beliefs and how his car reflects these feelings.

"As a practising Muslim, we are taught that the environment around us must be taken with care and that we should feel a degree of responsibility and duty of care towards it. Because of this I take pride in fulling my obligation of being environmentally responsible. I feel that my I have grown to love my car because it represents the level of care, I have towards my environment".

(Malik, Porsche Taycan)

In relation to collective feelings of ownership, it was interesting to learn participants do not necessarily need to know each other personally as there is a collective acknowledgement and understanding that owning a BEV shows that together "we" are taking care of "our" environment. Ahmad and Emma demonstrate this viewpoint:

"Owning an EV is such an insightful experience. I think it goes beyond simply driving a car. There is real sense of community amongst us. I feel myself and other others do share similar values and morals in that we care for the environment as to protect it for future generations, and I think us buying an EV is our way of saying that together we have acted on our responsibility for our actions to make changes to live a sustainable lifestyle."

(Ahmad, Tesla Model 3)

"We talk about this a lot in our group meets up that take place every month. Beyond a sense of togetherness there is a general consensus we have interest in each other because of we believe it is the right thing to do to care for our environment. Our cars show that we have a moral consciousness to do the right thing. I know at the end of the day it's only a car but this community given me the feeling I am part of a special group of people. I wish others saw this side of owning a BEV."

(Emma, Nissan Leaf)

Thus, it is appropriate at this point to suggest following hypotheses that would be suitable for testing in further quantitative research:

- **H3A** BEV owners who express feelings of attachment towards the natural environment instigate feelings of IPO towards their car.

- **H3B** BEV owners who assume a sense of responsibility towards preserving the natural environment instigate feelings of IPO towards their car.

- **H3C** BEV owners who feel a sense of moral obligation to take care of the natural environment instigate feelings of IPO towards their car.

- **H3D** BEV owners that collectively share feelings of attachment towards the natural environment with other BEV owners develop feelings of CPO towards the BEV owner's community.

- **H3E** BEV owners that collectively share a sense of responsibility towards preserving the natural environment with other BEV owners, develop feelings of CPO towards the BEV owner's community.

- **H3F** BEV owners that collectively share feelings of moral obligation to preserve the natural environment with other BEV owners, develop feelings of CPO towards the BEV owner's community.

C) Moral Pride

Adding to the previous discussions on environmental concern, interpretations of the data revealed that in a fashion similar to how technology appropriation stimulates feelings of pride, environmental concerns also provoke feelings of pride. However, unlike authentic pride which reflects feelings of success for appropriating technology, this facet of pride is related to the moral beliefs and values towards environmental concern, as put forward by the individual. This form of pride expressed privately, relates to the perception of genuine altruistic motives and emerges as a result of behaving in accordance with moral beliefs (Etxebarria et al. 2015; Williams and Davis 2017). Moral pride rooted in the individuals sense of ethical accomplishment was understood to be a powerful motivator to catalyse the relationship between environmental

concern and ownership feelings. It was understood that when participants felt moral pride, this emotion helped foster positive self-image and reinforcing a sense of personal integrity allowing them to connect with their car at a deeper emotional level, hence perceiving it as “mine”. The presence and role of moral pride was also recognised in relation to feeling connected with other BEV drivers. This group level moral pride emotion surfaced as BEV owners reflects on the collective altruistic behaviour to preserve “our” environment.

Hussain is a prime example of most participants demonstrating, how feelings of moral pride are connected to having of IPO over his car:

‘’My car makes me proud knowing I am fulfilling my values and moral reasons that we should be reducing our consumption and waste to save our planet. Really proud by that.’’

(Hussain, Mercedes EQC400)

Hussain goes on to mention:

‘’I think that I'm trying to say, in spite of this car being even more expensive to lease than others, I’ll still want to go for it because I know Electric Car is overlapping share the same beliefs and values, I have which is being eco-conscious as possible.’’

(Hussain, Mercedes EQC400)

The discussion posited by Hussain was echoed by Daniel, who identifies as an environmentalist and described why he feels connected to his car on a personal level. Daniel credits his altruistic motives for owning a car that brings benefits to the national environment while simultaneously illustrating his lifestyle choices. Hence driving feelings of moral pride.

''I do find a great deal of attachment with my Tesla. I see my car part of who I am because my car is evidence that I'm carrying out what I feel is responsibility of taking care of the environment. So naturally I do feel proud in that sense not just what the car represents but also proud of myself and my actions and expressing my beliefs".

(Daniel, Tesla Model S)

From this statement it is evident that feelings of moral pride are not only present among BEV owners but also have a positive impact in the development of feelings of IPO. On a collective note, Malcom shares how feelings of moral pride do seem to play a role in his feelings of CPO emerge:

"I'm quite active on a few EV owner group and most new people that join share a photo of their new car and comment on how proud they feel for the goodness they're doing to the environment. Other members then congratulate them and welcome them, and it goes to show that as a community we get excited when people are pleased, they have also taken the right steps in caring for the environment. Apart from all of us owning EVs which is great I get the impression a lot of us coming to these groups feeling really proud of themselves and so it's easy to connect to each other early on that way. I guess it speaks volume to how mutual everything is".

(Malcom, Kia E-Niro)

The discussion posits the following hypotheses that would be suitable for testing in further quantitative research:

- **H4A:** Feelings of moral pride mediate the positive relationship between BEV owners who express environmental concern and feelings of IPO towards their car.

- **H4B:** Feelings of moral pride mediate the positive relationship between BEV owners who collectively share feelings of environmental concern and feelings of CPO towards the BEV owner's community.

4.5 Sub Theme 3: Outcomes of Psychological Ownership

The third sub theme which was developed from the data, reflects the various consequences and outcomes of developing feelings PO both at an individual and collective level. This contributes and builds on prior consumer research concerning PO and its outcomes (Peck and Shu 2018; Peck and Luangrath 2022) showing both IPO and CPO can co-exist in the same settings and result in the same three outcomes within the context of BEV ownership.

First, the data suggests the mere feeling of ownership at both an individual and collective level, influences how an individual perceives the self. That being, when holding a strong emotional attachment towards the car or the BEV owner's community this affects the self-concept namely through self-identity as respondents shift their language from "mine" to "me" or "ours" to "us". Second, it was interpreted feelings of ownership whether individually or collectively serve as a catalyst to engage in positive word-of-mouth to share the experience of owning a BEV and enhance the image of BEV owners. Finally, it was understood feelings of IPO and CPO resulted in a higher product satisfaction of owning a BEV and an increased likelihood of choosing a BEV for their next car. The findings also posit the feelings of pride play a key role in PO outcomes PO, both individually and collectively. Unlike feelings of private pride (authentic and moral), which

were evident in the development of PO, feelings public pride; *hubristic* and *collective* pride emerged within the outcomes of IPO and CPO. The development of each of these are presented across chapters 4.5.1 to 4.5.4.

4.5.1 Activated Product Related Identity

One of the primary outcomes of PO debated in literature is how feelings of ownership can lead to a psychological state of 'activated product related identity' (Weiss and Johar 2013; Chung and Johar 2018). This describes how ownership of a possession can cause individuals to establish integration of the self (Ye and Gawronski, 2016) and assume an identity that aligns with the characteristics of that possession. This concept encompasses the individuals self-evaluation and their reflection of self-perception towards their possessions (Wheeler and Bechler 2021). For instance, an individual who owns a skateboard and has gained control over how to ride successfully may perceive it as "mine", illustrating emotional investment and feelings of ownership, thus activate an identity to reflect this behaviour i.e 'I am a skater'. Indeed "ownership helps people define themselves, express their self-identity to others, and maintain the continuity of the self across time" and hence the consequence of PO on outcomes will be strengthened when the individuals can relate their self-identity with the target (Pierce et al. 2003 p.89). This phenomenon was evident in the data where participants reflected on how the identity of their car, as well as the collective identity of the BEV owner's community as an outcome of their feelings of ownership towards them.

A) Individual Level

It was noticed participants shifted from expressing feelings of "mine" towards their car to feelings of "me" when drawing on identity related matters. In short, participants suggested ownership of their BEV does influences how owners perceives themselves. This is because ownership (what is "mine") is associated to and can activate the personal self (who is "me") (Weiss and Johar 2013). In reference to IPO, many of the participants mentioned how because of the emotional attachment they have towards a car it is easy to derive an identity based on the

characteristics of that BEV. Megan shows an example of this bias who makes refers to how prior to owning a BEV, others perceived her as someone who does not interact with much technology as part of her lifestyle. However, this perception changed once she began deriving and portraying an identity, this being 'tech savvy', to mimic the technological characteristics of BEVs.

"Because of my age a lot of people tend to assume I don't know that much about technology or how to use it but that all went away when I got an EV. I think a lot of people saw how much I've grown attached to my car and talk about it and they can see what impact it had on what type of person I am now. Using tech regularly is part of me now and I think others respect me more in that sense".

(Megan, Audi Etron Q4)

Rebecca and Alex also mention because they feel the car is "mine" is helped elevate their identity to reflect their "me" side which is focused on being an environmentally conscious individual.

"My relationship with the car is completely different to that I've had in the past. It is the first car I feel is truly mine because how I connect to it on different levels. Because of my ID.4 I see myself as a green consumer who is environmentally conscious. That probably wouldn't have happened if I didn't have those feelings towards my car in the first place".

(Rebecca, VW ID.4)

"Since owning this car I do feel it has signalled my character to people that I know and people that don't. Which is I believe we should go about our lives in a way that looks after and helps other people. I think a lot of this comes from the relationship I have with my car. I am well aware that it is my car but it's become a fact that it has changed me as a person, my sense of identity."

(Alex, BMW i3)

From the quotations above, it appears that activation of an identity does surface as an outcome of holding feelings of "mine" towards their BEV. The participants highlight they are able to connect and relate to their car both on a me "mine" and "me" level. The following discusses how this unfolds on a collective level reflected by feelings of "our" and "us".

B) Collective Level

On a collective note, participants pointed out that the feelings of togetherness and collective ownership felt with others create an identity that reflects the symbolical achievements and commitments of that group. This finding echoes the conclusions drawn by Ledgerwood et al. (2007) and Szamatowicz and Paundra (2019) that group identification is rooted in group-level attachment.

Participants like Joseph and Christopher suggest because they invoke collective feelings of ownership towards the BEV owner's community, this forms an image that illustrates the collective effort in being environmentally responsible.

"I do feel that because I am quite involved with other BEV owners in the group and also tend to talk to a lot of people who are also charging the car as well that we do feel we identify differently to those who don't own a BEV. I know for some it's just a car but for us as a collective we are those that are environmentally responsible on the road that is who we are".

(Joseph, Tesla Model S)

It is clear whilst Joseph feels his presence and involvement with other BEV owners creates feeling of ownership towards "our" community, it also publicly signals the intentions of the group and their positive actions taken in response to environmental concerns. In a similar fashion, Christopher noted because Tesla owners feel they are part of a more exclusive community than other BEV owners because of the brand, this collective recognition among the group members that Tesla BEVs are more technologically developed than others help spark a collective identity that "we" are Tesla owners, and this is what "we" are about.

"Being a Tesla owner is really really cool. You get this collective sense of belonging that you are first amongst those that decided to get it an EV but also those that belong to the Tesla owner's community. A lot of us really believe that we have the better EV on the road and it's largely due to the technology that Tesla comes with. It's funny I identify myself as a Tesla owner but also as somebody who is quite tech savvy because of that".

(Christopher, Tesla Model S)

The discussion above posits the following hypotheses that would be suitable for testing in further quantitative research:

- **H5A:** BEV owners who experience a high level of IPO towards their car are more likely to relate their self-identity with their BEV into their self-concept, leading to a stronger sense of identity.

- **H5B:** BEV owners that hold collective feelings of psychological ownership towards the BEV owner's community, are more likely to echo the collectively identity observed with their self-identity, leading to a stronger sense of identity.

4.5.2 Word-of-Mouth

Another consequence of feeling PO that appeared from the data at both an individual and collective level, is word-of-mouth. This finding is similar to prior studies that finds PO towards products increases in word-of-mouth as a way to convey self-enhancement (Peck and Su 2009; Fuchs et al. 2010; Kirk et al 2015). Word-of-mouth can be described as an individual to individual conversation of sharing personal experiences and opinions about a target rather than hearing about the matter through formal advertising or marketing channels (Lisjak et al. 2021). Ownership of a car does often result in word-of-mouth as individuals strive to show

connoisseurship as a way to demonstrate they are experts and with that seek appreciation (Engel et al. 1969; Hawapi et al. 2017; Setiawan 2018; Lisjak et al. 2021). In general, it was understood word-of-mouth particularly that which is positive, is motivated by the idea that this behaviour satisfies the need for self-enhancement (Fuchs et al. 2010, Lisjack et al 2021). In other words, word-of-mouth can be a consequence of PO as individuals have a tendency to share information and experiences about possessions or targets to which they have grown attached to (Fuchs et al. 2010; Alexandrov et al. 2013).

The findings also reveal for the first time that CPO can lead to word-of-mouth. The difference between word-of-mouth occurring at an individual or collective level, is how this informal communication style stemming from IPO is associated with the BEV specifically and the satisfaction gained for owning and driving it. Whereas when participants mentioned word-of-mouth as a result of collective feelings of ownership, this was directed at the commitment, social interactions and social recognition for being among those who own a BEV. The following illustrates this unfolding at an individual and collective level:

A) Individual Level

Ahmad and Hussain demonstrated the reason they spread positive word-of-mouth about their BEV stems from their feelings of attachment shown towards it which in itself motivated by the unique characteristics of BEVs.

"I really do love this car more than I've loved any other car that I've owned. I'm constantly telling other people about it and how they should make the switch when they can because they won't regret it. One of the reasons why I keep going on about it is how much I've grown into the car like I feel this car is really part of my lifestyle now it's definitely elevated who I am as a person."

(Ahmad, Tesla Model 3)

"Never really spoke about cars to other people because I thought they were all the same. But after getting an EV I can't stop talking about it. It's a very interesting way to own a car if you didn't feel bonded to one before I am sure you will after this! I do speak to a lot of work friends to convince them that they should just get one they're really that good."

(Hussain, Mercedes EQC400)

Similarly, James mentions because of the feelings of ownership and emotional attachment he has towards his car, he feels the need to communicate this with others and invite them to experience what ownership of a BEV is like:

"*I do tend to talk about my car a lot to be fair. It's all positive things and usually about how easy it is to drive and the amazing technology it is packed with. I never spoke so highly about my other cars to others because I wasn't so attached to them. I know this is just a car but to me it has become personal its 'mine', This car has really changed me, and I didn't expect that.*"

(James, Hyundai Ioniq)

B) Collective Level

On a collective level, it was understood that participants who noted they had developed a sense of CPO are more encouraged to spread positive word-of-mouth. This was implied by participants like Michael and Stephan, who indicated because ownership of a BEV makes them feel part of a wider group who are positively benefiting the natural environment, which should be communicated to others to motivate them to join this behaviour.

"One thing that's quite nice about feeling part of the EV community is that it gives you something different to talk about your car when speaking to others. Usually when others ask me about the car, I say one or two things but say a lot more about the community and the collectiveness I feel that I'm part of."

(Michael, Tesla Model S)

"I do get people stop me and ask about Electric Car is usually when I'm charging at supermarkets. I do talk about how many friends and lovely experiences I've gained from owning an EV and that's because you really do feel part of a group of people that are A) driving something great and B) understand each other as a collective that we are changing the planet for the better."

(Stephan, MGZE EV)

The discussion above posits the following hypotheses that would be suitable for testing in further quantitative research:

- **H6A:** BEV owners who feel high level of IPO towards their car, are more likely to speak positively about their ownership experience through word-of-mouth communication.

- **H6B:** BEV owners who share collective feelings of psychological ownership towards the BEV owner's community, are more likely to engage in word-of-mouth communication to promote and praise the collective commitments and efforts made.

4.5.3 Product Satisfaction

Feelings of product satisfaction were strongly suggested by the interviews. All participants made remarks on how much they enjoy, value and appreciate owning a BEV. This result is consistent with Fuchs et al. (2010), Li and Atkinson (2020) and Smith et al. (2022) arguments on how PO can be a powerful driver of product satisfaction motivated by having a sense of emotional attachment and possessiveness towards a target. Participants generally spoke highly of their respective BEV, pointing out the various features of their car that they are satisfied with. The most common features are related to; ease of driving as compared to ICE cars, forward-looking and innovative features (e.g., plug-in to charge) and awareness of their sustainable and environmentally responsible impact. Interpretation of the data revealed satisfaction with their BEV was more apparent when perceiving the car as "mine". Expanding on these ownership

feelings, the responses offered indicated that feelings of CPO can also result in product satisfaction based on gratitude for being part and feeling a sense of belonging with the BEV owner's community.

A) Individual Level

Ahmad, Bethan Malik, and David highlighted that because they felt connected to the car on a psychological level, they felt more engaged and appreciative of their car and its features.

"For me I love my Tesla I wouldn't want to switch to another car for quite a while and if I do it will definitely be another Tesla. I do feel there's something special about my car and I've noticed that by how I feel when I'm drive home, when I look at it, and how often I wash it as well! I feel quite connected to my car which is a bit strange to say but it does mean a value and appreciate it more!"

(Ahmad, Tesla Model 3)

On a similar note, Malik draws on his emotional attachment with his car and the corresponding feelings of IPO that rise with it which helps boost his satisfaction with his BEV.

"Yes, I've been quite happy with the cars I had in the past but this [Porsche Taycan] is different for me. I'm really pleased with it. The car is packed with tech, and I am aware of the good it does for the environment. It's a bonus it reflects the effort in and hard work I have made to get this car and I get the sense that it's part of me and how I see myself, a guy who loves technology but also feels partly responsible to do his bit for the environment.''

(Malik, Porsche Taycan)

B) Collective Level

On a collective note, as exemplified by Michael, Stephan, and Karen feelings of CPO towards the BEV community were pointed out as a key aspect of being satisfied with their car. That being, those that felt connected with other BEV owners and recognise a sense of "ours" and "us" value

and appreciate the car more because of how BEVs catalyse the social opportunities to interact with other owners. Michael for instance states:

"It is because of my car that I got to meet so many different people. For those looking to get an EV I always tell them how fantastic they are but really emphasise on the wider collective side of things and how us owners feel a part of something special. Without my car I wouldn't experience this social side of "we" when it comes to EVs. So yeah, I'm beyond satisfied because I feel I own something outside of just my car and it has given me moments I've experienced I didn't anticipated when buying my Tesla!"

(Michael, Tesla Model S)

Stephan reinforces the remarks made by Michael, also drawing on how feelings of CPO lead to him feeling more satisfied overall with owning a BEV.

"I love my car for one of these all modern and technologically advanced stuff as well as how good it is for the environment. But I have to say this car makes me feel connected to other EVs because we share so much in common. Even going to some meet ups do you get the sense that we are here together, and this is our thing. For that reason alone, I am very happy with my car because of the collective feelings I have gained I never knew otherwise existed!"

(Stephan, MG ZE EV)

Based on these discussions it is logical to propose the following hypotheses that would be suitable for testing in further quantitative research:

- **H7A:** There is a positive relationship between BEV owners that report feelings of IPO over their car and levels of satisfaction with owning a BEV.

- **H7B:** There is a positive relationship between BEV owners that report feelings of CPO towards the BEV community and levels of satisfaction with owning a BEV.

4.5.4 Public Pride (Hubristic and Collective)

Interpretation of the data revealed feelings of pride were again put forward by participants; however, this time in conjunction with the three outcomes of PO in this study. Feelings of hubristic and collective pride were mentioned as an outcome of having feelings of PO subject to whether the outcome was denoted at an individual or collective level. Hubristic pride depicts a sense of superiority following the evaluation of yourself against others hence is more publicly expressed Tracy et al (2007). By contrast collective pride describes a celebratory emotion occurring at group level to commemorate the collective achievements and values of the group (Decrop and Derbaix 2010; van Leeuwen et al. 2013; Sullivan 2014). Consistent with Tracy et al. (2007), Sullivan (2014) and Ahuvia et al. (2018) line of reasoning, these facets of pride are not only more publicly expressed than the other facets discussed earlier, but indeed suggest they have no impact on the development of PO, as they do not reflect investment or effort made by the self. Rather, these forms of pride express outcomes by portraying self-confidence and self-importance.

It was understood that public pride served as a mechanism to strengthen feelings of PO regarding the various consequences revealed earlier. As will become evident later in this section, hubristic pride was mentioned in accordance with IPO, whereas collective pride was cited when remarks about CPO were put forward. Germane to the context of BEV ownership, these facets of pride were recalled when participants referred to the development of their identity, word-of-mouth, or satisfaction with their BEV suggesting that both hubristic and collective pride play a salient role during this development.

The following section first discuss hubristic pride with respect to each the three outcomes of PO; activated product related identity, word-of-mouth and product satisfaction before presenting discussions relating to collective pride.

A) Hubristic Pride

Although authentic pride was mentioned alongside appropriating the BEV's technology, feelings of hubristic pride were also evident when discussing status and identity and ownership of a BEV. While not all participants mentioned feeling hubris, those who did suggested feeling hubris because of the confidence and self-worth gained from owning a BEV. Given that hubristic pride illustrates some degree of self-enhancement, it was understood hubristic pride is used to signal superiority over others (namely non-BEV owners) that draw the individual closer to the car and hence, feel a desire to reflect and derive the identity of their car to further enhance the self. Alex and Karen offer clarity on this matter:

"Sometimes on cold winter mornings you're in a traffic queue and you just see all sort of emissions being pushed out from tailpipes of cars and you can't help but feel rather smug and better than them for not contributing to those dirty emissions. I think because of this it I feel quite bonded to my car which I didn't expect. I have told people quite proudly about this in the past. My car is capable of this and that and that really resonates with me and who I am today."

(Alex, BMW i3)

Similarly, Karen showed expressed feeling hubris as she believes she is has done more to protect the natural environment than others by willingly wanting to own a BEV.

'I can't help to feel that I'm doing my bit for the environment better than other people so in that sense I do see the comparison. I'm making a positive difference and unfortunately, they're not. When I tell people about my car, they quickly notice how attached I am and I think that's down to the fact there is a lot of overlap between my personality and the car. And I'm really proud of that and most definitely proud to own an EV'.

(Karen, Tesla Model X)

In addition to feelings of hubristic pride being evident during the discussions of activated product related identity this also surfaced when discussing word-of-mouth. Since word-of-mouth serves as a mechanism to enhance the self, those who express hubristic pride suggest this elevates the feelings between IPO and word-of-mouth. As documented by Kirk et al. (2015) and Ahuvia et al. (2018), when informing others of the possessions that shape the self, this signals enhancement of the self and to others. Hence, hubristic pride contributes to the enhancement of self-evaluation due to the nature of its emotions and intentions. Jack was a prime example of this kind of bias:

"Just like any previous car in the beginning I tend to feel a little bit smug driving around and telling others about it because the car is such a big deal for me. Obviously, it fades away after a while, but I don't think it's faded away with this car. I can't help but feel I am ahead of the curve by owning the latest type of car but also sending out a message that I am greener than you. That's why I found my car to be a really easy conversation starter."

(Jack, VW ID.3)

Although some participants shared the remarks made by Jack, other participants such as Malik, shared an opposing view describing avoiding feeling hubris. Thus, it is clear the role of hubristic pride in PO warrants further investigate this, as will later become apparent in chapter 6.

"I do a lot of self-reflection and that is something that I do as a person. I always think to myself, you know, oh, why am I being prideful now? Am I missing something? Is it because I'm being proud that I'm not progressing? I'm not going to the next stage? And I always feel that part of the reason why I'm successful and I'm able to afford a car like that is because I never had that hubris, because I do think by being hubris you to create your own bubble means that you have to essentially dismiss everybody else. And then that way you kind of dismiss opportunities in a way."

(Malik, Porsche Taycan)

Finally, hubristic pride was also mentioned when participants spoke about being satisfied with their BEV. Although most participants felt proud about the effort and investment, they made towards owning a BEV, and as a result, valued and appreciated their car more. It was interesting

to observe participants valued and appreciated the car because of a sense of superiority and confidence owning this car gave them. Participants like Alex for instance mentioned the high levels of satisfaction he gains from his BEV is largely attributed to the strong emotional attachment towards it (i.e it is "mine"). It is because of how, this car helps Alex and other participants feel (i.e more confident and superior on the road) does this enhance the satisfaction towards their car.

"I really do like and I'm very proud of this car because of what it has given me. I've had a lot of experience with this car over time have grown towards it I think that's why I like it more than my previous ones. But I have to say this car does make me feel better about myself and how I love my lifestyle especially when I know that despite my age, I'm still capable of using tech quite well. It's a very strange feeling of satisfaction to explain and I think until you own one it's quite hard to put in words."

(Hussain, Jaguar I-Pace)

In light of the preceding discussion and findings, the following hypothesises are put forward for testing in further quantitative research:

- **H8A:** The effect of IPO on activated product related identity is moderated by feelings of hubristic pride.

- **H8B:** The effect of IPO on word-of-mouth is moderated by feelings of hubristic pride.

- **H8C:** The effect of IPO on product satisfaction is moderated by feelings of hubristic pride.

B) Collective Pride

Collective pride was cited by almost all participants indicating this emotion is well valued and consistent among BEV owners. More specifically, collective pride was expressed in conjunction with discussions made on CPO that being, there seems to be a sense of collective pride for being part of a group (Decrop and Derbaix 2010; Sullivan 2014). For instance, participants who

expressed being part of some sort of BEV owners' group whether digitally or otherwise, seemed to express feelings of happiness and group success for their collective achievement in owning a BEV. There was a strong indication that the feeling of collectiveness with other BEV owners not only led to the construction of the group identity but is strengthened when feelings of collective pride were expressed. This celebratory emotion might stem from the fact that group members recognise they share common values and concerns about being towards behaving environmentally responsible but also to signal others to own a BEV. David and Christopher highlight this kind of bias:

''It certainly makes you feel part of a group of people who can sort of say, we sort of say we can sort of see the bigger picture, you know, we can see the way the world's going. Why does the rest of us have to keep on having a petrol car if we don't want more? Yea proud of each others decisions for doing the right thing. It's very much shows the world this is who we are this is how we see ourselves.''

(David, Renault Zoe)

''I do recognise and identify with those who drive BEV. You notice this sense of collective understanding and application that's way beyond a car. Its who we are and what we are aiming for. That is, we're not just committing to EVs but challenging ourselves on how to be more sustainable in other areas. I never thought I'd be proud of my car in that way I guess that's just an outcome of feeling part of a group.''

(Christopher, Tesla Model S)

The participants also showed that those who felt a sense of CPO towards the BEV community in doing so elicited collective pride and as a result, tend to communicate their experiences with those around them. It was evident participants who described feelings of collective pride had a more positive perception of the owner's community. This led to regular engagement in positive

word-of-mouth, particularly to non BEV owners, as to communicate the collective accomplishments concerning the preservation of the natural environment. Collective pride in this case seemed to help encourage word-of-mouth to emphasise the strong feelings shown towards the BEV community. It was evident collective pride goes beyond signalling togetherness and group achievement but also to communicate rivalry between groups. This echoes the findings of Decrop and Derbaix (2010), who observed individuals belonging to groups are likely to engage in word-of-mouth to reflect and flaunt their group and the collective satisfaction that comes with it. Bethan and Ahmad demonstrate example of this kind of bias:

"Being part of a Tesla owners UK or just being identified with other Tesla owners has such a different feeling then just identifying with other EV owners. It's that something special and uniqueness of belonging to a very specific group and feeling a sense of togetherness. That's why whenever I try to convince others to get an EV, I always push them towards getting a Tesla because of fantastic and better our group is than the others."

(Bethan, Tesla Model 3)

"You being part of this group, that there is some form of collective unit that you're all doing your best to support our environment and take care of our planet. There is a sense that we are all doing something that's a little bit exclusive to outsiders and that should be something worth celebrating and telling other about. The more conversation we make the quicker we will start seeing changes. It all about working as a collective".

(Ahmad, Tesla Model 3)

Finally, feelings of collective pride were discussed as a reason for being satisfied with their car, which was largely attributed to the individuals feeling proud of the collective efforts and contributions in preserving the natural environment. In other words, in addition to the various user-specific features of BEVs, it is what owning a BEV symbolises and how it is a platform to engage with the wider BEV owner's community that motivates feelings of collective pride to

emerge and in turn, a higher degree of product satisfaction. Hence, it was understood some owners view their BEV as more than just a product but also a means to engage with the wider community of BEV owners and share a sense of collective accomplishment and purpose. Statements made by Yousef and Emma show examples of this kind of bias:

"I am very much satisfied with my electric car. I love how it drives I love all the different things that can do and how easy it is to do it as well. But one thing I didn't anticipate was how it gave me a different view on car ownership. Because I am part of the electric car club, I connect to other people that drive electric cars usually when I stop to charge. That for me it what drives my satisfaction. I'm quite proud of it and proud to be amongst the other EV owners too."

(Yousef, Jaguar I-Pace)

"This is probably my favourite ever car. Not just because of how different it is but I feel included when seeing about other EV drivers on the road. I belong part of a community that values sustainable transportation and together are making big strides in being eco-conscious. I'm really proud of our efforts in that sense. Really happy with how it [BEV ownership] turned out."

(Emma, Nissan Leaf)

Based on the above rationale, the following hypothesis is offered for testing in further quantitative research:

- **H9A:** Feelings of collective pride moderate the positive relationship between CPO and Activated Product Related Identity.

- **H9B:** Feelings of collective pride moderate the positive relationship between CPO and word-of-mouth.

- **H9C:** Feelings of collective pride moderate the positive relationship between CPO and product satisfaction.

4.6 Conclusion and Development of the Conceptual Model

This chapter presents the findings that capture the ownership experience of existing BEV owners based on interview data from the qualitative phase of the study. These discussions outline in detail the responses shared by participants from the 24 interviews conducted and combine the knowledge and debates put forward by prior studies to provide significant insight into how feelings of PO develop in the context of BEV ownership. In lieu of the findings presented by scholars about PO, it was evident that PO is a multidimensional construct involving antecedents, outcomes and variables that influence the development of these two components.

The most prominent finding that transpired was how, in the context of BEV ownership, feelings of PO can take place both at the individual and collective levels in the same setting. Additionally, it was revealed feelings of pride are not only a multifaceted emotion, but also plays a key role between both the antecedents and outcomes and feelings of PO. The data suggests that appropriation of technology is an antecedent to IPO and is mediated by feelings of *authentic* pride. Moreover, environmental concern is believed to be antecedent to both individual and collective feelings of PO and further mediated by feelings of *moral* pride. Beyond this, both the feelings of IPO and CPO as a result of owning BEV were understood to result in three behavioural outcomes: activated product related identity, word-of-mouth and product satisfaction. The analysis further postulates that feelings of public pride, namely hubristic and collective, strengthen the relationship between IPO and CPO respectively, and each of the three outcomes. This understanding provided supporting indications to propose appropriate hypotheses and was used to develop a conceptual model for further investigation and ascertain the development of PO within BEV ownership. Figure 9 illustrates the proposed conceptual framework:

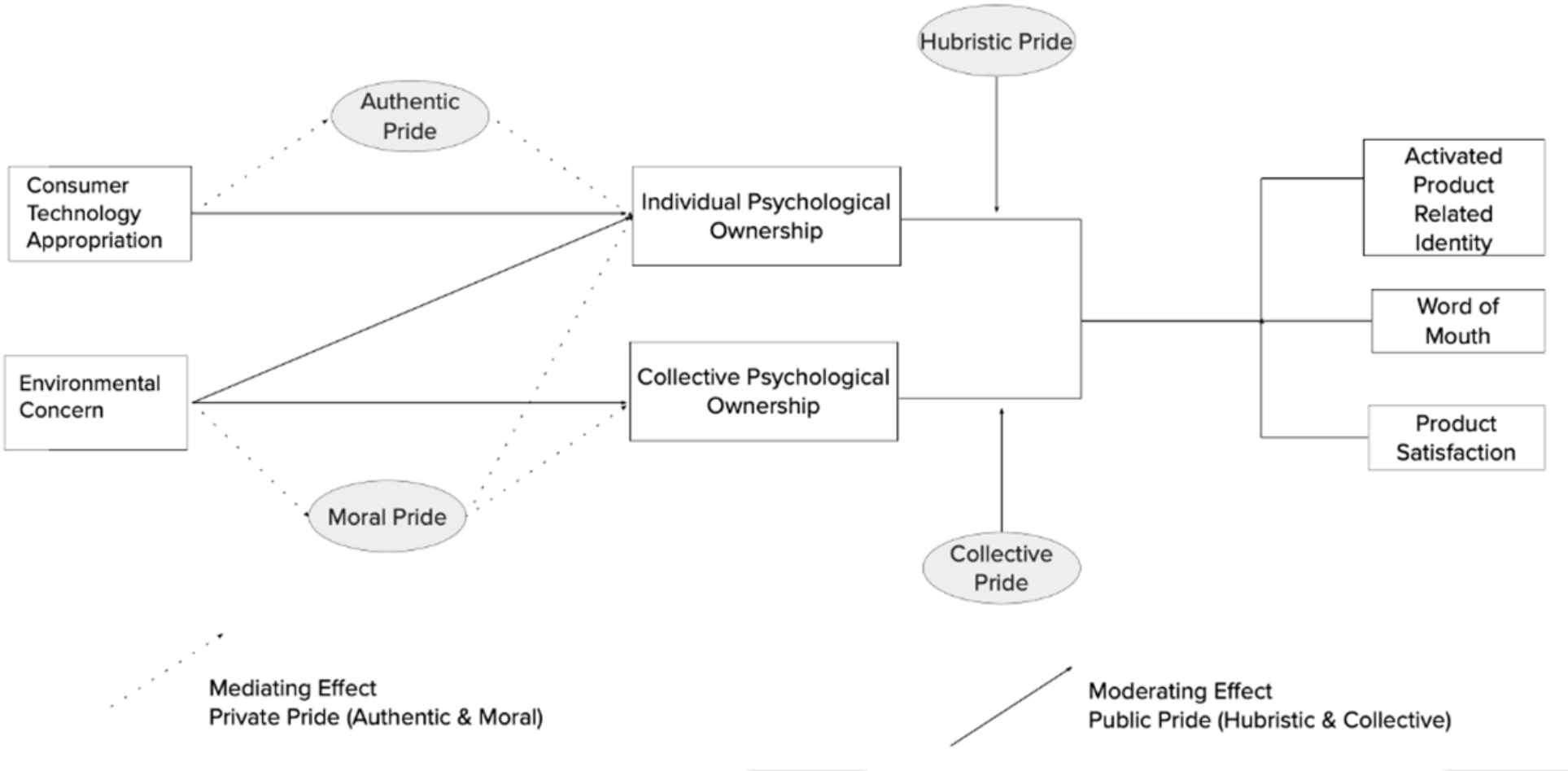


Figure 9 Antecedents and Outcomes of Psychological Ownership – A Two-Way Path Framework.

In order to examine this framework, and as discussed in Chapter 3.5, an extensive review of the literature was conducted to identify existing and established scales in order to adapt and reflect the research instrument and the hypotheses proposed in this chapter.

Thus, to test the conceptual model offered in this chapter and further examine the relationships between the variables derived and their corresponding hypotheses, the study proceeds to the quantitative phase of the research detailed in Chapters 5 and 6.

CHAPTER 5

QUANTITATIVE FINDINGS I - PILOT SURVEY ANALYSIS AND SCALE PURIFICATION

5.1 Introduction

This chapter provides the analysis results of the pilot survey data. The purpose of this chapter was to refine the scale items for the survey in preparation for collecting responses during the main survey. The pilot survey was distributed to BEV owners in Wales, and 101 responses were collected. First, a descriptive analysis of the measurement items was conducted to highlight the mean, standard deviation, and frequency of the results. Following this, exploratory factor analysis using principal component analysis technique was preformed to identify the underlying relationships between the measured variables. Subsequently, from the original 75 items used in the pilot survey, 57 were retained and carried forward as part of the main survey. The results are presented in chapter 6.

5.1.1 Profile Overview of Pilot Study Respondents

Prior to conducting scale purification, a brief overview of the respondents' profiles from the pilot study is presented. Of the 101 respondents, 74% were male and 26% were female. The majority of the pilot respondents were male (n=74) aged between 41 to 50 (n=39). The length of ownership of the respondents' current BEV depicts normal a distribution with most of the sample stating between 1 to 2 years for their current BEV. Table 5.1 presents this information below:

Table 5.1 Distribution of Pilot Study Respondents			
Gender	**Distribution (%)**	**Length of Ownership**	**Distribution (%)**
Male	74	Under 6 months	11
Female	26	Between 6 months – 1 Year	21
		Between 1 Year – 2 Years	30
Age		Between 2 Years – 3 Years	24
18 – 21	0	Between 3 Years – 4 Years	10
22 – 30	5	4 years +	4
31 – 40	21		
41 – 50	39		
51 – 66	30		
66+	5		

5.2 Scale Purification Procedure

This section presents the steps taken to enhance the reliability of the survey items to both validate and produce a robust scale. As outlined in chapter 3.6.1 items were generated based on previously established scales used in the literature as well as findings from the qualitative interviews. These items were used to measure the antecedents and, independent, dependent, mediating, and moderating variables in the proposed theoretical framework. The steps were followed in accordance with the guidelines set by Haws et al. (2023) who outlined the various stages to be taken by the researcher when developing and assessing the reliability of a scale in studies on consumer behaviour.

The first step involved conducting a descriptive analysis of each item used to evaluate the mean (tendency), dispersion (standard deviation) and frequency (percentage). This was applied to each construct namely: consumer technology appropriation, environmental concern, IPO, CPO, activated product related identity, word-of-mouth, product satisfaction, private pride (authentic and moral) and public pride (collective and hubristic). The preceding step used in the scale purification process was the calculation of the coefficient alpha to identify and eliminate items that were deemed unreliable in measuring the underlying construct (Haws et al. 2023). This was

conducted until a satisfactory coefficient was achieved where the alpha value for each item was at least 0.7, with a corrected item-total correlation of at least 0.4 (Haws et al. 2023). Following this, the final items retained after the reliability assessment were subjected to exploratory factor analysis to further assess the model of fit. This was achieved by first calculating the Kaiser-Meyer-Olkin (KMO) and Barlett Test of Sphericity to assess how suited the data is factor analysis before assessing the Eigenvalues to evaluate how many factors to extract.

5.3 Descriptive Analysis of Measurement Scales

This section presents a descriptive analysis of each item and highlights the mean, standard deviation, and frequency results. Each item was measured using a 7-point Likert scale ranging from (1) “Strongly Disagree”, (2) “Somewhat Disagree”, (3) “Disagree”, (4) “Neither Disagree nor Agree”. (5) “Agree”, (6) “Somewhat Agree” and (7) “Strongly Agree”. This scale was consistent across all constructs namely, consumer technology appropriation, environmental concern, IPO, CPO, activated product related identity, word-of-mouth, product satisfaction, private pride (authentic and moral pride) and public pride (collective and hubristic).

A) Consumer Technology Appropriation

Table 5.2 Descriptive Analysis for Consumer Technology Appropriation

Construct	**Items**	**Response Scale (%)**							**Mean**	**SD**
		1	2	3	4	5	6	7		
Using the Plug in Charging System	CTA01	0.0	0.0	4.0	6.1	33.3	26.3	30.7	5.73	1.086
	CTA02	1.0	0.0	4.0	8.1	41.4	27.3	19.2	5.49	1.024
	CTA03	0.0	1.0	2.0	8.1	36.4	27.5	25.8	5.63	1.075
	CTA04	1.0	1.0	0.0	4.0	39.4	27.3	27.3	5.48	1.081
Interaction with Smartphone Application	CTA05	1.0	4.0	1.0	15.2	34.3	24.2	20.2	5.31	1.299
	CTA06	2.0	2.0	1.0	21.2	32.3	21.2	20.2	5.24	1.318
	CTA07	1.0	2.0	3.0	21.2	29.3	15.2	28.3	5.34	1.364
	CTA08	1.0	3.0	1.0	22.2	29.3	23.2	20.2	5.26	1.298

Autonomous Driving Features	CTA09	0.0	12.1	8.1	35.4	23.2	15.2	6.1	4.39	1.346
	CTA10	3.0	11.1	15.2	29.3	17.2	18.2	6.1	4.25	1.507
	CTA11	0.0	9.1	15.2	30.3	24.2	13.1	8.1	4.41	1.363
	CTA12	4.0	9.1	17.2	31.3	19.2	15.2	4.0	5.46	1.436

Consumer technology appropriation was measured using 12 items. CTA01 - CTA04 measured interactions with the plug-in charging system. Items CTA05 - CTA08 measured interaction with the smartphone application and finally items CTA09 - CTA12 measured and feeling in control when using autonomous driving features. For items CTA01 - CTA04, respondents somewhat agree that because of the consistent and regular interaction with technology when charging their car, this helps them feel more in control of their BEV. This is shown by the items with mean scores of greater than 5. For items CTA05 - CTA08 the data showed that respondents somewhat agree that by interacting with their car through the smartphone application gives them a sense of control over their car beyond the driving aspect. This was highlighted by items with mean scores above 5. Finally, for items CTA09 - CTA011, respondents neither disagree nor agree that they feel at the "cutting edge" of technology and in control of their car when using autonomous driving features. This was indicated by a mean score of 4.25 - 4.41. However, Item CTA12 suggests they somewhat agree they do not feel confident when handling problems with autonomous driving features (mean 5.46) suggesting respondents for a lack of control if general problems were to arise when using autonomous driving features.

B) Environmental Concern

Table 5.3 Descriptive Analysis for Environmental Concern

Construct	**Items**	**Response Scale %**							**Mean**	**SD**
		1	2	3	4	5	6	7		
Feelings of Attachment Towards Environment	EC01	2.0	1.0	3.0	12.1	29.3	29.3	23.2	5.46	1.296
	EC02	2.0	2.0	6.1	10.1	31.3	23.2	24.2	5.36	1.401
	EC03	2.0	5.1	4.0	13.1	26.3	28.3	21.2	5.26	1.468
	EC04	2.0	2.0	5.1	18.2	18.2	33.3	21.2	5.33	1.407

Moral Obligation	EC05	5.1	1.0	0.0	11.1	22.2	26.3	34.3	5.61	1.517
	EC06	2.0	7.1	5.1	11.1	28.3	17.2	29.3	5.25	1.606
	EC07	2.0	0.0	1.0	10.1	25.3	20.2	41.4	5.83	1.286
	EC08	4.0	0.0	2.0	7.1	21.2	23.2	42.2	5.89	1.277
Assumed Responsibility	EC09	2.0	1.0	2.0	11.1	23.2	27.3	33.3	5.68	1.277
	EC010	1.0	3.0	4.0	9.1	34.3	26.2	22.2	5.42	1.318
	EC01	2.0	2.0	7.1	12.1	21.2	33.3	22.2	5.37	1.418
	EC012	2.0	0.0	2.0	11.1	37.4	21.2	26.3	5.51	1.240

Environmental Concern was measured using 12 items. EC01 - ECA04 measured whether respondents held feelings of attachment towards the natural environment around them. Items EC05 - EC08 measured their feelings of green moral obligation, finally items EC09 - EC12 measured their feelings of assumed responsibility to protect the natural environment. For items EC01 - EC04 in general, respondents somewhat agree that they hold feelings of ownership towards the natural environment. This is reflective of the statements for items with a mean score of greater than 5. For items EC05 - EC08, the data showed that respondents somewhat agreed by felt a sense of moral obligation to protect the natural environment. All statements measuring this have mean scores above 5, suggesting that protecting and conserving the natural environment by changing their consumption behaviour is the right thing to do. Finally, for items EC09 - EC012 respondent somewhat agree that they hold feelings of assumed responsibility to care for the natural environment. This was indicated by a mean score of greater than 5. Interestingly, 31.2% of the respondents responded strongly agree to the items measuring environmental concern, suggesting environmental responsibility plays a significant role in evaluating ownership feelings.

C) Individual Psychological Ownership

Table 5.4 Descriptive Analysis for IPO

Construct	Item Label	Response Scale %							Mean	SD
		1	2	3	4	5	6	7		
IPO	IPO01	2.0	1.0	4.0	18.2	32.3	24.2	18.2	5.23	1.301
	IPO02	2.0	3.0	3.0	12.1	37.4	15.2	27.3	5.34	1.408
	IPO03	4.0	0.0	2.0	12.1	32.3	21.2	28.3	5.49	1.312
	IPO04	5.1	1.0	1.0	12.1	25.3	16.2	39.4	5.58	1.578

IPO was measured using 4 items. IPO01 – IPO04 measured whether the respondents' held feelings of IPO towards their BEV. It is clear that respondents indeed hold feelings of IPO towards their car as evidence by 70% or more of the respondents who selected between somewhat agree, agree and strongly agree. This indicates that beyond feelings of legal ownership respondents also perceive ownership towards their car psychologically indicating feelings of attachment towards it. The data show that the mean result for IPO was somewhat agree which was between 5.23 and 5.58. This is not surprising considering other similar studies confirm consumers tend to develop feelings of PO towards their car (Bardhi et al. 2012; Ye and Gawronski 2016).

D) Collective Psychological Ownership

Table 5.5 Descriptive Analysis for CPO

Construct	Item Label	Response Scale %							Mean	SD
		1	2	3	4	5	6	7		
CPO	CPO01	2.0	4.0	2.0	19.2	36.42	26.3	10.1	5.03	1.281
	CPO02	3.0	6.1	7.1	15.2	21.2	38.3	10.1	5.72	1.691
	CPO03	3.0	5.1	4.0	22.2	21.2	29.3	15.2	5.02	1.498
	CPO04	2.0	2.0	3.0	20.2	23.2	34.3	15.2	5.24	1.318

CPO was measured using 4 items. CPO01 – CPO04 measured whether the respondents' held feelings of CPO from being part of a wider community of BEV owners. Unlike IPO, the data for CPO is less convincing that feelings of psychological ownership are also present but at a collective level as just 10-15% of the respondents selected strongly agree for the four statements on CPO. Nonetheless, all the CPO items CPO01- CPO04 recorded a score of greater than 5 suggesting the respondents strongly agree they hold feelings of CPO. In particular, item CPO02 which questioned whether respondents feel they are part of an exclusive community that represents they own a BEV "this community is ours", 69.6% of the respondents said they agree. Therefore, indicating in general feelings of CPO are present among owners of BEVs.

E) Collective Pride

Table 5.6 Descriptive Analysis for Collective Pride

Construct	Item Label	Response Scale %							Mean	SD
		1	2	3	4	5	6	7		
Collective Pride – Part of Exclusive Group	CP01	2.0	3.0	10.1	26.3	20.2	30.3	8.1	4.83	1.371
	CP02	3.0	3.0	6.1	30.3	16.2	31.3	10.1	4.88	1.423
	CP03	2.0	5.1	4.0	29.3	25.3	20.2	14.1	4.88	1.416
	CP04	3.0	3.0	7.1	31.3	19.2	29.3	8.1	4.93	1.340
	CP05	2.0	4.0	7.1	34.4	26.3	16.2	10.1	4.68	1.339
Collective Pride - Using the latest Technology	CP06	2.0	4.0	9.1	29.3	23.2	20.2	12.2	4.77	1.413
	CP07	2.0	6.1	4.0	34.3	18.2	28.3	7.1	4.74	1.375
	CP08	1.0	6.1	7.2	31.3	17.2	27.3	11.4	4.81	1.405
	CP09	2.0	8.1	6.1	34.3	25.3	12.1	12.1	4.60	1.414
	CP10	2.0	9.4	3.0	32.3	22.4	16.2	15.2	4.84	1.455
Collective Pride - Behaving Environmentally Responsible	CP11	3.0	3.0	8.1	31.3	18.2	24.2	12.1	4.80	1.450
	CP12	2.0	5.1	9.5	24.1	17.2	29.3	13.1	4.91	1.478
	CP13	3.0	5.1	9.1	27.3	22.2	17.2	16.1	4.79	1.507
	CP14	3.0	5.1	9.1	23.2	20.2	27.3	12.1	4.83	1.512
	CP15	2.0	9.1	8.1	28.3	14.1	21.2	17.2	4.76	1.617

Collective Pride (CP) was measured using 15 items. CP01 - CP05 measured whether respondents felt proud they were among an exclusive group of drivers on the road. CP06 - CP10 measured whether respondents feel proud to be among those whose car uses the latest technology. Finally, items CP11 - CP15 measured where the respondents feel proud that together with other BEV owners, they encourage others to be more environmentally responsible.

Interestingly, the mean result for all 15 items was between 4.60 and 4.91 indicating in general respondents neither disagree nor agree they hold feelings of collective pride for each respective construct. Having said this when calculating the average response percentage for those who responded between somewhat agree, and strongly agree there was some disparity between the results. 58% of the respondents selected somewhat agree or strongly agree when questioned whether they felt proud for being part an exclusive group. In comparison, 51% of the respondents elected somewhat agree to strongly agree one question is whether they felt proud for being among those who used the latest technology. Finally, 55% of the respondents selected between somewhat agreed to strongly agree when asked whether they felt proud together they were encouraging others to be behave more environmentally responsible. This suggests, while the data indicate the mean response was neither agree nor disagree it is evident that at least 51% of the responses agree with the statements that they hold some feelings of collective pride. As shown later in this chapter, some items were eliminated following reliability analysis to better reflect an accurate scale to measure collective pride.

F) Authentic Pride

Table 5.7 Descriptive Analysis for Authentic Pride

Construct	Item Label	Response Scale %							Mean	SD
		1	2	3	4	5	6	7		
Authentic Pride (AP)	AP01	2.0	3.0	1.0	23.2	28.3	29.3	13.1	5.13	1.299
	AP02	3.0	3.0	0.0	34.3	13.1	24.2	22.2	5.13	1.496
	AP03	3.0	1.0	1.0	28.3	23.2	26.3	17.2	5.15	1.358
	AP04	3.0	2.0	1.0	21.2	27.2	22.3	23.1	5.27	1.420

	AP05	2.0	2.0	3.0	24.2	24.2	25.3	19.2	5.19	1.368
	AP06	2.0	1.0	1.0	23.2	22.2	28.3	22.2	5.36	1.321
	AP07	2.0	1.0	2.0	27.3	24.2	28.3	15.2	5.16	1.283

Authentic Pride (AP) was measured using 7 items. AP01 – AP07 measured whether respondents hold feelings of authentic pride because they have access to an interact with various technology features in their BEV. The average mean response percentage for the statements was between 5.13 and 5.36. This suggests respondents agree with the statement that indeed they hold feelings of authentic pride when reflecting their ability to interact and use the various technology features in the car. This result is in line with other similar studies which also confirm feelings of authentic pride emerge when consumers evaluate their abilities on the successful use and interaction with various technologies (Kirk et al. 2015; De Hooge and Van Osch 2021).

G) Hubristic Pride

Table 5.8 Descriptive Analysis for Hubristic Pride

Construct	**Item Label**	**Response Scale %**							**Mean**	**SD**
		1	2	3	4	5	6	7		
Hubristic Pride - Comparison against NON-BEV owners	HP01	18.2	22.2	23.5	21.3	5.1	10.1	0.0	3.04	1.518
	HP02	20.2	19.2	30.3	26.3	1.0	30.3	0.0	2.78	1.242
	HP03	20.2	28.3	24.2	22.2	1.0	4.0	2.0	2.68	1.276
	HP04	22.4	18.2	19.2	19.2	6.1	14.1	1.0	3.15	1.716
Hubristic Pride - Not emitting CO2	HP05	25.3	23.2	23.6	19.4	2.0	5.7	1.0	2.72	1.670
	HP06	20.2	18.2	32.3	22.2	1.0	4.0	2.0	2.86	1.471
	HP07	27.3	19.2	22.2	24.2	3.0	3.0	1.0	2.70	1.392
	HP08	22.2	18.2	23.2	15.2	6.1	12.1	3.0	3.13	1.417

Hubristic Pride (HP) was measured using 5 items. HP01 – HP05 measured whether respondents held feelings of hubristic pride because when comparing themselves against those who do not own a BEV or reflect on not being a CO2 when driving they feel 'superior'. It was interesting to learn the mean response percentage for the statements was between 2.703 and 3.15 suggesting that respondents *disagree* with the statements and do not feel hubristic pride when reflecting on the statements. In the development of the hubristic pride scale by Tracy et al. (2007), it was mentioned while individuals may hold feelings of hubristic pride, the idea of feeling superior or better than others is not often a feeling individuals wish to express publicly. Building on this and reflecting on the findings from the qualitative findings of the study, it was evident some owners did hold feelings of hubristic pride but avoid expressing them. One explanation for this may be centred around social desirability bias, where it is common for respondents to answer questions in a way but suppress their true opinions in order to be viewed favourably by others (Fisher 1993; Krumpal 2013). As a result, these responses may over or under report actual behaviour.

H) Moral Pride

Table 5.9 Descriptive Analysis for Moral Pride

Construct	Item Label	Response Scale %							Mean	SD
		1	2	3	4	5	6	7		
Moral Pride (MP)	MP01	3.1	4.0	3.0	24.2	12.1	37.4	16.1	5.25	1.619
	MP02	5.1	5.1	1.0	10.1	37.4	28.3	13.1	5.37	1.493
	MP03	4.0	3.0	1.0	17.2	26.3	32.2	16.2	5.21	1.443
	MP04	6.1	2.1	4.0	24.2	24.2	23.2	16.2	5.06	1.670

Moral Pride was measured using 4 items MP01 – MP04. These items aim to measure whether the respondents feel proud for the positive impact that owning of the BEV has a natural environment. The data indicates the main score is above 5 suggesting in general respondents agree they feel a sense of moral pride when reflecting on their behaviour of owning a BEV and the positive impact this has on the natural impact.

I) Activated Product Related Identity

Table 5.10 Descriptive Analysis for Activated Product Related Identity

Construct	Item Label	Response Scale %							Mean	SD
		1	2	3	4	5	6	7		
Activated Product Related Identity (APRI)	APRI01	5.1	5.1	5.1	21.2	24.2	29.3	10.1	4.83	1.539
	APRI02	4.9	5.4	9.2	20.0	23.2	25.3	12.1	4.76	1.591
	APRI03	5.4	5.1	11.1	17.2	28.3	23.2	10.1	4.69	1.563
	APRI04	7.1	2.0	8.1	13.1	25.2	27.3	17.2	4.98	1.660
	APRI05	6.1	2.0	5.1	18.2	26.3	27.4	15.8	5.03	1.571

Activated Product related Identity was measured using 5 items. APRI01 – APRI05 measured whether respondents feel they have derived an identity from their car because of their feelings of ownership towards it. In doing so the statements measure whether owners of BEV feel whether there is an overlap between their self-identity and their car (e.g., they both signal being environmentally responsible). While the data derived from the qualitative interviews suggested this is the case for most BEV owners, when evaluating the mean result of the responses, majority of the items except APRI05 score between 4.69 and 4.98 indicating responders neither disagree not agree with the statements. Having said this, when calculating the mean responses for all items between somewhat agree to strongly agree, 65% of the responses favoured these responses suggesting that close to two thirds of the sample size do in fact share feelings of moral pride.

J) Word-of-Mouth

Table 5.11 Descriptive Analysis for Word-of-Mouth										
Construct	**Item Label**	**Response Scale %**							**Mean**	**SD**
		1	2	3	4	5	6	7		
Word-of-Mouth (WOM)	WOM01	1.0	1.0	0.0	2.0	21.2	37.4	38.2	6.13	1.044
	WOM02	1.0	1.0	2.3	2.0	30.0	23.2	42.2	6.03	1.111
	WOM03	2.0	0.0	2.0	3.4	23.3	32.3	37.4	6.23	1.069
	WOM04	1.0	2.0	2.0	2.0	25.3	32.2	36.4	5.96	1.068

Word-of-Mouth was measured using 4 items. WOM01 – WOM05 measured whether based on the respondent's experience with owning a BEV thus far would they positively advocate owning a BEV to others. Most of the respondents agree they would speak positively about BEVs to others. As evidenced by the main response score (average of 6.08) the respondents agree with the statements measuring word-of-mouth. This result is not surprising as the responses support the views shared by the BEV owners interviewed during the qualitative stage of the study.

K) Product Satisfaction

Table 5.12 Descriptive Analysis for Product Satisfaction										
Construct	**Item Label**	**Response Scale %**							**Mean**	**SD**
		1	2	3	4	5	6	7		
Product Satisfaction (PS)	PS01	0.0	0.0	0.0	1.0	17.2	26.3	55.6	6.36	0.801
	PS02	0.0	0.0	0.0	2.0	18.2	36.4	43.4	6.22	0.790
	PS03	0.0	0.0	0.0	0.0	19.2	29.3	51.5	6.32	0.780

Finally, product satisfaction was measured using 3 items. PS01 – PS03 measured their overall satisfaction with owning a BEV that's far. In a similar fashion to word-of-mouth, the data shows clearly that majority of the respondents agree that they are satisfied with their ownership of a

BEV shown by majority of the respondents either selecting agree or strongly agree for the statements (80.8% of respondents).

5.4 Determining Scale Reliability

As part of the scale validation procedure, it is recommended that the reliability of the scale to be analysed to reduce the number of scale items (Haws et al. 2023). Consequently, an analysis of the alpha coefficient was conducted for each construct namely: consumer technology appropriation, environmental concern, IPO, CPO, activated product related identity, word-of-mouth, product satisfaction, private pride (authentic and moral pride) and public pride (collective and hubristic). To achieve the highest alpha coefficient possible, scale items were eliminated one by one to maximise the alpha score. The recommended value of the alpha score for scale items to be reliable is at least 0.7, whilst ensuring the corrected item to item correlation is greater than 0.4 (Antwi and Hamza 2015; Hair et al. 2020; Haws et al. 2023). Following elimination of the items, an overall Cronbach coefficient was recalculated for the retained items. The findings are presented below:

A) Consumer Technology Appropriation

Table 5.13 Reliability Assessment for Consumer Technology Appropriation

Construct	Item Label	Statement
Interaction with Plug in Charging	CTA01 *	Understanding how the charging system works, makes me feel as though I am at "the cutting edge" of technology.
	CTA02	Learning how to get the best output when charging my car, makes me feel more in control of my car.
	CTA03	Through information learnt from various charging points, I understand more about the charging capabilities of my car.
	CTA04	I am confident in handling general problems that arise when charging my car.
Interaction with Smartphone Application	CTA05	Understanding how to interact with my car through the smartphone app makes me feel I am at "the cutting edge" of technology
	CTA06	After using the smartphone app to interact with my car, I feel more in control of my car.

	CTA07	Through information learnt from using the smartphone app I understand more about my car.
	CTA08	I am confident in handling general problems with my car by navigating through the smartphone app.
Autonomous Driving Features	CTA09	Without understanding how the car operates autonomously, I do not feel I am at "the cutting edge" of technology.
	CTA10	After using the autonomous features, I feel less in control of my car.
	CTA11	Without gaining information about how the autonomous features work, I do not feel I understand how my car operates.
	CTA12	I do not feel confident in handling general problems that arise when using the autonomous features.

From the reliability analysis, items CTA08 CTA12 were eliminated as highlighted in Table 5.13 to maximise the alpha score (at a level of 0.842) with a corrected item-total correlation of at least 0.62. It is important to note although the alpha score for CTA01* suggested to remove this item, based on the results from the original scale used as well as evidence from the qualitative interviews of this study, the item was retained as it was deemed important to assess whether the plug-in to charge elevates the feeling of being in control when using technology. Subsequently, the retained items were CTA01 - CTA07 and CTA09 - CTA011.

B) Environmental Concern

Table 5.14 Reliability Assessment for Environmental Concern

Construct	Item Label	Statement
Feelings of Attachment Towards Environment	EC01	I feel a strong sense to care for the environment around me.
	EC02	I feel connected to my environment around me.
	EC03	I feel a degree of personal ownership over the environment around me.
	EC04	I feel a strong sense of closeness with the environment around me.
Moral Obligation	EC05	I would feel guilty if my car damages the environment e.g. produces high levels of CO2 emissions.
	EC06	Owning a car that negatively affects the environment goes against my moral principles.
	EC07	I feel that protecting the environment is the right thing to do.

	EC08	I have an obligation to reduce my environmental impact to meet the needs of future generations.
Assumed Responsibility	EC09	I feel a degree of responsibility for the condition of the air around me.
	EC010	I feel partly responsible for contributing towards environmental problems.
	EC011	Because I drive a Battery Electric Vehicle, I do not feel I am contributing or responsible for air pollution.
	EC012*	I feel a degree of responsibility to minimise my environmental impact to enhance the lives of others.

12 items were used to measure Environmental Concern. These items are shown below: From the reliability analysis, items EC02, EC06, and EC010 were eliminated as highlighted in Table 5.14 to maximise the alpha score (found to be 0.897) with a corrected item-total correlation of more than 0.53. Having said this, the alpha score for item EC012* suggested to eliminate this item. However, based on the findings from the interviews of this study, this statement was widely expressed among BEVs owners. Many of the interview respondents expressed feeling a degree of responsibility to control and limit how much CO2 they produce to benefit their families' lives**.** Hence the decision to retain this item was made with a maximum alpha score of 0.897. The retained items were EC01, EC03- EC05, EC07 – EC09 and EC011, EC012.

C) Individual Psychological Ownership

Table 5.15 Reliability Assessment for IPO		
Construct	**Item Label**	**Statement**
IPO	IPO01	I feel connected to my car.
	IPO02	I feel my car belongs to me, it is “mine”.
	IPO03	I feel a high degree of personal ownership of my car.
	IPO04*	I feel I own this car.

From the reliability analysis, items IPO1 – IPO3 were retained as to maximise the alpha score (found to be level at 0.801) with a corrected item-total correlation of more than 0.54. It is important to note however, the alpha score for item IPO04 suggested to remove this item to increase the score. However as demonstrated in key prior studies (Peck and Shu 2009; Fuchs et al. 2010; Dawkins et al. 2017) this item echoes the main theoretical ideas by using two keywords “feel” and “own” which are significant in understanding the theory of PO. Hence, it is important that respondents are asked about this as to be better understand feelings of IPO in the context of BEV ownership where otherwise removing this item would limit how feelings of IPO would be measured. Thus, the item was retained achieving a maximum alpha score of 0.81.

D) Collective Psychological Ownership

Table 5.16 Reliability Assessment for CPO		
Construct	**Item Label**	**Statement**
CPO	CPO01	We (myself and other Battery Electric Vehicle owners) collectively feel we represent a wider community of eco-conscious drivers.

CPO (Continued)	CPO02	We (myself and other Battery Electric Vehicle owners) collectively agree we are part of an exclusive community of Battery Electric Vehicle owners “this community is ours”.
	CPO03	We (myself and other Battery Electric Vehicle owners) feel as though we represent a group of environmentally responsible individuals.
	CPO04	We (myself and other Battery Electric Vehicle owners) collectively agree we are taking positive action towards caring for “our” environment.

From the reliability analysis, all items CPO01 – CPO04 were retained as all items recorded an alpha score above 0.7 giving a maximum alpha score of 0.830 with a corrected item-total correlation of at least 0.63.

E) Collective Pride

Table 5.17 Reliability Assessment for Collective Pride

Construct	**Item**	**Statement:** Collectively myself and other Battery Electric Vehicle owners feel ……. knowing that together we belong to an exclusive group of drivers on the road.
Feelings part of exclusive group of drivers on the road.	CP01	Accomplished
	CP02	Achieving
	CP03	Confident
	CP04	Productive
	CP05	Successful
		Statement: Collectively myself and other Battery Electric Vehicle owners feel ……. knowing that together we use the latest technology when it comes to driving.
Recognised for using the latest technology together.	CP06	Accomplished
	CP07	Achieving
	CP08	Confident
	CP09	Productive

	CP10	Successful
		Statement: Collectively myself and other Battery Electric Vehicle owners feel …… knowing that together we are encouraging others to be more environmentally responsible?
Recognised for behaving environmentally. responsible.	CP11	Accomplished
	CP12	Achieving
	CP13	Confident
	CP14	Productive
	CP15	Successful

From the reliability analysis, items CP01, CP04, CP06, CP07, CP11, CP12, CP15 were eliminated as presented in table 5.17 to maximise the Cronbach alpha score (found to be level at 0.914) with a corrected item-total correlation of more than 0.66. The retained items to achieve these alpha results are CP02, CP03, CP05, CP08 – CP10, CP13 and CP14.

F) Hubristic Pride

Table 5.18 Reliability Assessment for Hubristic Pride

Construct	**Item**	**Statement:** Having access to and interacting with various technology features in my car I sometimes feel…….over those who do not own a BEV.
Comparison against Non BEV owners.	HP01	Snobbish
	HP02	Stuck-up
	HP03	Egotistical
	HP04	Smug
		Knowing that my car does not emit CO2 I sometimes feel…..over those who do not own a BEV
Hubris for not emitting CO2	HP05	Snobbish
	HP06	Stuck-up
	HP07	Egotistical
	HP08	Smug

From the reliability analysis, three items were eliminated, HP01, HP05, HP06 in order to maximise the alpha score (found to be at 0.865). The retained items were HP02 – HP04 and HP07 - HP08 and had a corrected item-total correlation of more than 0.69.

G) Authentic Pride

Table 5.19 Reliability Assessment for Authentic Pride

Construct	Item	Statement: Having access to and interacting with various technology features in my car I feel…….. about myself.
Authentic Pride	AP01	Accomplished
	AP02	Successful
	AP03	Achieving
	AP04	Fulfilled
	AP05	Self-worth
	AP06	Confident
	AP07	Productive

From the reliability analysis, items AP04, AP05 and AP07 were eliminated in order to maximise the alpha score found to be at 0.891) The retained items were AP01 – AP03 and AP06 and had a corrected item-total correlation of more than 0.68.

H) Moral Pride

Table 5.20 Reliability Assessment for Moral Pride

Construct	Item	Statement: Having access to and interacting with various technology features in my car I feel…….. about myself.
Moral Pride	MP01	I feel proud knowing my car demonstrates I have taken action to reduce my environmental impact.
	MP02	I feel proud that my car does not cause a negative environmental impact to the people around me.
	MP03	When I drive my car, I feel proud about knowing I am behaving in an environmentally responsible way.
	MP04	When I drive my car, I feel proud about myself when I see others on the road driving petrol or diesel cars.

From the reliability analysis, only item, MP03 was eliminated in order to maximise the alpha score (found to be at 0.878) The retained items were MP01, MP02 and MP04 which had a corrected item-total correlation of more than 0.53.

I) Activated Product Related Identity

Table 5.21 Reliability Assessment for Activated Produced Related Identity		
Construct	**Item**	**Statement**
Activated Product Related Identity	APRI01	My car helps me achieve the identity I wish to have.
	APRI02	My car helps narrow the gap between who I am and who I try to be.
	APRI03	My car incorporates parts of myself.
	APRI04	There is an overlap between the technology features of my car and my identity (they both signal being tech savvy).
	APRI05	There is an overlap between the environmental benefits of my car and my identity (they both signal being environmentally responsible).

From the reliability analysis, one item was subject to elimination this being APRI03 in order to maximise the alpha score. The other items, APRI01, APRI02 and APRI04 were retained which gave an alpha score of 0.776 with a corrected item-total correlation of more than 0.48.

J) Word-of-Mouth

Table 5.22 Reliability Assessment for Word-of-Mouth		
Construct	**Item**	**Statement**
Word-of-Mouth	WOM01	I would recommend a Battery Electric Vehicle to those who do not yet own one.
	WOM02	I would say positive things about owning a Battery Electric Vehicle to those who do not yet own one.
	WOM03	I would spread the word about owning Battery Electric Vehicle to those who do not yet own one.
	WOM04	I would mention Battery Electric Vehicle to others quite frequently.

From the reliability analysis, only item was eliminated in order to maximise the alpha score, this being item WOM03. The retained items were WOM01, WOM02 and WOM04 which resulted in a maximum alpha score of 0.861 and had a corrected item-total correlation of more than 0.65.

K) Product Satisfaction

Table 5.23 Reliability Assessment for Product Satisfaction		
Construct	**Item**	**Statement**
Product Satisfaction	PS01	I enjoy driving a Battery Electric Vehicle.
	PS02	My car meets or exceeds my expectations of Battery Electric Vehicles.
	PS03	Overall, I am satisfied with my Battery Electric Vehicle.

From the reliability analysis all items were retained as all items recorded an alpha score above 0.7 giving a maximum alpha score of 0.742 with a corrected item-total correlation of at least 0.540.

In summary a total of 57 items were retained to measure each respective construct. Further reliability analysis was carried out for these 57 items and resulted in an overall alpha score of 0.909. Table 5.24 offers a summary of the retained items from the reliability tests which were carried forward to carry out Principal Component Analysis (PCA):

Table 5.24 Summary of Retained Items Following Reliability Analysis. Sample Size N=101					
Factors	**Items**	**Factors (Continued)**	**Items**	**Factors (Continued)**	**Items**
Consumer Technology Appropriation Cronbach Alpha Result = 0.842	CTA01	Collective Pride Cronbach Alpha Result = 0.914	CP02	Activated Product Related Identity Cronbach Alpha Result = 0.776	APRI01
	CTA02		CP03		APRI02
	CTA03		CP05		APRI04
	CTA04		CP08		APRI05
	CTA05		CP09		
	CTA06		CP10		
	CTA07		CP013		
	CTA09		CP014		
	CTA10				
	CTA11				
Environmental Concern Cronbach Alpha Result = 0.897	EC01	Hubristic Pride Cronbach Alpha Result = 0.865	HP02	Word-of-Mouth Cronbach Alpha Result = 0.861	WOM01
	EC03		HP03		WOM02
	EC04		HP04		WOM04
	EC05		HP05		
	EC07		HP08		
	EC08				
	EC09				
	EC011				
	EC012				
IPO Cronbach Alpha Result = 0.795	IPO01	Authentic Pride Cronbach Alpha Result = 0.891	AP01	Product Satisfaction Cronbach Alpha Result = 0.742	PS01
	IPO02		AP02		
	IPO03		AP03		PS02
	IPO04		AP06		PS03
CPO Cronbach Alpha Result = 0.830	CPO01	Moral Pride Cronbach Alpha Result = 0.878	MP01		
	CPO02		MP02		
	CPO03		MP04		
	CPO04				

5.5 Exploratory Factor Analysis (EFA)

Traditionally, in behavioural research, two distinct approaches have been used to conduct Exploratory Factor Analysis (EFA); Principal Component Analysis (PCA) and Maximum Likelihood Factor Analysis (MLFA) (Hair et al. 2020). This study uses PCA, as this technique helps identify patterns in the dataset based on correlations. The overall goal was to compress the dataset by means of dimension reduction while extracting the most important information from the

dataset. In doing so, a new set of all the contact variables, known as principal components, is presented to highlight the pattern of similarity of the observations and variables with the dataset. The PCA procedures outlined by Brown (2015) and Haws et al. (2023) were followed to analyse the data. These scholars argue that there are three main stages in conducting PCA. First, the suitability of the data needs to be assessed. The second step is identifying factor extraction. Finally, the third step is to determine factor rotation and interpretation. The following sections discuss how the proposed steps were followed using the dataset.

5.5.1 Determining Appropriateness of Data for Factor Analysis

It is well documented that scholars hold conflicting views on whether 'the larger the sample size, the better this is'. Consequently, there are inconsistencies among scholars in determining the number of samples needed for an adequate sample size. Harrington (2009) suggested a sample size of at least 300 cases is required to PCA. However, Bandalos and Finney (2018) suggested that if the dataset has a strong and reliable correlation between the factors it is possible that a sample size of less than 300 will be sufficient. Similarly, Hatcher and O'Rourke (2014) argued researchers can look beyond the overall sample size and instead focus on attaining five samples per variable or 100 samples, whichever is larger. Consistent with this view, Kline (2014) proposed two samples per variable are sufficient to carry out PCA. Interestingly both Hatcher and O'Rourke (2014) and Kline (2014) suggest the more variables measured against the factors, this should result in a higher level of commonality between them thus, a smaller sample size can be sufficient. In this study, 101 responses from the pilot study were used to test the retained 57 items following reliability analysis. Hence, based on the guidelines by Hatcher and O'Rourke (2014) and Kline (2014) this study's sample size of 101 is adequate for carrying out PCA.

To determine the strength between the relationship of the items, Haws et al. (2023) recommended assessing the following; (1) determine if the Kaiser-Meyer-Oklin Measure of Sampling Adequacy (KMO) value is between the range of 0 -1 but recommended to be greater than 0.6 and (Tabachnick and Fidell 1996); (2) identify if the results from Bartlett's Test of

Sphericity are statistically significant and (3) assess the correlation matrix for evidence of a coefficient greater than 0.5. Table 5.25 demonstrates the dataset is suitable for factor analysis as the KMO value was found to be greater than 0.6 (0.879) and the Bartlett's Test of Sphericity was statistically significant. These results demonstrate that all items in the study are suitable for carrying our factor analysis.

Table 5.25 KMO and Bartlett Test Results	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.879
Bartlett's Test of Sphericity Approx. Chi Square	2535.406
Df.	1081
Sig.	0.000

5.5.2 Factor Extraction, Rotation and Interpretation

Following confirmation of the appropriateness of the dataset for factor analysis, the next step was to preform factor extraction. This refers to the process of identifying the minimum number of factors required to represent the interrelationships among the group of variables and items. This is achieved by balancing these two key points; first identify a solution with a fewest factors possible. Second, describe the variance in the dataset as much as possible. To achieve this, Kline (2014) and Hair et al. (2020) argue an exploratory approach can be used to determine the different number of factors until suitable solution is established. The main techniques used in behavioural research is adopting Kaiser's criterion i.e the ‘eigenvalue rule’ to determine the number of factors to be extracted where value must be 1.0 or more. This study adopted this technique to determine the eigenvalues and clarify the number of factors in the model. According to Hair et al. (2020) guidelines for identifying significant factor loadings, the factor loading should be 0.55 or more to be considered significant for a sample size of 100 which is reflective of this study. Therefore, the 57 items retained from the reliability test subjected to factor analysis.

It is important to note factor analysis was conducted in four successive stages as the size of the

sample was insufficient to analyse all items simultaneously (n=101). Consequently, the items were grouped based on how conceptually similar they are to each other as shown in table 5.26:

Table 5.26 Items used for Factor Analysis

Factor analysis	Items used.	Reason
Factor analysis 1	CTA01, CTA02, CTA03, CTA04, CTA05, CTA06, CTA07 CTA09, CTA10, CTA11 EC01 EC03 EC04 EC05 EC07 EC08 EC09 EC011 EC012	Components represent the antecedents to IPO and CPO which are; consumer technology appropriation and environmental concern.
Factor analysis 2	IPO01 IPO02 IPO03 IPO04 CPO01 CPO02 CPO03 CPO04	Components represent IPO and CPO respectively.
Factor analysis 3	APRI01 APRI02 APRI03 APRI04 APRI05 WOM01 WOM02 WOM04 PS01 PS02 PS03	Components represent the dependent variables of the model; activated product related identity, word-of-mouth and product satisfaction.
Factor analysis 4	AP01 AP02 AP06 MP01 MP02 MP04 CP02 CP03 CP05 CP08 CP09 CP010 CP013 CP014 HP02 HP03 HP04 HP07 HP08	Components represent the mediator and moderators in the model – private and public pride: - Authentic pride and Moral pride (private pride) - Collective pride and Hubristic pride (public pride)

Based on the four factor analysis stages, 11 components were extracted from the data based on having an eigenvalue greater than 1.0. Table 5.27 highlights the number of factors extracted for each stage as well as their respective eigenvalues.

Table 5.27 Eigenvalues of the Factors

	Factor Analysis 1		**Factor Analysis 2**		**Factor Analysis 3**			**Factor Analysis 4**			
Factor	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
Eigenvalues	3.564	1.983	3.152	2.103	4.192	2.499	1.388	6.437	2.965	1.490	1.227

The preceding step after determining the number of factors is to interpret these by observing the 'rotation' the factors. Patterns between the loadings can be identified in order to interpret the differences between (Harrington 2009; Brown 2015). As noted by Kline (2014) and Hair et al. (2020) the two techniques used for rotation are orthogonal or oblique solutions. In short, orthogonal rotation is accepted as the simpler technique to interpret however requires the researcher to observe the underlying constructor as independent to each other. This differs from the opposing technique with oblique rotation which assumes correlation between factors (Brown 2015). This study adopted the orthogonal rotation as suggested by Hair et al. (2020) given its simplicity and ease in reporting the results.

Tables 5.28 to table 5.31 present the results for the factor analysis displaying the number of factors extracted, the item loading value and the corresponding Cronbach alpha score.

Factor Analysis 1 – Antecedents to PO

Table 5.28 Factor Analysis Results – Antecedents to PO				
Item	**Statement**	**Components**		**Cronbach Alpha Value**
		F1	F2	
CTA01	Understanding how the charging system works, makes me feel as though I am at "the cutting edge" of technology.	0.78		0.842
CTA02	Learning how to get the best output when charging my car, makes me feel more in control of my car.	0.87		
CTA03	Through information learnt from various charging points, I understand more about the charging capabilities of my car	0.82		
CTA04	I am confident in handling general problems that arise when charging my car.	0.74		
CTA05	Understanding how to interact with my car through the smartphone app makes me feel I am at "the cutting edge" of technology.	0.71		
CTA06	After using the smartphone app to interact with my car, I feel more in control of my car.	0.83		
CTA07	Through information learnt from using the smartphone app I understand more about my car.	0.77		
CTA09	Without understanding how the car operates autonomously, I do not feel I am at "the cutting edge" of technology	0.85		
CTA010	After using the autonomous features, I feel less in control of my car.	0.9		
CTA011	Without gaining information about how the autonomous features work, I do not feel I understand how my car operates.	0.73		
EC02	I feel a strong sense to care for the environment around me.		0.94	0.897
EC03	I feel a degree of personal ownership over the environment around me.		0.88	
EC04	I feel a strong sense of closeness with the environment around me.		0.85	
EC05	I would feel guilty if my car damages the environment e.g. produces high levels of CO2 emissions.		0.79	
EC07	I feel that protecting the environment is the right thing to do.		0.71	
EC08	I have an obligation to reduce my environmental impact to meet the needs of future generations.		0.64	
EC09	I feel a degree of responsibility for the condition of the air around me.		0.69	
EC011	Because I drive a Battery Electric Vehicle, I do not feel I am contributing or responsible for air pollution.		0.75	
EC012	I feel a degree of responsibility to minimise my environmental impact to enhance the lives of others.		0.81	

FACTOR ANALYSIS 2 - Psychological Ownership

Table 5.29 Factor Analysis Results – Individual and Collective PO				
Item	**Statement**	**Components**		**Cronbach Alpha Value**
		F3	F4	
IPO01	I feel connected to my car.	0.72		0.795
IPO02	I feel my car belongs to me, it is “mine”.	0.84		
IPO03	I feel a high degree of personal ownership of my car.	0.68		
IPO04	I feel I own this car.	0.91		
CPO01	We (myself and other Battery Electric Vehicle owners) collectively feel we represent a wider community of eco-conscious drivers.		0.76	0.830
CPO02	We (myself and other Battery Electric Vehicle owners) collectively agree we are part of an exclusive community of Battery Electric Vehicle owners “this community is ours”.		0.82	
CPO03	We (myself and other Battery Electric Vehicle owners) feel as though we represent a group of environmentally responsible individuals.		0.83	
CPO04	We (myself and other Battery Electric Vehicle owners) collectively agree we are taking positive action towards caring for “our” environment.		0.72	

FACTOR ANALYSIS 3 – Outcomes of PO

Table 5.30 Factor Analysis Results – Outcomes of PO					
Item	**Statement**	**Components**			**Cronbach Alpha**
		F5	F6	F7	
APRI01	My car helps me achieve the identity I wish to have.	0.68			0.776
APRI02	My car helps narrow the gap between who I am and who I try to be.	0.58			
APRI03	My car incorporates parts of myself.	0.73			
APRI04	There is an overlap between the technology features of my car and my identity (they both signal being tech savvy).	0.91			
APRI05	There is an overlap between the environmental benefits of my car and my identity (they both signal being environmentally responsible).	0.84			
WOM01	I would recommend a Battery Electric Vehicle to those who do not yet own one		0.73		0.861

WOM02	I would say positive things about owning a Battery Electric Vehicle to those who do not yet own one		0.78		
WOM03	I would mention Battery Electric Vehicle to others quite frequently		0.83		
PS01	I enjoy driving a Battery Electric Vehicle			0.64	0.742
PS02	My car meets or exceeds my expectations of Battery Electric Vehicles			0.77	
PS03	Overall, I am satisfied with my Battery Electric Vehicle			0.82	

FACTOR ANALYSIS 4 – Private and Public Pride

Table 5.31 Factor Analysis results - Private and Public Pride

Type of Pride	Statement	Item		Components				Cronbach Alpha
				F7	F8	F9	F10	
Collective Pride	Collectively myself and other Battery Electric Vehicle owners feel …….. knowing that together we belong to an exclusive group of drivers on the road.	CP02	Achieving	0.85				0.914
		CP03	Confident	0.76				
		CP05	Successful	0.72				
	Collectively myself and other Battery Electric Vehicle owners feel ……. knowing that together we use the latest technology when it comes to driving.	CP08	Confident	0.63				
		CP09	Productive	0.69				
		CP10	Successful	0.82				
	Collectively myself and other Battery Electric Vehicle owners feel …… knowing that together we are encouraging others to be more environmentally responsible?	CP13	Confident	0.65				
		CP14	Productive	0.77				
Hubristic pride	Having access to and interacting with various technology features in my car I sometimes feel…….over those who do not own a BEV.	HP02	Stuck-up		0.83			0.865
		HP03	Egotistical		0.80			
		HP04	Smug		0.77			
		HP07	Egotistical		0.72			

	Knowing that my car does not emit CO2 I sometimes feel……over those who do not own a BEV.	HP08	Smug		0.66			
Authentic Pride	Having access to and interacting with various technology features in my car I feel…….. about myself.	AP01	Accomplished			0.72		0.891
		AP02	Successful			0.59		
		AP06	Confident			0.65		
Moral Pride	Thinking about yourself and owning a Battery Electric Vehicle how do you feel about your impact on the environment?	MP01	I feel proud knowing my car demonstrates I have taken action to reduce my environmental impact.				0.87	0.878
		MP02	I feel proud that my car does not cause a negative environmental impact to the people around me.				0.83	
		MP04	When I drive my car, I feel proud about myself when I see others on the road driving petrol or diesel cars.				0.79	

CHAPTER 6

QUANTITTIVE FINDINGS II - MAIN SURVEY ANALYSIS AND FINDINGS

6.1 Introduction

This chapter presents the analysis results of the main survey, which was distributed following refinement of the scale items from the pilot survey data. A total of 426 full responses were obtained from the main survey, which was carried forward for analysis. First, a descriptive analysis was employed to present an overview of the respondents' profiles. Following this, confirmatory factor analysis was conducted using AMOS 26 to validate and assess good model fit. Finally, the hypothesised relationships were tested using SPSS v27 by running hierarchical regression analysis and path analysis using PROCESS macro Hayes to test direct and interaction effects. In addition to the main variables tested, the following variables were included as control variables as these could cofound the results: gender, car brand, type of ownership and length of ownership. Finally, a conclusion to the chapter is presented to highlight the findings and summarise the hypothesis testing findings.

6.2 Survey Response, Non-Reponses Bias, and Common Method Bias

The main survey was distributed using various social channels, with the aim of capturing a broad range of respondents from each region in Wales. The total number of complete responses to the main survey was 426. This number was achieved after discarding unusable questionnaires due to incompletion, responding quicker than the benchmark time (9 minutes 10 seconds) taken from the pilot survey and failing attention-checking questions. Consequently, 859 responses were attempted before removing 433 which resulted in a response rate of 49%. To identify whether the data exhibited non-response bias which otherwise can result in inaccurate conclusions, the suggestions put forward by Armstrong and Overton (1977) were followed to test for non-response bias. Accordingly, the first quartile of respondents (1 - 107) was compared

with the last quartile (319 – 426). This was achieved by comparing t-test values to reveal whether any significant differences were present between the groups. The t-test result revealed no difference between these quartiles ($p < 0.05$), indicating that non-response bias was not an issue in this study. To further maximise the validity of the study, the possibility of common method bias (CMB) was considered as the data was collected at the same time period using the same instrument throughout. This may therefore result in respondents answering in accordance with what is deemed socially desirable or what they expect the researcher to know (Podsakoff et al., 2003). However, as explained in chapter 3.6.4, several approaches were used to manage CMB, including; clear indication prior to the survey, no right or wrong answers ensuring anonymity throughout, and carrying out Harman's single factor test on each factor analysis conducted. The results showed no single factor accounted for more than 32.4% of the total variance extracted by one factor hence, it was less than the requirement of 50% (Podsakoff et al. 2012). Overall, these measures suggest that CMB should be unrelated in this study.

6.3 Profile Overview and Descriptive Analysis of Respondents

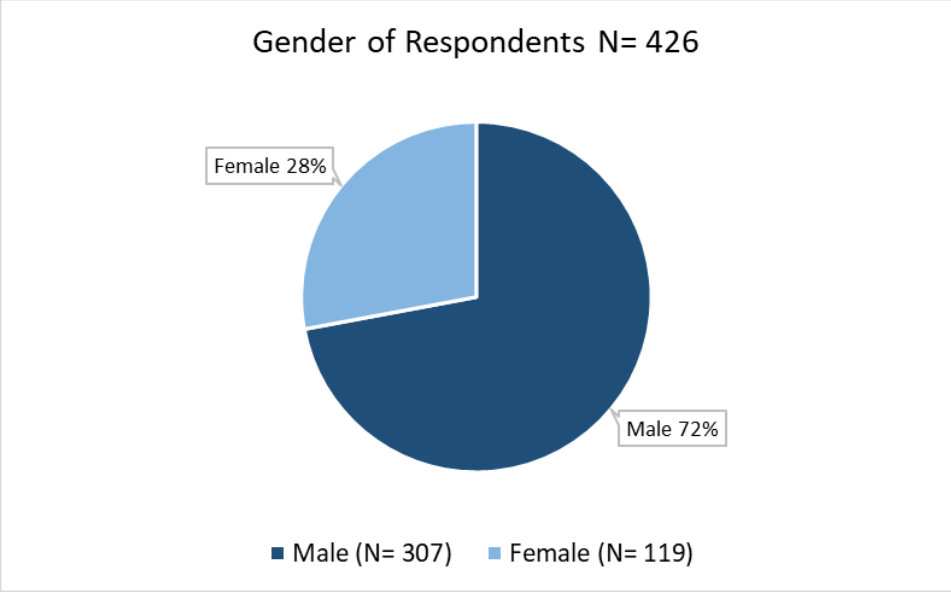


Figure 10 Respondents Gender

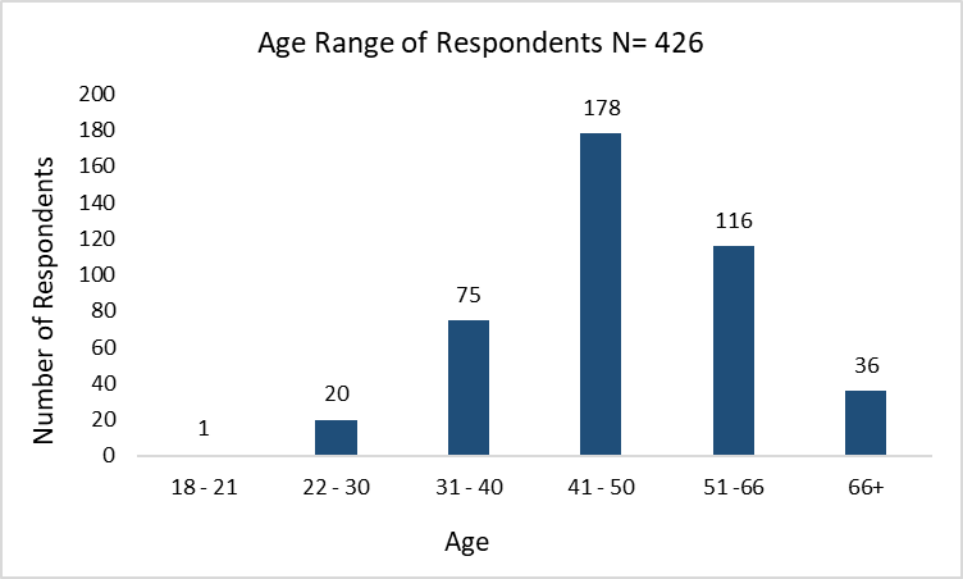


Figure 11 Age Distribution of Respondents

Of the 426 respondents collected as part of the main survey, there was a significant difference between the number of males and females who took part in this study. More specifically, 307 of the respondents (72%) were male, as compared to 119 (28%) female respondents who completed the survey. While the data show an uneven split in gender, this result echoes various conclusions made by scholars that males are more likely to own a BEV than females (Berkeley et al. 2018; Secinaro et al. 2022). Having said this, this finding paves an avenue for further research to investigate why the number of female BEV owners is not as high as that of males.

Figure 11 presents the respondents' age range. The majority of the respondents (42%) were aged between 41 and 50, and only 25% (n= 157) of respondents were aged 40 and below, coinciding with a recent study that also revealed the average age of a BEV owner is 40 and above (Fevang et al. 2021; Adu-Gyamfi et al. 2022). Although the age range on either side of the spectrum (those aged 66+ and below 30) represents some of the BEV owners' ages (13.3%, n= 57), this suggests that access to ownership of a BEV is not equally distributed among age ranges. One potential reason for this may be the purchase or lease cost of BEVs' implications, which will be reviewed in the following section.

Table 6.1 Demographic Characteristics of the Sample				
	Characteristics	**Category**	**Frequency**	**Percentage**
Demographic Related Responses	Employment Level	Employed	321	75.3%
		Self – Employed	88	20.7%
		Retired	10	2.3%
		Housewife/Husband	4	0.9%
		Volunteer	3	0.8%
	Education Level	Primary Education	1	0.2%
		Secondary Education	54	12.8%
		A levels/ College	92	21.6%
		Higher Education (bachelor's degree)	178	41.8%
		Postgraduate Education (master's or Ph.D.)	102	23.6%
	Annual Income (Gross)	£10k – 20k	3	0.70%
		£21k – 35k	12	2.8%
		£36k – 50k	42	9.9%
		£51k – 70k	117	27.5%
		£71k – 100k	130	30.5%
		£100k+	122	28.6%

Table 6.1 further provides information on the demographic profile of survey respondents within a given characteristic. It was revealed that the majority (75.3%, n= 321) were employed by a business or organisation or self-employed (20.6%, n= 88). On another note, 280 respondents (65.8%) held a bachelor's degree or higher (masters or Ph.D). Of the 426 total respondents for the survey, 369 (86.7%) responded that their annual gross income was at least £51,000 with 130, and 122 responded that their gross annual incomes were between £71,000 – 100,000 and £100,000 respectively. Overall, it is be said that typical BEV owner in Wales is someone who is employed, educated to a bachelor's degree, and earns approximately £50,000. When comparing employment status with the national average in Wales for each of these characteristics, not all

of these characteristics reflect the average individual in Wales. While in the latest data on employment levels between those aged 18 – 65 years reveal 72.4% were employed (Welsh Government 2023b), which is similar to that of the dataset in the study, the highest level of qualification obtained for this age range across the nation is 31.5%, which is 34.3% lower than the respondents of this study (Welsh Government 2023b). Moreover, it was revealed there is a significant difference between the national average wage in Wales (£33,887), and the majority of the respondents' salaries recorded in the survey (87.6% reporting annual incomes of over £50,000) (Welsh Government 2023a). This result indicates that access to ownership of a BEV is somewhat shaped by the individual's annual income which is plausible given the high purchase and lease costs of BEVs in the market.

Table 6.2 Responses Related to Car Ownership

	Characteristics	**Category**	**Frequency**	**Percentage**
Responses Relating to Car Ownership	Average Miles Driven / Week	0 – 50 miles	26	6.1%
		51 – 100 miles	30	7.0%
		101 – 150 miles	102	23.9%
		151 – 200 miles	125	29.3%
		201 – 250 miles	81	19.0%
		250 miles +	62	14.7%
	Ownership Type	Outright Purchase	160	37.6%
		Private Lease	116	27.2%
		Lease by Salary Sacrifice Scheme	102	23.9%
		Company Car	40	9.4%
		Car Share	8	1.9%
	Length of Ownership	Under 6 months	41	9.6%
		Between 6 months – 1 Year	77	18.1%
		Between 1 Year – 2 Years	201	47.2%

		Between 2 Year - 3 Years	32	7.5%
		Between 3 Year – 4 Years	47	11.0%
		4 years +	28	6.6%

Table 6.2 presents information about the respondents using their car. The majority of the participants (33.6%, N= 143) stated, on average, they drive between 150 and 200 miles each week, which is above the post COVID 19 pandemic national average of 144 miles (Department for Transport 2022). Moreover, 159 respondents drove more than 200 miles each week which coincides with the average number of miles any given BEV model after 2020 could achieve on a single full charge (Finnerty 2023). This suggests that not only do most BEVs seem to accommodate an individual's weekly mileage without frequent recharging, and that individuals are forming decisions to own a BEV based on their own evaluations that driving a BEV does not negatively impact the number of miles that need to be driven in any given week. In addition to this, while the majority of the participants interviewed in phase one indicated they own a car through a lease scheme, majority of the respondents of the survey 38% (N=160) stated their car was purchased outright. Finally, nearly half (47%, N= 201) stated they owned their existing BEV for at least one to two years with 25% of the respondents N= 107, owning their BEV for two years or more. The implications of this variable may play a significant role in the development of PO. This will be elaborated on further into the chapter.

Figure 12 below illustrates the various brands of BEV used by the respondents. Overall, 20 different car brands were recorded among the 426 respondents, indicating a wide range of interests of owners with different car brands participating in the study. As expected, given the popularity and success of its brand, 15% (n= 62) of the respondents owned a Tesla. This coincides with the results from the qualitative phase of the study where nearly 30% (7 out of 24) owned Tesla. Having said this, at the time of recording the survey responses, there are only two Tesla Supercharger networks across Wales as compared to the rest of the UK (92) (Tesla 2023). Hence, it is interesting to find a high percentage of Tesla owners in this sample despite not having direct access to its own charging network in Wales.

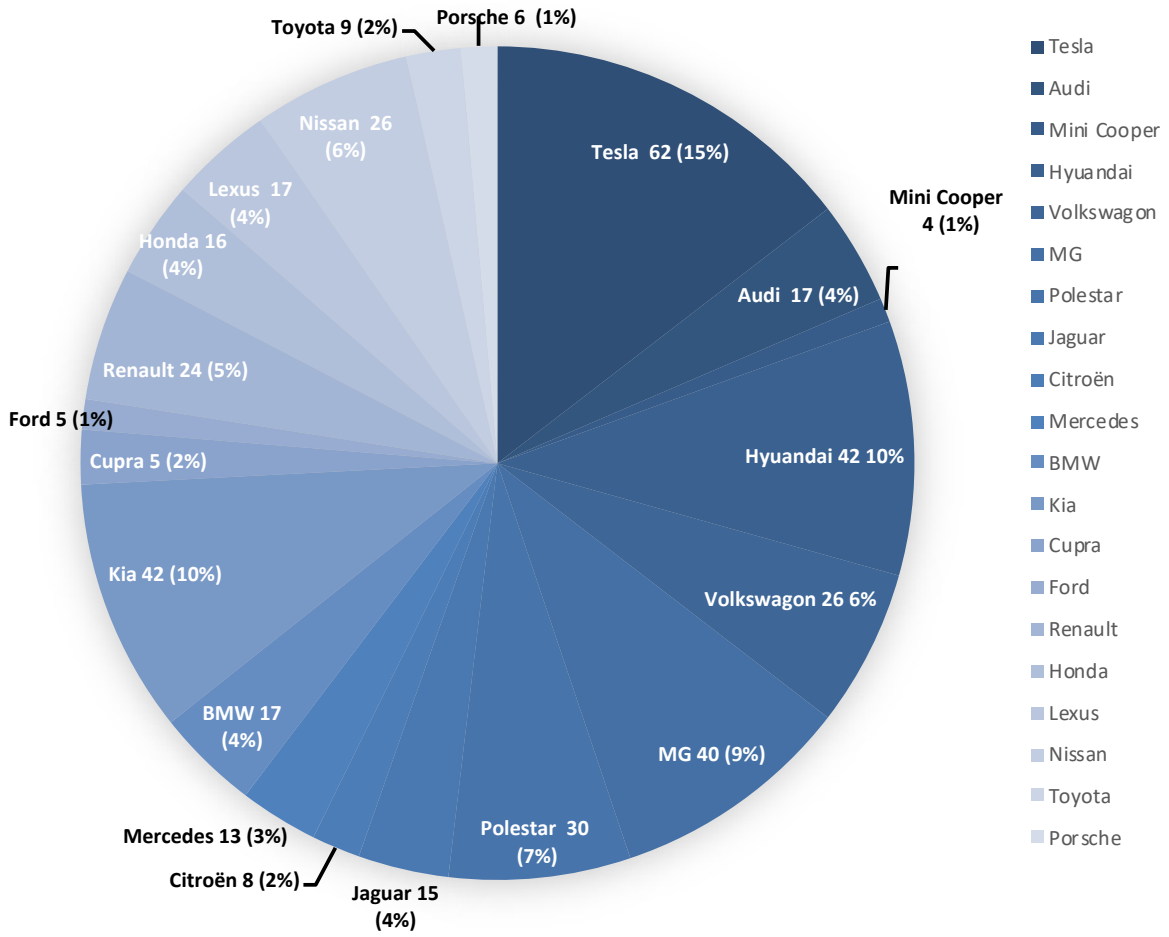


Figure 12 Distribution of Car Brands Among Respondents

Beyond this, there is variation in the other car brands in the sample, where mostly notably Hyundai and MG represent nearly 20% (19.2%, n= 82) of the respondents suggesting a degree of trust and reliability from the owners.

To better capture and understand the variation in car brand among the respondents, each car brand was categorised as either; mainstream, premium or luxury according to Brand Finance Automotive Industry report 2023 (Brand Finance 2023) (see Appendix J). Based on this, 218 (51.2%) respondents owned a BEV whose brand was considered mainstream. Interestingly, 130 respondents (30.5%) own a luxury branded BEV which in some ways reflect the findings

presented earlier on the demographics of the respondents where 252 (59%) stated they earn at least £70,000 annually.

Figure 13 below offers a further insight on this finding by illustrating the variation in car brands by type.

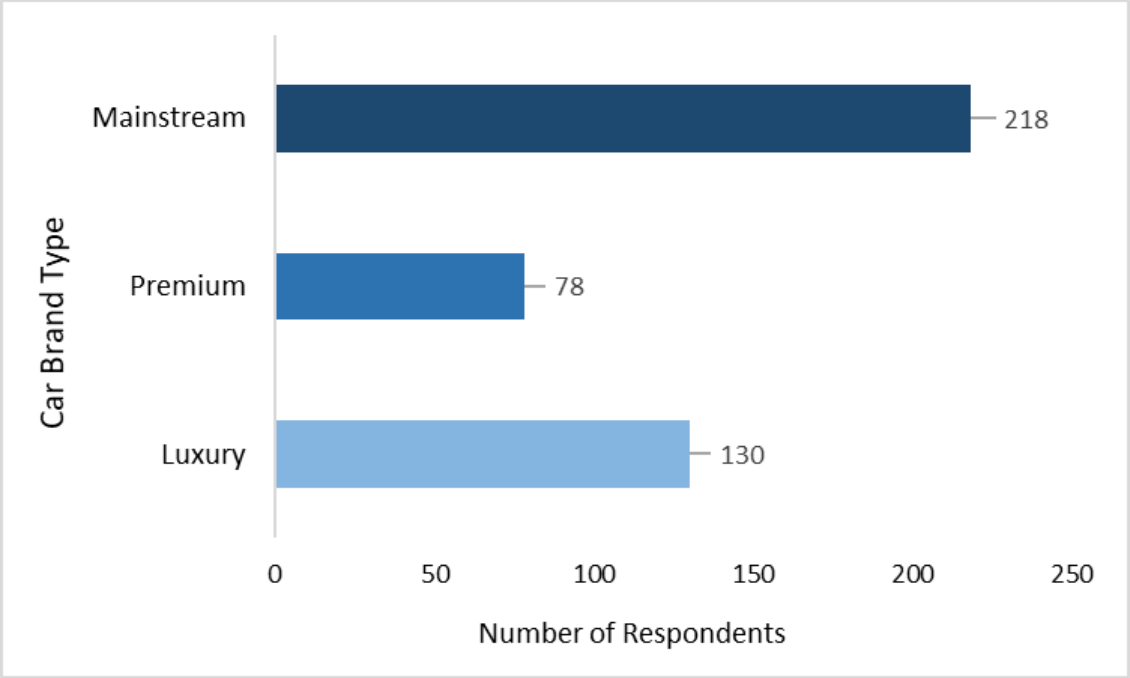


Figure 13 Variation in Car Brands

This result offers a glimpse into the differences in the purchasing power of BEVs among respondents. While the primary objective of this thesis is not centred on branding and brand choice, it provides an interesting avenue to extend the research and understand the motives for brand choice in the BEV market.

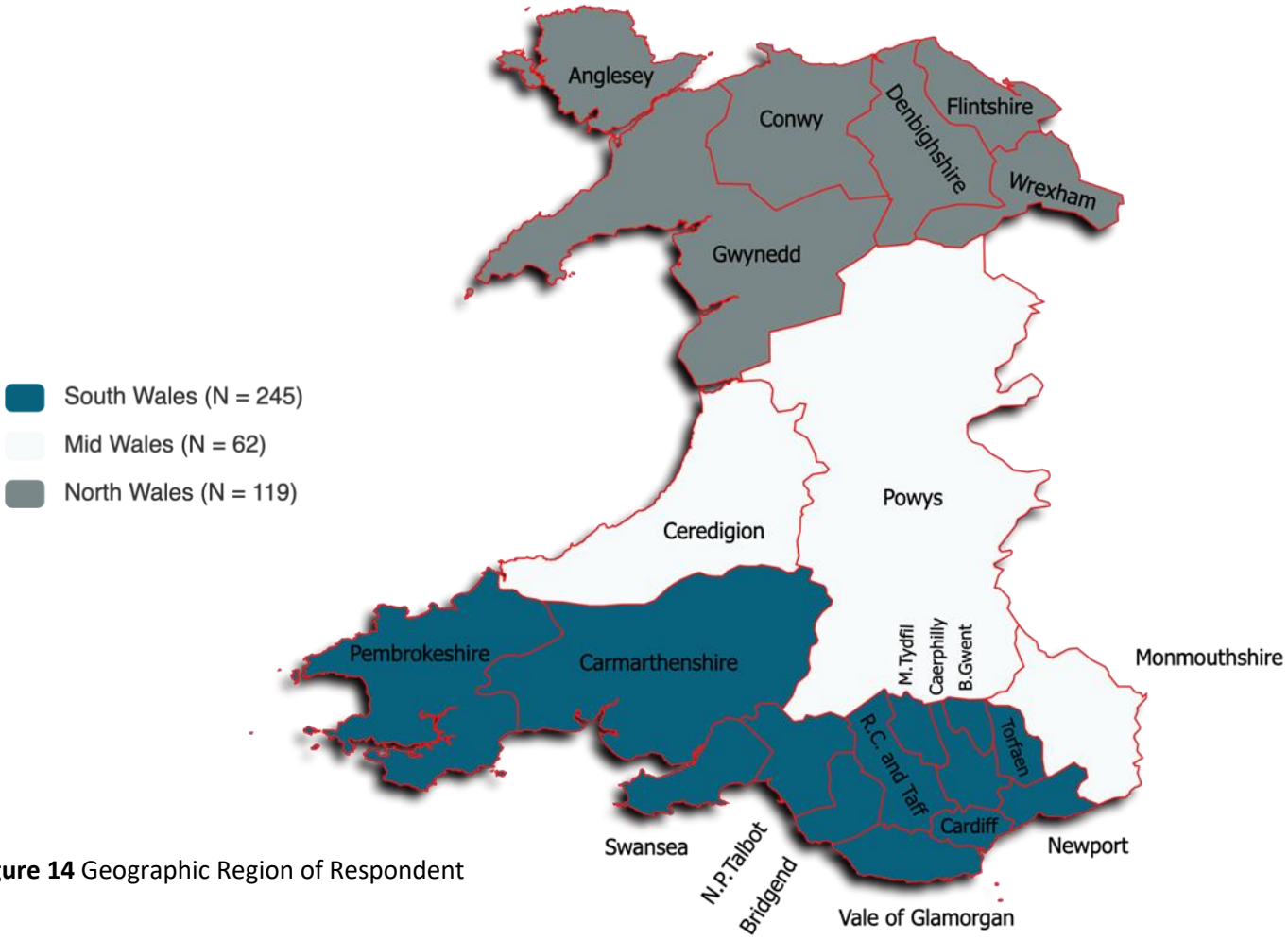


Figure 14 Geographic Region of Respondent

Figure 14 presents the various regions around Wales where the respondents resided. While the research aimed to capture a sample size with an equal number of participants between the; South, Mid, and North regions of Wales, many of the respondents, 58% (n= 245), were from South Wales, which is reasonable for two reasons. First because of the high population in Cardiff and Swansea which are two of the largest cities in Wales, with a combined population of approximately 700,000. Second, South Wales has the highest number of EV public chargers available (878 out of 1657) (Welsh Gov, 2021 Zapmap, 2023). Thus, it makes sense to find a higher number of BEV owners in these areas compared to other parts of Wales.
Conversely, in North Wales, 119 (28%) respondents resided in this region, hence the remaining 62 respondents (14%) were from Mid Wales. Without further examination of the participants' backgrounds, it would be difficult to propose a reason for this. However, one indication may centre on the number of public chargers available in North and Mid Wales (779 across both

regions as compared to 878 in South Wales alone) (Zapmap, 2023). This may explain the lack of respondents recruited from these regions, as there are perhaps fewer BEV owners among these areas.

6.4 Confirmatory Factor Analysis (CFA)

6.4.1 Pre-analysis Data Screening

The first step in the analysis involved screening the data to verify the usability of the datasets. This was necessary as without doing so introduces the risk of deriving biased results, while also facing potential complications with SPSS and AMOS software to produce valid results (Kline 2014; Pallant 2020). Accordingly, outliners were checked, and normality was assessed. The potential issue of missing data was addressed by including forced responses in the survey instruments. The rationale here was that only those who completed the survey in full were used and hence decreased the likelihood of missing data, as suggested by Albaum et al. (2010) and Sischka et al. (2022).

Outliers are “observations with a unique combination of characteristics identifiable as distinctly different from other the observations” (Hair et al. 2014, p.62). In other words, outliners can misrepresent the overall results by inflating the mean value away from the median. Outliers maybe univariate in nature whereby one variable has extreme values, or outliners maybe multivariate which indicates extreme values on two or more variables (Cain et al. 2017). Since the survey used a seven-point Likert scale, the data did not reveal univariate outliers since answering either end of (1- 7) is not representative of outlier behaviour. Nonetheless the dataset revealed a number of multivariate outliners, however the decision to retain the cases was made for the following reasons. First, these outliners capture the targeted population and therefore some respondents may have responded differently to the same questions in comparison to most of the respondents but still represent the target population. Second, scholars such as Kline (2014), Edmonds and Kennedy (2017) and Hoyle (2023) suggest several outliners in a large sample size should be seen as a minor issue and that the researcher should decide whether to retain or remove these outliers. This coincides with the view of Hair et al.

(2014, p.65), who argue removing outliers may reduce the “risk of improving the multivariate analysis but limits its generalisability”. Hence a decision to retain outlying observations was made.

Normality is one of the most important assumptions in multivariate analyses. It is characterised by the shape of the data distribution for a particular variable and its correspondence to a normal distribution (Hair et al. 2010). Assessment of normality in the data can be achieved using multiple techniques, including; graphical representation of the data using a histogram to show distribution shape, or a normal probability plot that compares the cumulative distribution of actual data with a normal cumulative distribution. Additionally, and more commonly in consumer behaviour based research, statistical tests are conducted by calculating the skewness and kurtosis values. As described by Cain et al. (2017) skewness accounts for the balance of distribution and shows how much the probability distribution of a random variable is unbalanced and shifts to one side from the normal distribution. Kurtosis however, measures the ‘tailedness’ of the of distribution to indicate how tails of the data distribution differ from the tails of a normal distribution Cain et al. (2017). As recommended by Hair (2010) and Manly and Alberto (2017) the skewness and kurtosis values should fall within the ranges of -2 to + 2 and -7 to +7 respectively. Further, Kline (2014) and Pallant (2020) believe that if absolute values for the skew index are greater than three this is considered extreme and if kurtosis values are larger than 7 are deviated from normality.

Table 6.3 presents the results of skewness and kurtosis for the main dataset and shows that none of the variables exceed the guidelines suggested by Hair (2010) and Manly and Alberto (2017). Since the items are normally distributed in the dataset, transforming non-normally distributed variables is not necessary, as this can otherwise pose further issues by changing the interpretation of the original responses (Cain et al. 2017, Pallant 2020).

Table 6.3 Skewness and Kurtosis Results					
Item	Skewness	Kurtosis	Item (continued)	Skewness	Kurtosis
CTA01	-.602	.238	CP02	-.599	-.030
CTA02	-.540	.552	CP03	-.532	-.095
CTA03	-.767	.796	CP05	-.448	-.227
CTA04	-.892	1.056	CP08	-.782	.418
CTA05	-.805	.837	CP09	-.299	-.142
CTA06	-.718	.811	CP010	-.500	.014
CTA07	-.694	.658	CP013	-.531	-.098
CTA09	-.306	-.293	CP014	-.592	-.212
CTA10	-.436	-.472	HP02	.636	-.084
CTA11	-.368	-.279	HP03	.674	.453
EC01	-.679	.524	HP04	.512	-.809
EC03	-.883	.738	HP07	.467	-.168
EC04	-.682	.264	HP08	.539	-.686
EC05	-.752	.111	AP01	-.615	.271
EC07	-.712	.250	AP02	-.491	-.051
EC08	-.786	.218	AP03	-.617	.369
EC09	-.774	.420	AP06	-.780	.639
EC011	-.495	-.531	APRI01	-.715	.251
EC012	-.523	.182	APRI02	-.459	-.279
IPO1	-.633	.440	APRI04	-.754	.242
IPO2	-.848	.765	APRI05	-.981	.689
IPO3	-.829	.918	WOM01	-.925	-.353
IPO4	-.830	.369	WOM02	-1.091	.692
CPO01	-.707	.451	WOM03	-.821	.780
CPO02	-.444	-.213	PS01	-.577	.122
CPO03	-.614	-.235	PS02	-.491	.997
CPO04	-.783	.423	PS03	-1.026	1.491
MP01	-.848	.502			
MP02	-.930	1.161			
MP04	-.515	-.129			

6.4.2 Evaluation of Measurement Model

This section of the chapter describes the results obtained after performing CFA on the main survey dataset to validate the proposed model (Kline, 2014). Unlike the steps carried out with

EFA with the pilot study dataset, the focus of CFA was to prepare for hypothesis testing by determining if a high correlation between the observed items and latent constructs is present (Hair 2010). Brown (2015) suggests that EFA procedures such as calculating the alpha coefficient, item - total correlation and factor rotation values, do not assess construct validity, which is regarded as a significant condition to ensure valid measurements. Hence, the need to carry out CFA is highly recommended to ensure that a robust study is conducted by identifying whether scale items cross-load on other constructs in the model. Additionally, since CFA is theory driven, it allows a researcher to verify if the observed variables hypothesised accurately represent the extent to which the collected data set confirms what is theoretically believed to be its underlying constructs (Hatcher and O'Rourke 2014; Kline 2014). CFA analysis was conducted on the theoretical model developed based on the interview findings obtained during the qualitative phase of this study and the literature review. The analysis employed maximum likelihood procedures following the recommendations (Hair 2010; Hoyle 2023). Accordingly, the model was assessed by examining the reliability, unidimensionality, discriminant and convergent validity as specified in chapter 3.6.4.

The measurement model consisted of 11 exogenous variables and 57 indicators. The 11 exogenous variables are; Consumer Technology Appropriation (CTA), Environmental Concern (EC), Individual Psychological Ownership (IPO), Collective Psychological Ownership (CPO), Activated Product Related Identity (APRI), Word-of-Mouth (WOM), Product Satisfaction (PS), Authentic Pride (AP), Moral Pride (MP), Hubristic Pride (HP) and Collective Pride (CP). Figure 15 shows the pathway diagram to visually represent the measurement model and the correlation amongst the latent variables. The diagram includes four types of symbols. Latent (unobserved) variables are denoted by ellipses, measurement errors are represented by small circles, observed variables are represented by rectangles, and single-headed arrows (⟶) shows how one variable impacts the other whilst the double arrows (⟷) correspond to the correlations between variable pairs.

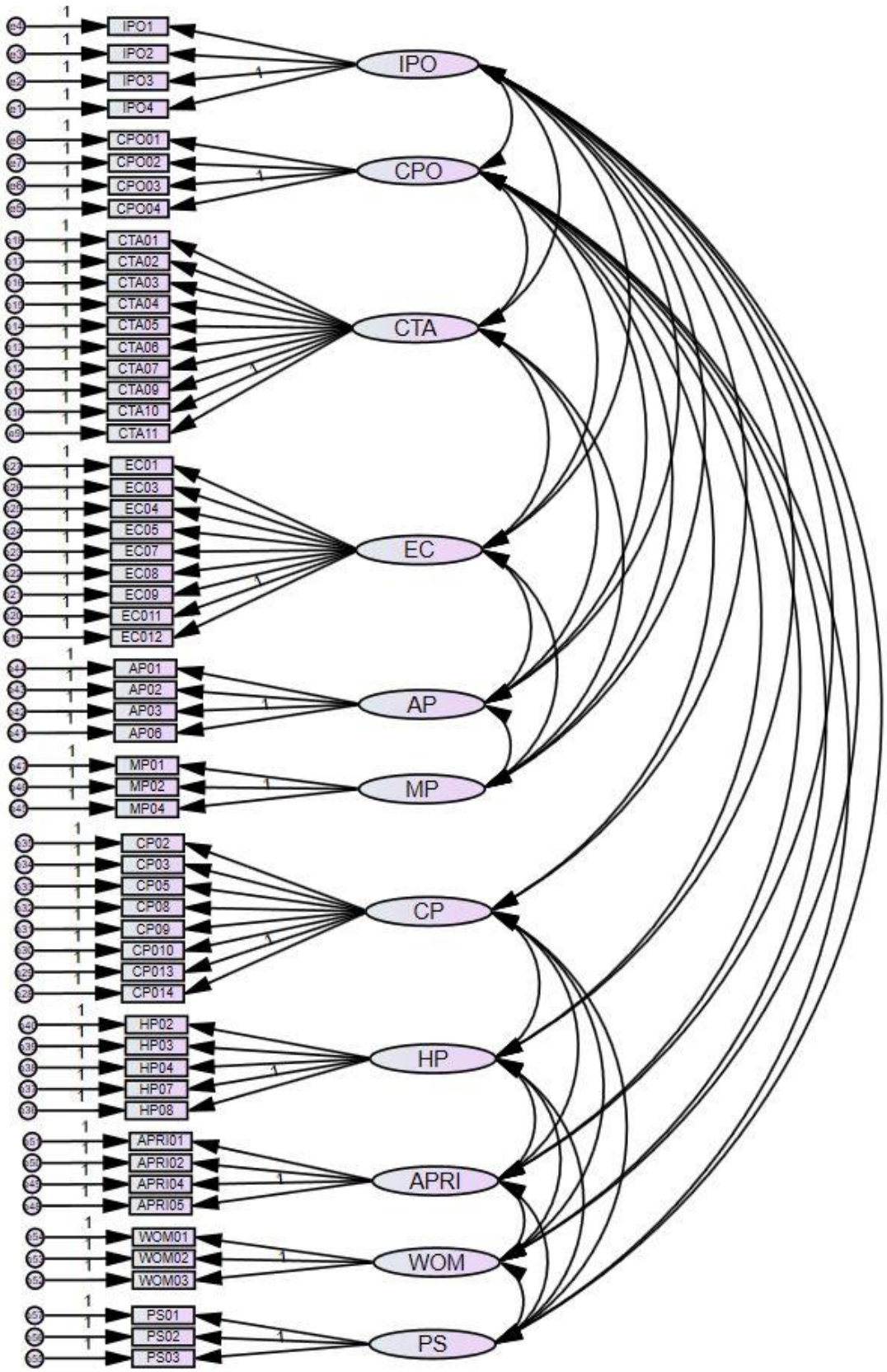


Figure 15 Measurement Model Path Diagram

Table 6.4 Summary of Goodness-of-Fit Indices			
Fit Index	**Indicators Used**	**Description**	**Acceptable Fit**
Absolute fit	Chi-Square (χ2)	Assesses overall fit and discrepancy in covariance structural models.	Non-significant χ2 with a p-value ≥0.0.5.
	Minimum discrepancy (CMIN/DF)	Similar to χ2 but more accurate as chi-square is divided by degree of freedom.	If CMIN/DF value is ≤5 indicates reasonable fit and ≤ 3 indicates acceptable fit.
	Goodness-of-Fit Index (GFI)	Measure the fit of the proposed model and the observed covariance matrix.	Value of 1 indicates perfect fit, ≥0.9 is acceptable how is dependent on sample size and model complexity.
Incremental Fit	Comparative Fit Index (CFI)	Measures discrepancy between the data and the proposed model.	Value of 1 indicates perfect fit, ≥0.9 is acceptable.
	Tucker-Lewis coefficient (TFI)	Considers model complexity in a non-normed manner such that values can fall above one or below zero.	
Parsimony Fit	Parsimony Normed Fixed Index (PNFI)	Considers how well a model achieves goodness-of-fit for each estimated coefficient.	Although there is no commonly agreed-upon cut off value, as suggested by Hair et al. (2010) should be ≥0.50.
	Root Mean Square Error of Approximation (RMSEA)	Represents how well a model fits a population	Values closer to 0 represent good fit, ≤ .05 is considered acceptable.

Sources: (Hair et al. 2010; Kline 2014; Hoyle 2023)

To measure the model, 57 items from the main survey were used to perform CFA to assess validity, dimensionality, and reliability. Accordingly, the results of the standardised regression weights, R^2 values and three types of model fit (goodness-of-fit indicators) were used to determine how well the model matched the observed (empirical) data. As outlined in chapter 3.5.5, the three types of model fit measures used in the study are: absolute fit indices, incremental fit indices, and parsimony fit indices (Hair et al. 2010). Table 6.4 presents a description of each of these alongside the respective goodness-of-fit indicators used in the study and its suggested acceptable values:

In the first run of the CFA, the model did not achieve all the required values in the standardised regression weight and R2 values, hence failing to meet the minimum acceptable values for model fit. As a result, the following four items were dropped due to low loadings and the CFA was run again: (CTA04, EC01, CP09, and HP03). Consequently, after running CFA again, this showed elimination of these four items positively improved model fit from: CMIN/df=2.7; GFI= 0.89; CFI= 0.91; TFI= 0.90; PNFI=0.72; RMSEA=0.054 for the initial model to CMIN/df= 2.1; GFI=0.95; CFI= 0.93; TFI= 0.94; PNFI=0.85; RMSEA=0.046 for the re-specified model.

Following the assessment of model validity, convergent validity assessments were conducted. The results shown in table 6.5 below show the re-specified model was deemed to be satisfactory as all standardised regression weightings loaded above 0.7 (expect MP01, which is still acceptable as it is above the minimum value of 0.5 and just slightly under the recommended value of 0.7) and achieved high statistical significance (greater than +/-1.96) at $p<0.05$ as suggested by (Anderson and Gerbing 1988 ; Hair et al. 2010). Moreover, for each construct, the composite reliability (CR) values were greater than 0.7, with an average of variance extracted (AVE) greater than 0.5, which are above the acceptance level as discussed in chapter 3.5.5. Accordingly, the CR and AVE values indicate that the model meets the requirements for validity, reliability, and unidimensionality as argued by (Hair 2010; Hatcher and O'Rourke 2014; Hoyle 2023).

Table 6.5 presents the results of CFA, suggesting that the model is robust as all goodness-of-fit indices exceed acceptable levels while also scoring above 0.7 and 0.5 for CR and AVE respectively. Thus, the proposed model achieved a good model fit with acceptable validity measures.

Table 6.5 CFA Results for Measurement Model						
		Standardised Regression Weight	**Critical Ratio** (t-value) ***P<0.001	**R^2**	**Composite Reliability**	**Average Variance Extracted**
Construct		**≥0.5**	**±1.96**	**≥0.5**	**≥0.7**	**≥0.5**
Consumer Technology Appropriation (CTA)	CTA01	0.82	18.54***	0.67	0.96	0.73
	CTA02	0.75	15.90***	0.56		
	CTA03	0.81	18.47***	0.66		
	CTA05	0.86	28.58***	0.74		
	CTA06	0.87	28.03***	0.76		
	CTA07	0.90	30.58***	0.81		
	CTA09	0.86	25.69***	0.74		
	CTA10	0.84	20.12***	0.71		
	CTA11	0.88	29.25***	0.77		
Environmental Concern (EC)	EC03	0.89	30.06***	0.79	0.95	0.68
	EC04	0.87	18.92***	0.76		
	EC05	0.90	32.44***	0.81		
	EC07	0.87	-------	0.76		
	EC08	0.91	31.85***	0.83		
	EC09	0.84	20.11***	0.71		
	EC011	0.82	19.45***	0.67		
	EC12	0.85	24.73***	0.72		
Individual Psychological Ownership (IPO)	IPO01	0.75	15.91***	0.56	0.85	0.66
	IPO02	0.82	-------	0.67		
	IPO03	0.79	17.66***	0.62		
	IPO04	0.86	18.88***	0.74		
Collective Psychological Ownership (CPO),	CPO01	0.81	18.62***	0.66	0.92	0.75
	CPO02	0.79	17.68***	0.62		
	CPO03	0.90	-------	0.81		
	CPO04	0.85	19.03***	0.72		
Activated Product Related Identity (APRI)	APRI01	0.77	16.78***	0.59	0.94	0.78
	APRI02	0.83	18.54***	0.69		
	APRI03	0.73	14.51***	0.53		
	APRI04	0.75	------	0.56		
Word-of-Mouth (WOM),	WOM01	0.84	23.59***	0.71	0.84	0.80
	WOM02	0.88	-------	0.77		
	WOM03	0.91	31.61***	0.83		

Product Satisfaction (PS),	PS01	0.90	31.85***	0.81	0.78	0.71
	PS02	0.92	33.2***	0.85		
	PS03	0.89	29.33***	0.79		
Authentic Pride (AP),	AP01	0.87	26.13***	0.76	0.93	0.77
	AP02	0.84	-------	0.71		
	AP06	0.82	22.43***	0.67		
Moral Pride (MP)	MP01	0.69	14.39***	0.48	0.88	0.72
	MP02	0.74	14.98***	0.55		
	MP04	0.86	-------	0.74		
Hubristic Pride (HP)	HP02	0.85	24.88***	0.72	0.86	0.63
	HP04	0.89	31.26***	0.79		
	HP05	0.91	34.75***	0.83		
	HP08	0.89	30.94***	0.79		
Collective Pride (CP)	CPO02	0.90	31.08***	0.81	0.93	0.75
	CPO03	0.75	15.90***	0.56		
	CPO05	0.88	29.33***	0.77		
	CPO08	0.93	33.85***	0.86		
	CPO10	0.92	33.02***	0.85		
	CPO13	0.86	25.17***	0.74		
	CPO14	0.91	23.55***	0.83		

Overall Goodness-of-Fit Indices

Acceptance Level	**Statistical Significance p < 0.05**	**CMIN/df** Range 1- 3	**GFI** ≥0.9	**CFI** ≥0.9	**TFI** ≥0.9	**PNFI** ≥0.50	**RMSEA** ≤ 0.05
Initial Model	χ2 = 5362.246; df=1986; p <0.0	2.7	0.89	0.91	0.90	0.72	0.054
Re-specified Model	χ2 = 3154.898; df=1504; p <0.0	2.1	0.95	0.93	0.94	0.85	0.046

6.5 Hypothesis Testing with Direct, Mediation and Moderation Effects

This section is divided into three parts: the first presents the results from testing the relationship of the predictors of both IPO and CPO using hierarchical multiple regression. Following this mediation analysis using PROCESS, macro Models 4 and 6 were used to test the role of; authentic pride and moral pride as mediators between IPO and CPO, respectively (Model 4), before testing the serial mediation effect of authentic pride and IPO on each outcome outline in the theoretical model of this study and then moral pride, IPO and CPO on the same three outcomes using Model 6. Finally, mediation moderation analysis was conducted to test the moderating effect of hubristic and collective pride using Model 87.
Throughout the analysis, the same four control variables were used as these could cofound the results; gender (male= 1, female= 0) ownership type (ranges from 1= outright purchase, 2= private lease, 3= lease by salary sacrifice scheme, 4= company car and 5= car share), car brand (1= luxury, 2= premium and 3= mainstream) and length of ownership (ranging from 1= under 6 months, 2= between 6 months and 1 year, 3= between 1-2 years, 4= between 2-3 years, 5= between 3-4 years and 6= 4 years +).

6.5.1 Measuring Predictors of IPO

For this regression, the dependent variable was IPO while the independent variables were; using the plug-in to charge system, interacting with smartphone application, autonomous driving features, attachment feelings towards the environment, assumed responsibility and moral obligation. The former three relate to and capture consumer technology appropriation while the latter three variables relate to environmental concern. Therefore, the purpose of the analysis was to establish the relationship and the measures between each of the six variables on IPO to verify the hypothesis and present which predictor most impacts feelings of IPO towards a BEV.

Table 6.6 presents the regression results, where Model 1 shows the influence of the control variables on IPO, while Model 2 includes both the control variables and the 6 independent variables to clearly distinguish whether the outcome is influenced by the control variables.

Table 6.6 Coefficients Results for the Direct Effects of Consumer Technology Appropriation and Environmental Concern on IPO			
	IPO		**Hypothesis**
	Model 1	Model 2	
Gender	0.025	0.053	
Ownership Type	0.018*	0.025*	
Car Brand	0.025	0.023	
Length of Ownership	0.054	0.049	
Plug in to Charge System	-	0.373*	H1A Supported
Smartphone Interaction	-	0.325**	H1B Supported
Autonomous Driving Features	-	-0.136*	H1C Supported
Feelings of Attachment Towards Environment	-	0.084	H3A Rejected
Assumed Responsibility	-	0.235**	H3B Supported
Moral Obligation	-	0.281*	H3C Supported
R^2	0.114	0.442	
R^2Change	-	0.357	
F Change	F(4,352) = 8.615	F(6,346) = 16.438**	
Variance Inflation Factor (VIF)	1.006 – 1.032	1.028 – 1.776	
Note: Dependent variable = IPO, results are standardized regression coefficient, n= 426, * p <0.05, ** p < 0.01.			

The overall model depicts 44.2% (R^2 = 0.442) of the total variance in IPO accounted for by all the predicators, including the control variables. However, 35.7% of IPO variance is explained by 6 independent variables. Almost all the control variables did not have a statistically significant

influence on IPO, where $p > 0.05$ except for ownership type where this was statistically significant at $p < 0.04$. This suggests differences between those that; outright bought their car, own a BEV through a private lease agreement; own their BEV through a salary sacrifice scheme, own a BEV through company car scheme, and car share each have a different impact on developing feelings of IPO. This is consistent with Belk (2014b) and Magnani and Re (2020) who suggest those that outright bought their car, that is, own full legal ownership, as opposed to borrowing or leasing, have the strongest feelings of PO over possessions in particular cars. Hence, the results shown in Model 2 describe the direct effect of the independent variable on the dependent variable, with the influence of ownership type affecting the model.

The independent variables significantly predicted IPO, $F(6,346) = 16.438$, $p < 0.01$ indicating the predictors being tested have a significant impact on the feelings of IPO to develop towards their car. H1A evaluates whether feelings in control over the plug-in to charge system positively affects IPO. The results show there is a significant and positive relationship between these variables ($B=0.373$, $p<0.01$). Hence, H1A is supported, and consumer technology appropriation positively impacts IPO when the individual feels in control of how the charging system works in the BEV. H1B measured whether interacting with the smartphone application linked to the car increased feelings of IPO. The results again showed a significant and positive relationship ($B=0.325$, $p<0.01$) thus H1B was supported that consumer technology appropriation positively impacts IPO when the individual interacts with their BEV using the smartphone application. H1C evaluates whether the use of autonomous driving features decreases the feelings of IPO. The results support the hypothesis that there is a significant and negative relationship between using autonomous driving features and IPO ($B= -0.136$, $p<0.05$) hence, H1C was supported. In other words, appropriation of consumer technology negatively impacts IPO when an individual interacts with the autonomous driving features. Therefore, it can be said that the overall appropriation the BEV technology not only drives feelings of IPO, but is most impacted when the individual feels in control over the plug-in charge system of their car.

As for the predictor of environmental concern, H3A measured whether feelings of attachment towards the environment influenced feelings of IPO. The results showed a non-significant

relationship (B=0.084, p>0.05) thus, the null hypothesis was accepted and H3A was rejected. Hence, BEV owners who express feelings of attachment to the natural environment do not instigate feelings of IPO towards their car. As for H3B, which evaluates whether feelings of assumed responsibility positively impact IPO, the results showed a significant positive relationship (B=0.235, p <0.01) hence H3A was supported. Thus, BEV owners who assume a sense of responsibility towards preserving the natural environment do in fact instigate feelings of IPO towards their car. Finally, H3C measured whether a positive relationship exists between feelings of moral obligation and IPO. The results showed a significant relationship (B=0.281, p>0.05) thus, the null hypothesis was rejected and, H3C was accepted. In other words, BEV owners who feel a sense of moral obligation to take care of the natural environment do instigate feelings of IPO towards their car as hypothesised. Overall, for the environmental concern variable, individuals who assume feelings of responsibility and feel a moral obligation to preserve the natural environment are likely to develop feelings of ownership over their car.

6.5.2 Measuring Predictor of Environmental Concern on CPO

For this regression, the dependent variable was CPO, while the independent variables were the same as those used to inform environmental concern in the previous regression analysis; attachment feelings towards environment, assumed responsibility and moral obligation. Therefore, the purpose of the analysis was to establish the relationship and the measures between the three independent variables on CPO and test the proposed hypothesis.
Table 6.38 presented the results from the hierarchical multiple regression to test whether feelings of attachment towards the environment, assumed responsibility, moral obligation significantly predicted feelings of CPO over the BEV owner's community.

Table 6.7 Coefficients Results for the Direct Effects of Environmental Concern constructs on CPO			
	CPO		**Hypothesis**
	Model 1	Model 2	
Gender	-0.057	-0.034	
Ownership Type	0.074	0.051	
Car Brand	-0.062	.0088	
Length of Ownership	-0.11	0.022	
Feelings of Attachment Towards Environment	-	0.180**	H3D Supported
Assumed Responsibility	-	0.287**	H3E Supported
Moral Obligation	-	0.242**	H3F Supported
R^2	0.105	0.396	
R^2Change	-	0.340	
F Change	F(4,352) = 5.215*	F(3,349) = 26.293**	
Variance Inflation Factor (VIF)	1.006 – 1.032	1.007 – 1.772	
Note: Dependent variable = CPO, results are standardized regression coefficient, n= 426, * p <0.05, ** p < 0.01.			

The overall model showed that 39.6% of the total variance in CPO was caused by the predictors, including the control variables used. Thus, 34% of the variance in CPO can be explained by the 3 predictors. The results show that none of the control variables had a statistically significant influence on CPO, since p > 0.05 for all control variables. Hence, the results shown in Model 2 describe the direct effect of the independent variables on CPO without the influence of external variables affecting the model.

The independent variables significantly predicted CPO, F(3,349) = 26.293, p <0.01, indicating the predictors being tested had an impact on feelings of CPO to develop towards the BEV owner's community. H3A evaluates whether feelings of attachment towards the environment positively

affect feelings of CPO. The results show a significant and positive relationship between these variables (B=0.180, p<0.01). Hence H3D, was supported, which stated BEV owners that collectively share feelings of attachment towards the natural environment with other BEV owners develop feelings of CPO towards the BEV owner's community.

H3E measured whether feelings of assumed responsibility to preserve the natural environment increased feelings of CPO. The findings show a significant and positive relationship (B= 0.287, p<0.01) thus H3B was supported. Therefore, arguing BEV owners who collectively share a sense of responsibility towards preserving the natural environment with other BEV owners, develop feelings of CPO towards the BEV owner's community.

Finally, H3F evaluates whether feelings of holding moral obligations to preserve the natural environment are predictors of feelings of CPO to arise towards the BEV owner's community. The results supported the hypothesis that there is a significant relationship between these variables (B= 0.242, p <0.05) and H3F was supported. Hence, BEV owners that collectively share feelings of moral obligation to preserve the natural environment with other BEV owners, lead to developing feelings of CPO towards the BEV owner's community. Overall, it can be said that feelings of attachment towards the environment, feelings of assumed responsibility and moral obligation to preserve the environment are significant and positively impact feelings of CPO to develop towards the BEV owner's community.

6.5.3 Measuring the Outcomes of Individual and Collective PO

To test the outcomes of IPO and CPO, a series of hierarchical regressions were used for each respective outcome (activated product related identity, word-of-mouth and product satisfaction). Thus, in addition to IPO and CPO, gender, ownership type, car brand, and length of ownership were included as control variables throughout as they could cofound the results. Table 6.8 below shows presents the regression results that testing hypothesise H5A, H5B, H6A, H6B, H7A, H7B.

Table 6.8 Coefficients for Outcomes of Individual and Collective PO							
	Model 1 Activated Product Related Identity		**Model 2 Word-of-Mouth**		**Model 3 Product Satisfaction**		**Hypothesis**
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	
Gender	0.016	0.027	0.078*	0.086*	0.043	0.051	
Ownership Type	0.068	0.041	0.039	0.027	0.21	0.012	
Car Brand	0.027	0.004	0.073*	0.090*	0.062*	0.075*	
Length of Ownership	-0.060	-0.044	0.007	0.014	0.015	0.031	
IPO	-	0.445**	-	0.528**	-	0.424**	- H5A Supported - H6A Supported - H7A Supported
CPO	-	0.285 (n.s)	-	0.365**	-	0.421*	- H5B Not Supported - H6B Supported - H7B Supported
R^2	0.015	0.395	0.108	0.421	0.115	0.459	
R^2 Change	-	0.285	-	0.367	-	0.352	
F Change	F(4,352) = 12.615	F(2,350) = 35.991**	F(4,352) = 1.178	F(2,350) = 17.359**	F(4,352) = 0.492	F(2,350) = 19.638**	
Variance Inflation Factor (VIF)	1.006 – 1.032	1.010 – 1.091	1.006 – 1.032	1.010 – 1.091	1.006 – 1.032	1.010 – 1.091	
Note: Results are standardized regression coefficient, n= 426, * p <0.05, ** p < 0.01.							

Before presenting the results, it is important to rule out the possibility of multicollinearity effects, which were assessed by measuring the Variance Inflation Factor (VIF) which assesses collinearity among predictor variables in multiple regression analysis (Hair et al. 2020). For each model 1, 2 and 3 the VIF was not above 1.5, hence suggesting no collinearity concerns (Hair et al. 2020, Pallant 2016). For all three models, the VIF ranges from 1.006 – 1.091 suggesting the regressions analysis was not highly correlated.

For Model 1 activated product related identity, 39.5% of the total variance is accounted for by all predicators including the control variables where as 28.5% (R^2 change) of the total variance denotes only the main predicators; IPO and CPO. Interestingly, none of the control variables had a statistically significant influence on activated product related identity as $p > 0.05$. Nonetheless, IPO was statistically significant ($b= 0.445$, $p<0.01$), suggesting that feelings of IPO towards the car drives activated product related identity hence supporting H5A. However, feelings of CPO did not have a statistically significant impact on activated product related identity ($b=0.285$, $p >0.05$) thus rejecting H5B. This finding contradicts that of Szamatowicz and Paundra (2019) who otherwise posited feeling of collective ownership experienced with others can lead to identity changes within group members, which reflects the group goals, commitment, and identity. Overall, it is the feelings of IPO that are more likely to impact activated product related identity than CPO. Having said this, it is possible that feelings of collective pride may impact this relationship this which will be tested later in the chapter.

In Model 2 which denotes word-of-mouth as the outcome, 42.1% of the total variance was accounted for by all predicators including the control variables. Of this, 36.7% (R^2 change) of the total variance was accounted for by both IPO and CPO. Among the control variables, car brand was found to have a statistically significant impact on word-of-mouth ($b= 0.091$, $p<0.05$) suggesting depending on whether the brand of the car is classified as a luxury, premium or mainstream brand affects the level at which word-of-mouth communication takes place. This echoes findings by Athwal et al. (2019) who also found differences in luxury and non-luxury brands have different effects on word-of-mouth. Additionally, gender was found to have a statistically significant impact on word-of-mouth ($b= 0.086$, $p<0.05$).

As for the predictor of IPO, this was found to have a positive and statistically significant impact on word-of-mouth (b= 0.528, p<0.01) hence suggesting, BEV owners who feel high levels of IPO towards their car, are more likely to speak positively about their ownership experience through word-of-mouth communication thus supporting H6A. When comparing this result to feelings of CPO as the predictor, this has a weaker effect than IPO on word-of-mouth as the results show b= 0.365, p<0.01. Hence, BEV owners who share CPO feelings towards the BEV owner's community, are more likely to engage in word-of-mouth communication to promote and praise the collective commitments and efforts made supporting hypothesis H6B. Between IPO and CPO as predictors, PO at an individual level has a greater impact on word-of-mouth communication (b=0.528) than CPO (b=0.365).

Finally, Model 3 presents the regression results when product satisfaction is the outcome. Here, 45.9% of the total variance was accounted for by all predicators, including the control variables. However, 35.2% (R^2 change) of the total variance was accounted for by both IPO and CPO. From the control variables included, car brand was again found to have a statistically significant impact on product satisfaction (b= 0.075, p<0.05) suggesting that depending on the different classification of brands (luxury, premium or mainstream) this affects the level of satisfaction of the BEV ownership experience. Moreover, IPO as a predictor had a positive and statistically significant impact on product satisfaction (b= 0.424, p<0.05) suggesting, BEV owners who develop feelings of IPO towards their car are more likely to feel satisfied with their BEV, thus supporting H7A. In comparison, when CPO is the predictor, the results show (b=0.421, p<0.01) thus, CPO has a stronger effect on product satisfaction than IPO. Nonetheless, the results indicate a significant positive relationship between BEV owners who report high feelings of CPO towards the BEV community and levels of satisfaction with owning a BEV, thus supporting H7B.

6.5.4 Testing Mediating and Moderating Effects of Pride

This section presents the mediation and moderation analyses conducted to test the hypotheses concerning the mediation and moderation effects. In summary, Model 4, Model 6 and Model 87 from PROCESS macro were used to test these effects.

For the first part of the analysis, three sperate PROCESS macro Model 4 were used. First,

Consumer Technology Appropriation (predictor) on IPO (outcome) through Authentic Pride (mediator) was tested. Subsequently, environmental concern (predictor) on IPO (outcome) through Moral Pride (mediator) was tested. Finally, environmental concern (predictor) on CPO (outcome) through Moral Pride (mediator) was tested. Subsequently, PROCESS macro Model 6 was then used to test the serial mediating effects of authentic and moral pride and both individual and CPO separately on each outcome specified in the theoretical framework of this study. Lastly, PROCESS macro Model 87 was used to test the serial mediation moderation interactions. This involved testing; consumer technology appropriation (predictor) and authentic pride and IPO (mediators), hubristic pride (moderator) and each outcome (activated product related identity, word-of-mouth and product satisfaction). Similarly, environmental concern (predictor) and moral pride, IPO and CPO (mediators), hubristic pride and collective pride (moderators) and each outcome (activated product related identity, word-of-mouth and product satisfaction).

Finally, for all the mediation and moderation analyses conducted, the confidence level was generated at 95% such that if a zero was not present between the lower and upper confidence intervals, the model suggests that an indirect effect is taking place, that is, presence of a mediator or moderator (Hayes 2018). Moreover, the bootstrapping method using 5000 samples was used throughout, which relates to the process of resampling the data (Hayes 2018).

This section proceeds by presenting the results obtained from running Model 4 before continuing to present the results from Model 6 and 87 respectively. In all cases, a summary of the model is described before presenting the results.

6.5.4.1 Mediating Role of Authentic and Moral Pride

In a mediation model path, (a) denotes the direct effect of the independent variable (IV) on a mediator. Path (b) represents the mediator's direct effect on the dependent variable (DV) with the presence of an independent variable. Path (c') corresponds to the direct effect of the IV on the DV. According to Hayes (2018) for a mediation effect to be taking place, the IV effect on the

DV should be statistically significant when the mediator is controlled. Figure 16 shows a standard mediation model.

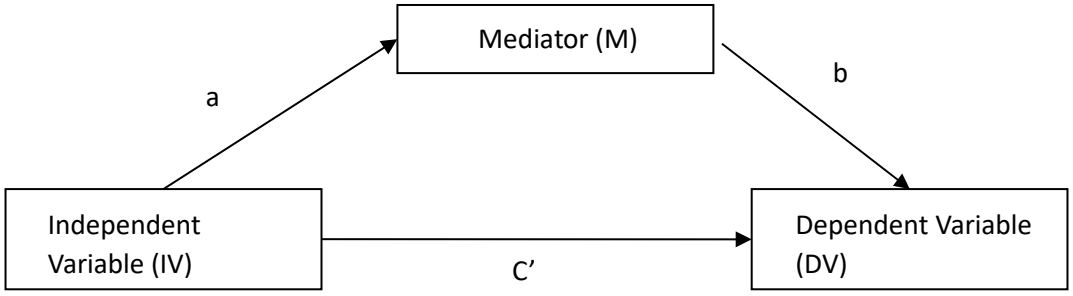


Figure 16 Standard Mediation Model 4

Table 6.39 presents the mediation model results for the mediating effect of authentic pride on consumer technology appropriation and IPO including the 4 control variables specified earlier.

Table 6.9 Model Coefficients for Authentic Pride and IPO

Predictor	**Outcome: Authentic Pride**		**Outcome: IPO**	
	B Coeff	SE	B Coeff	SE
Gender	-0.039	0.124	0.053	0.131
Ownership Type	-0.013	0.010	0.025*	0.010
Car Brand	-0.031	0.046	0.023	0.049
Length of Ownership	0.028	0.052	0.049	0.055
Consumer Technology Appropriation	0.460**	0.068	0.562**	0.081
Authentic Pride	-	-	0.241*	0.056
Model Summary	R^2= 0.345		R^2= 0.467	
n= 426 * p<0.05, ** p<0.01 at 95% interval.				

Mediating Role of Authentic Pride

The results revealed that feeling of control over the technology features of the BEV namely (plug in charge system and interacting with the car through the smartphone application) had a significant direct impact on IPO (b=0.562, p<0.01), and further a significant direct impact on authentic pride (b=0.460, p<0.01). Moreover, authentic pride was shown to have a direct significant impact on IPO (b=0.241, p<0.05). Also, none of the control variables included were statistically significant and impacted the outcome variables.

Figure 17 illustrates this relationship:

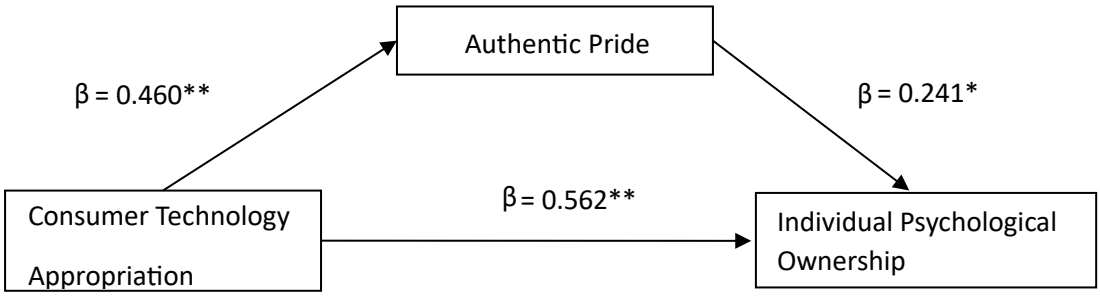


Figure 17 Mediation Path Analysis: CTA - IPO (med) - AP

The mediation summary presented in table 6.10 below shows the total, direct and indirect effects. The results revealed a significant indirect impact of consumer technology appropriation on IPO through authentic pride (b=0.109, p<0.01). Furthermore, the direct effect of consumer technology appropriation on IPO in the presence of authentic pride was found to be significant (b=0.562, p<0.01). Finally, because the Boot LLCI (0.069) and Boot ULCI (0.156) of the indirect effect does not pass through zero, the model supports hypothesis H2A that, authentic pride partially mediates the relationship between consumer technology appropriation and IPO, confirming the proposition made by Kirk et al. (2015).

Table 6.10 Mediation Summary – Authentic Pride							
Relationship	**Total Effect (B)**	**Direct Effect (B)**	**Indirect Effect (B)**	**Confidence Interval (indirect effect)**		**Conclusion**	**Hypothesis**
				BootLLCI	**BootULCI**		
Consumer Technology Appropriation ➔ Authentic Pride ➔ IPO	0.671**	0.562**	0.109**	0.069	0.156	Partial Mediation	H2A Supported
Note: B: Standardised Coefficient, LLCI lower level of the 95% confidence interval, UCLI upper level of the 95% confidence interval, *p<0.05, ** p<0.01							

Mediating Role of Moral Pride between Environmental Concern and IPO

Table 6.11 Model Coefficients for Moral Pride and IPO				
Predictor	**Outcome: Moral Pride**		**Outcome: IPO**	
	B Coeff	SE	B Coeff	SE
Gender	-0.030	0.130	0.053	0.128
Ownership Type	0.07	0.010	0.025*	0.010
Car Brand	0.059	0.048	0.023	0.048
Length of Ownership	0.088	0.054	0.049	0.053
Environmental Concern	0.414**	0.067	0.492**	0.070
Moral Pride	-	-	0.19	0.053
Model Summary	R^2= 0.399		R^2= 0.456	

The results revealed feelings of environmental concern directly impacts IPO over their BEV (b = 0.492 p<0.01) and further show a significant directly impacted moral pride (b=0.414, p<0.01). Moreover, moral pride had a significant direct impact on IPO over the BEV (b=0.19, p<0.05). Finally, none of the control variables included were statistically significant and hence did not impact the outcome variables. Figure 18 illustrates this relationship:

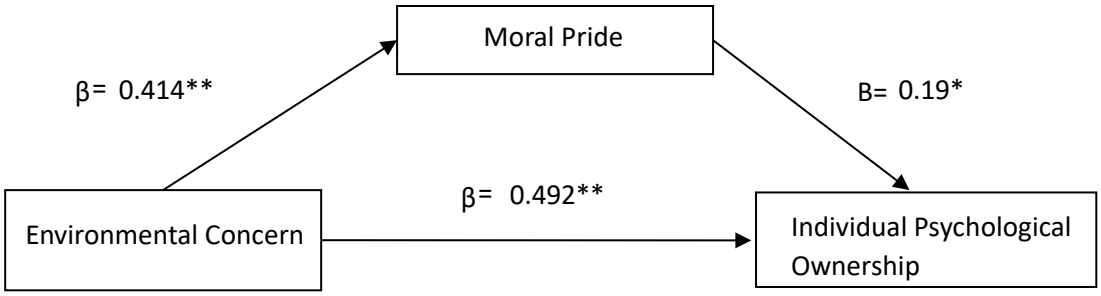


Figure 18 Mediation Path Analysis: Environmental Concern - IPO (med) - MP

The mediation summary presented in table 6.12 shows the total, direct and indirect effects. The results revealed a significant indirect effect of environmental concern on IPO through moral pride (b=0.091, p<0.05). Moreover, the direct effect of environmental concern on IPO in the presence of moral pride was also found to be significant (b=0.492, p<0.01). When observing confidence intervals for the indirect effect (moral pride) on IPO, the lower and upper-level values do not pass through zero (LLCI= 0.120, ULCI= 0.479), indicating that the results are statistically significant. Therefore, concluding moral pride does mediate the relationship between environmental concern and IPO thus supporting H4A.

Table 6.12 Mediation Summary – Moral Pride (IPO)

Relationship	**Total Effect (B)**	**Direct Effect (B)**	**Indirect Effect (B)**	**Confidence Interval**		**Conclusion**	**Hypothesis**
				BootLLCI	BootULCI		
Environmental Concern ➔ Moral Pride ➔ IPO	0.583	0.492	0.091	0.120	0.479	Partial Mediation	H4A Supported

Mediating Role of Moral Pride between Environmental Concern and CPO

Table 6.13 Model Coefficients for Moral Pride and CPO				
Predictor	**Outcome: Moral Pride**		**Outcome: CPO**	
	B Coeff	SE	B Coeff	SE
Gender	-0.030	0.130	-0.092	0.120
Ownership Type	0.07	0.010	0.083	0.010
Car Brand	0.059	0.048	0.084	0.045
Length of Ownership	0.088	0.054	0.014	0.050
Environmental Concern	0.414**	0.049	0.463**	0.065
Moral Pride	-	-	0.334	0.067
Model Summary	R^2= 0.399		R^2= 0.473	
n= 426 * p<0.05, ** p<0.01 at 95% interval.				

The results revealed feelings of environmental concern had a positive impact on feelings of CPO over the BEV owner's community (b = 0.463, p<0.01). Moreover, a direct positive relationship between environmental concern and moral pride is present and statistically significant (b=0.414, p<0.01). Additionally, moral pride was found to be significant for CPO (b=0.334, p<0.01). Finally, none of the control variables included were statistically significant and impacted the outcome variables. Figure 19 illustrates this relationship:

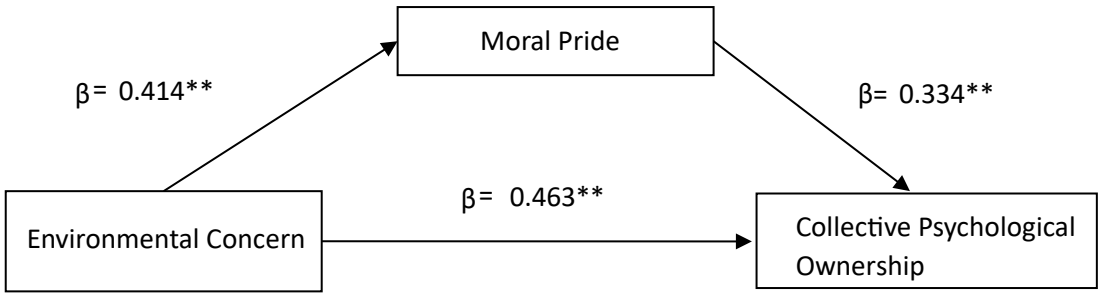


Figure 19 Mediation Path Analysis: EC - CPO (med) - MP

The mediation results presented 6.14 below shows the total, direct and indirect effects. The results reveal a significant indirect impact of environmental concern on CPO through moral

pride (b=0.138, t=13.066) and an upper and lower bound confidence interval between 0.182 and 0.467 hence does not pass through zero and supports H4B. Furthermore, the direct effect of environmental concern on CPO in the presence of moral pride was found also to be significant (b=0.463, p<0.01). In conclusion, moral pride mediates the relationship between environmental concern and CPO and supports hypothesis H4B.

Table 6.14 Mediation Summary - Moral Pride (CPO)

Relationship	Total Effect (B)	Direct Effect (B)	Indirect Effect (B)	Confidence Interval		Conclusion	Hypothesis
				BootLLCI	BootULCI		
Environmental Concern ➔ Moral pride ➔ CPO	0.601	0.463	0.138	0.182	0.467	Partial Mediation	H4B Supported

6.5.4.2 Indirect effects for Serial Mediation Models

Serial Mediation – Authentic Pride and IPO as Mediators.

Building on the single mediation analysis conducted, the next step was to introduce IPO as a second mediator to understand whether any effect between the antecedents to IPO and CPO had any effect on each of the three outcomes and whether these effects were partially serial mediated. To achieve this, Model 6 in PROCESS macro was used. In a serial mediation model, path (a1) denotes the direct effect of the independent variable (IV) on mediator 1. Whilst a2 denotes the direct effect of the (IV) on mediator 2. Path (b1) represents the direct effect of mediator 1 on the dependent variable (DV) with the presence of an independent variable. Path (b2) represents the direct effect of mediator 2 on the DV. Path (c') corresponds to the direct effect of the IV on the DV. Finally, path (d) denotes the direction relationship between M1 and M2. According to Hayes (2018), for a mediation effect to be taking place, the IV effect on the DV should be statistically significant when the mediator is controlled. Figure 20 illustrates a standard serial mediation model.

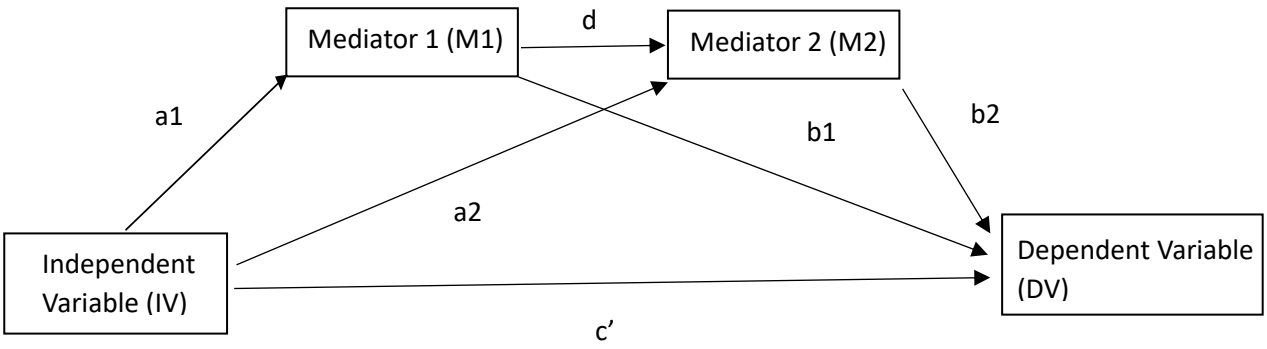


Figure 20 Standard Serial Model 6 (2 mediators)

For the first analysis, the IV is consumer technology appropriation, the two mediators are authentic pride and IPO respectively and DV was; activated product related identity, word-of-mouth and product satisfaction. Table 6.15 summaries the direct effects before presenting the indirect effects in table 6.16.

Table 6.15 Direct Effects between Consumer Technology Appropriation, Authentic Pride and Individual Collective PO on each Respective Outcome

Independent Variable	**Model 1: Authentic Pride**	**Model 2: IPO**	**Model 3: Activated Product Related Identity**	**Model 4: Word-of-Mouth**	**Model 5: Product Satisfaction**
Consumer Technology Appropriation	0.460** (6.884)	0.562** (6.932)	0.269** (3.869)	0.173** (2.593)	0.188*
Authentic Pride	-	0.241* (2.531)	0.214** (4.533)	0.105 * (2.324)	0.122**
IPO	-	-	0.445* (10.113)	0.512** (3.995)	0.399**
Model summary R^2	0.218	0.352	0.417	0.382	0.429
n= 426; t values in bracket. Regression coefficients are standardised, *p<0.05, ** p<0.01					

The results show both consumer technology appropriation and authentic pride both have direct significant effects on each of the outcomes namely; activated product related identity (b=0.269 p<0.01 for consumer technology appropriation and b=0.214 p<0.01 for authentic pride), word of mouth (b=0.173, p<0.01 for consumer technology appropriation and b=0.105, p<0.05 for

authentic pride) and product satisfaction (b=0.188, p<0.05 for consumer technology appropriation and b=0.122, p<0.01 for authentic pride. From these results, it suggests that feeling in control when interacting with technology and further feeling a sense of achievement and success can lead to individuals activating an identity related to the product, spreading positive word of mouth and feeling satisfied with the product with necessarily needing to have feelings of IPO. Additionally, the results for IPO as the predictor reconfirm the results obtained from the regression analysis again supporting H5A, H6A and H7A. Figure's 21, 22 and 23 show the model results for each of these findings:

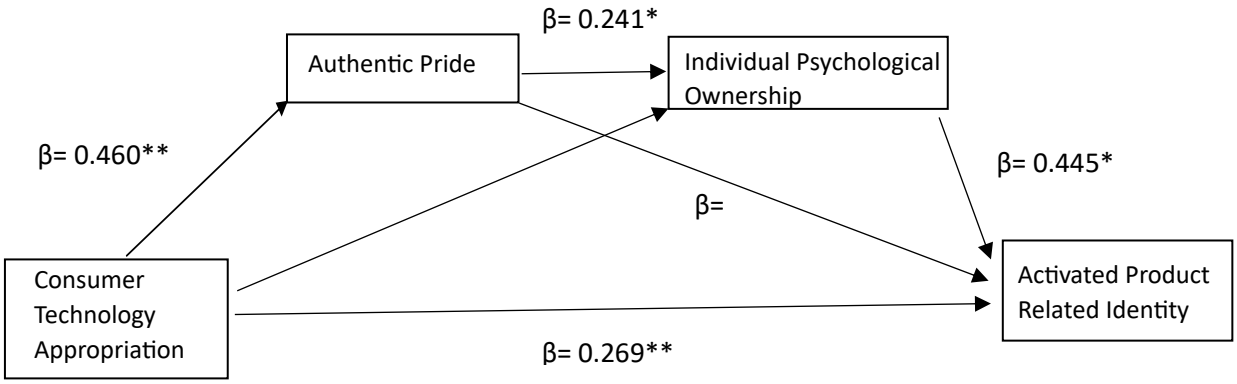


Figure 21 Serial Mediation – Authentic Pride and IPO on Activated Product Related Identity

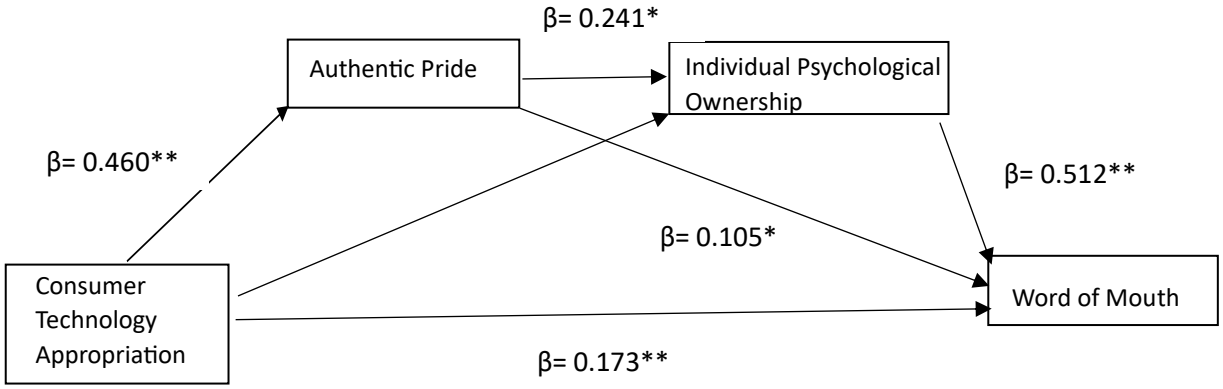


Figure 22 Serial Mediation – Authentic Pride and IPO on Word of Mouth

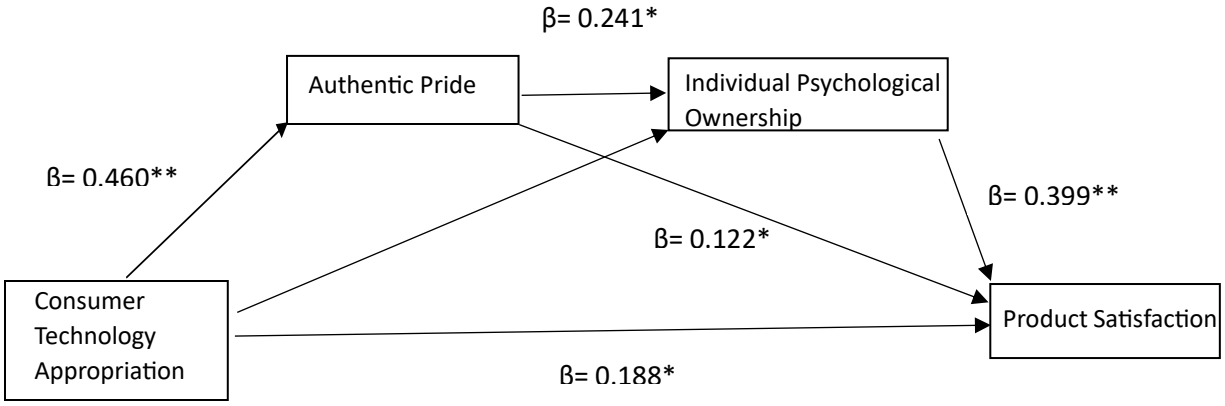


Figure 23 Serial Mediation – Authentic Pride and IPO on Product Satisfaction

To understand the role of authentic pride and IPO as mediators, table 6.16 presents the direct and indirect effects:

Table 6.16 Mediating Effects of Authentic Pride and IPO on each Respective Outcome

Indirect Effects	Effect	LLCI	UPCI
Activated Product Related Identity			
CTA→AP→APRI	0.098	0.234	0.438
CTA→IPO→APRI	0.151	0.08	0.18
CTA→AP→IPO→APRI	0.052	0.09	0.21
Word-of-Mouth			
CTA→AP→WOM	0.091	0.05	0.14
CTA→IPO→WOM	0.05	0.10	0.119
CTA→AP→IPO→WOM	0.061	0.08	0.18
Product Satisfaction			
CTA→AP→PS	0.06	0.061	0.105
CTA→IPO→PS	0.224	0.011	0.099
CTA→AP→IPO→PS	0.045	0.05	0.20
n= 426; LLCI = lower level of the 95% confidence interval, UCLI = upper level of the 95% confidence interval			

Table 6.16 shows, both authentic pride and IPO are each mediators between consumer technology appropriation and each of the three outcomes*;* activated product related identity, word-of-mouth and product satisfaction as all the LLCI and ULCI values do not pass through zero thus signifying a mediating effect is taking place. In the case of activated product related identity as the outcome, the results show the indirect effect of *consumer technology appropriation → authentic pride → IPO → activated product related identity* (b = 0.052, LLCI = 0.09 and ULCI = 0.21) is significant. This was also the case when word-of-mouth and product satisfaction were outcome variables. The results show the indirect effect of *consumer technology appropriation → authentic pride → IPO → word-of-mouth* (b = 0.061, LLCI = 0.08, and ULCI = 0.18) is significant. Similarly, the indirect effect of *consumer technology appropriation → authentic pride → IPO → product satisfaction* (b = 0.045, LLCI = 0.05 and ULCI = 0.20) was also significant. The implications of these findings are discussed in forthcoming chapter 7 when discussing the study's findings.

Serial Mediation – moral pride, IPO, CPO as mediators.

Building on the serial mediation model conducted earlier, this section tests the serial mediation with 3 mediators (moral pride, IPO and CPO) between environmental concern and each of the three outcomes. In this model, the same paths shown in the 2 mediator serial mediation are present however, there are three additional paths as shown in figure 24 below. Path (d2) denotes the direct relationship between M2 and M3, while, path (a3) represents the relationship between IV and M3. Finally, (b3) denotes the path from M3 to DV. It is important to note, the theoretical model in this study does not specify an interaction between IPO and CPO i.e M2 to M3 however the interaction was noted in the results table.

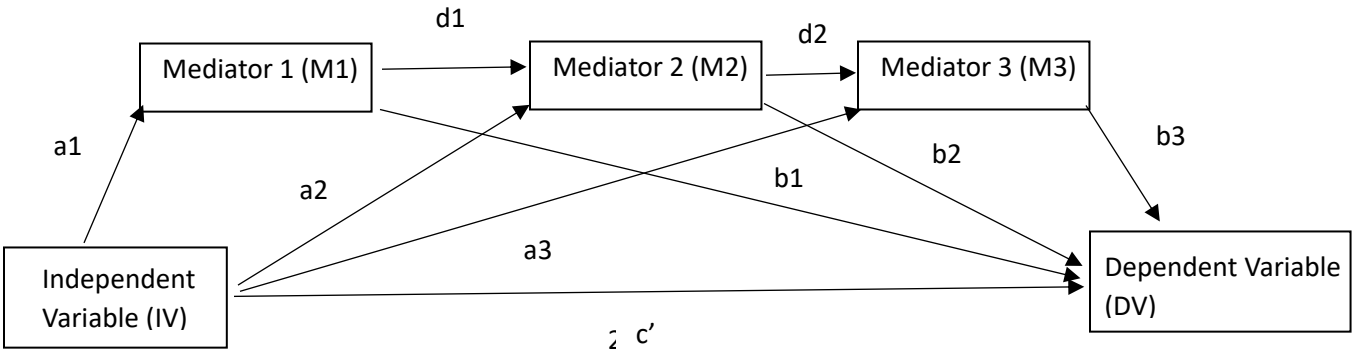


Figure 24 Standard Serial Model 6 (3 mediators)

Table 6.17 Direct Effects between Environmental Concern, Moral Pride and Individual Collective PO on each Respective Outcome						
Independent Variable	Model 1: Moral Pride	Model 2: IPO	Model 3: CPO	Model 4: Activated Product Related Identity	Model 5: Word-of-Mouth	Model 6: Product Satisfaction
Environmental Concern	0.414** (6.490)	0.492** (7.082)	0.463** (5.867)	0.134* (4.209)	0.184** (2.871)	0.151 (n.s)
Moral Pride	-	0.198 (3.167)	0.334** (4.075)	0.327* (7.373)	0.058 (n.s)	0.070 (n.s)
IPO	-		0.118* (2.308)	0.421* (2.512)	0.489** (3.765)	0.381** (8.365)
CPO	-	-	-	0.262 (n.s)	0.324* (2.421)	0.421** (6.122)
R^2	0.204	0.183	0.199	0.352	0.298	0.130
n= 426; t values in bracket. LLCI = lower level of the 95% confidence interval, UCLI = upper level of the 95% confidence interval *p<0.05, ** p<0.01						

The results indicate, while environmental concern has a direct significant effect on activated product related identity (b=0.134, p<0.05) and word-of-mouth (b=0.184, p<0.01) this is not the case when the outcome is product satisfaction (b=1.51 p>0.05). Moreover, moral pride seems to have a direct effect on activated product related identity (=0.327 p<0.05) but not on word-of-mouth (b=0.058 p>0.05) and product satisfaction (b=0.070, p<0.05). These results suggests that concern about the environment may shape the extent to that an individual may derive an identity from a product presumably one which reflects being environmentally responsible. Additionally, the results for IPO and CPO as the predictors reconfirm the results obtained from the regression analysis again supporting H5A but not H5B, supporting H6A and H6B and supporting H7A and H7B.

Table 6.18 Mediating Effects of Moral Pride, Individual and Collective PO on Each Respective Outcome			
Indirect Effects	**Effect**	**LLCI**	**UPCI**
Activated Product Related Identity			
EC→MP→IPO→APRI	0.08	0.031	0.054
EC→MP→CPO→APRI	0.019	- 0.04	0.084
EC→IPO→CPO→APRI	0.055	-0.06	0.028
EC→MP→IPO→CPO→APRI	0.04	- 0.02	0.06
Word-of-Mouth			
EC→MP→IPO→WOM	0.05	0.06	0.11
EC→MP→CPO→WOM	0.09	0.11	0.21
EC→IPO→CPO→WOM	0.12	0.06	0.12
EC→MP→IPO→CPO→WOM	0.08	0.08	0.152
Product Satisfaction			
EC→MP→IPO→PS	0.06	0.07	0.134
EC→MP→CPO→PS	0.05	0.06	0.119
EC→IPO→CPO→PS	0.08	0.10	0.19
EC→MP→IPO→CPO→PS	0.04	0.03	0.09
n= 426; LLCI = lower level of the 95% confidence interval, UCLI = upper level of the 95% confidence interval			

When activated product related identity is the outcome, the results show the path of *environmental concern → moral pride → IPO → activated product related identity* is significant as the LLCI and ULCI values do not pass through zero (b=0.08, LLCI = 0.031 and ULCI = 0.054) indicating serial mediation takes place. However, when the same path includes CPO as an additional mediator taking place after IPO: *environmental concern → moral pride → IPO → CPO → activated product related identity,* the result shows a non-significant result as the LLCI and

ULCI values pass through zero (b=0.04, LLCI = -0.02 and ULCI = 0.06). This indicates while moral pride and IPO mediate the relationship between environmental concern and activated product related identity this does not apply when CPO is an additional mediator in the series. This finding reflects the results obtained in 6.5.3 when testing H4A, H4B, H5A and H5B.

In the case of word-of-mouth as the outcome, again moral pride and IPO had a mediating effect between environmental concern and word-of-mouth (b=0.05, LLCI = 0.06 and ULCI = 0.11) indicating a serial mediation path. Further, when CPO is added as an additional mediator the results show a significant serial mediation taking place between *environmental concern → moral pride → IPO → CPO → word-of-mouth* (b=0.08, LLCI=0.08, ULCI 0.152). This result implies that when individuals act on their environmental concern such as owning a BEV, they trigger feelings of moral pride which instigates feelings of IPO towards the car and thus drive feelings of CPO towards the BEV community. As a result, this leads to word-of-mouth communication.

Finally, for product satisfaction, moral pride and IPO act as serial mediators between environmental concern and product satisfaction, *environmental concern → moral pride → IPO → product satisfaction* (b=0.06, LLCI = 0.07 and ULCI = 0.134). Moreover, in the presence of CPO as an additional mediator sequencing IPO, the results suggest a significant 3 series serial mediation i.e. *environmental concern → moral pride → IPO → CPO → product satisfaction* (b=0.04, LLCI =0.03, ULCI = 0.09). In a similar fashion to word-of-mouth, this suggests environmental concern only leads to feelings of moral pride and feelings of ownership as previously confirmed, but can also lead to product satisfaction when feelings of moral pride and PO (both IPO and CPO) are serial mediators. The implications of these findings are discussed later in chapter 7 when discussing the findings of the study.

The next section presents the findings when hubristic pride and collective pride are introduced as moderators to understand the impact this may have on each of the three outcomes in the theoretical model.

6.5.5 Indirect effects for Full Moderation Serial Mediation Models – Hubristic Pride

Following the serial mediation analysis, the following step was to test the moderating effect of hubristic and collective pride between IPO and CPO and each of the three outcomes. To achieve this, Model 87 from PROCESS macro was used. To test the interaction effect of hubristic pride, the standard Model 87 was used as shown in figure 25. The paths are similar to that seen in Model 6 however a moderating interaction denoted by W is present between M2 and DV shown by path (e):

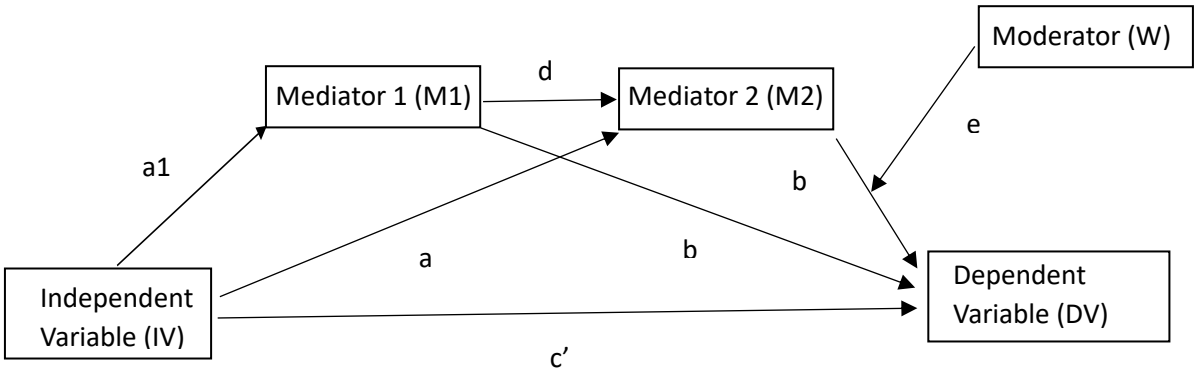


Figure 25 Standard Serial Mediation Moderation Model 87

As for the moderating effects of both collective pride and hubristic pride in the same model, a modified version of Model 87 was used where an additional mediator (M3) and second moderator (Z) was included. This pathway is detailed further into this section after presenting the findings on hubristic pride as a sole moderator to verify hypothesis H8A, H8B and H8C.

Moderating effect of Hubristic Pride:

Table 6.19 Moderated Mediation Regression Results When Hubristic Pride is the Moderator

	Model 1 Authentic Pride				**Model 2 Individual Psychological Ownership**				**Model 3 Activated Product Related Identity**				**Model 4 Word-of-Mouth**				**Model 5 Product Satisfaction**			
	B	SE	CLs		B	SE	CLs		B	SE	CLs		B	SE	CLs		B	SE	CLs	
			LLCI	*ULCI*			*LLCI*	*ULCI*			*LLCI*	*ULCI*			LLCI	ULCI			LLCI	ULCI
Gender	0.04	0.07	-0.29	0.21	-0.05	0.13	-0.30	0.21	0.08	0.11	-0.14	0.29	0.09*	0.045	0.03	0.14	0.11	0.08	-0.06	0.27
Ownership Type	0.28	0.05	-0.08	0.13	-0.08	0.05	-0.01	0.10	0.02	0.05	-0.07	0.11	0.04	0.05	-0.08	0.09	-0.02	0.04	-0.88	0.03
Car Brand	0.01	0.01	-0.03	0.01	0.06	0.01	-0.01	0.03	0.01	0.01	-0.01	0.03	0.08*	0.03	0.06	0.09	0.06*	0.07	0.05	0.11
Length of Ownership	-0.03	0.04	-0.12	0.06	-0.07	0.05	-0.16	0.02	-0.03	0.04	-0.11	0.05	0.01	0.06	-0.03	0.04	0.07	0.03	-0.12	0.11
Consumer Technology Appropriation	0.42**	0.07	0.53	0.81	0.44	0.07	0.25	0.55	0.27**	0.07	0.13	0.40	0.18*	0.68	0.04	0.30	0.19*	0.06	0.07	0.16
Authentic Pride	-	-	-	-	0.29*	0.06	0.02	0.19	0.10*	0.09	0.40	0.59	0.09*	0.046	0.09	0.182	0.13	0.06	0.09	0.16
IPO	-	-	-	-	-	-	-	-	0.49**	0.05	0.08	0.28	0.53*	0.08	0.26	0.35	0.40**	0.08	0.12	0.32
Hubristic Pride (HP)	-	-	-	-	-	-	-	-	0.18*	0.167	0.27	0.41	0.25**	0.03	0.03	0.13	0.21	0.12	-0.46	0.04
IPO x HP	-	-	-	-	-	-	-	-	0.09**	0.03	0.07	0.19	0.13**	0.03	0.09	0.18	0.07	0.02	-0.02	0.09
Model Summary	R^2 = 0.35 F(5, 351) = 19.53**				R^2 = 0.47 F(6, 350) = 22.26**				R^2 = 0.42 F(9, 347) = 27.82**				R^2 = 0.35 F(9, 347) = 24.61**				R^2 = 0.39 F(9, 347) = 20.52**			
ΔR^2 due to IPO × HP									ΔR^2 0.04, F(1, 347) = 3.82**				ΔR^2 0.05 F(1, 347) = 2.58**				ΔR^2 0.04, F(1, 347) = 3.67**			

Moderator	Conditional Indirect Effects of IPO on Activated Product Related Identity				Conditional Indirect Effects of IPO on Word-of-Mouth				Conditional Indirect Effects of IPO on Product Satisfaction			
	B	SE	CLs		B	SE	CLs		B	SE	CLs	
			LLCI	ULCI			LLCI	ULCI			LLCI	ULCI
Low levels of Hubristic Pride (mean - 1)	0.06	0.05	0.05	0.18	0.11	0.06	0.04	0.11	(n .s)	(n .s)	(n .s)	
Average levels of Hubristic Pride (mean)	0.15	0.07	0.07	0.26	0.21	0.04	0.07	0.18				
High levels of Hubristic Pride (mean +1)	0.24	0.09	0.09	0.32	0.31	0.05	0.08	0.29				

N= 426, CI = confidence interval. LLCI lower level of the 95% confidence interval, UCLI upper level of the 95% confidence interval, *p < 0.05; **p < 0.01;

As shown in table 6.19, the moderating role of hubristic pride has a positive impact between IPO and activated product related identity as the interaction effect is statistically significant (b=0.09, LLCI = 0.07 and ULCI = 0.19). Moreover, the results echo the earlier findings that there is a positive significant relationship between IPO and activated product related identity (b=0.49, LLCI = 0.08 and ULCI = 0.28). Overall, the results support H8A, as the effect of IPO on activated product related identity was shown to be moderated by feelings of hubristic pride. To enrich the interpretation of the results, hubristic pride was zero-centred at 1 standard deviation above its mean (i.e., indicating "High" feelings) and at 1 standard deviation below its mean (i.e., indicating "Low" feelings) prior to model estimation. Examination of these interactions shows when hubristic pride is "high" (+ 1 SD) the effect is strong (b= 0.24, LLCI = 0.09 and ULCI = 0.32) and when hubristic pride is "low" (- 1 SD) the effect is weak (b=0.06, LLCI = 0.05 and ULCI = 0.18). This result further provides support theorising that the effect of IPO on activated product related identity is strengthened as feelings of hubristic pride increase, thus supporting H8A. Figure 26 illustrates this using slope analysis:

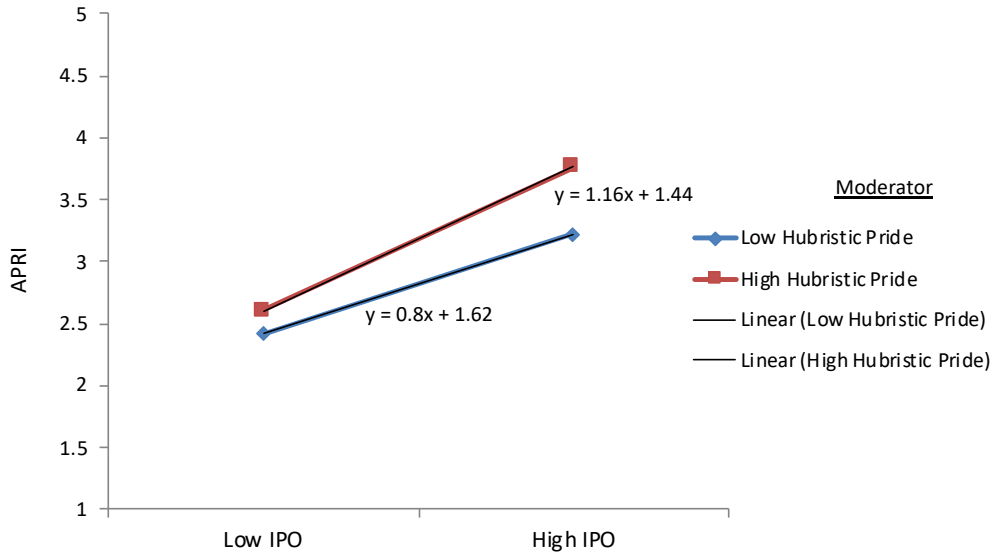


Figure 26 Moderating effect of Hubristic Pride on Activated Product Related Identity

Figure 26 shows a positive relationship between IPO and activated product related identity at high levels of hubristic pride. Moreover, as feelings of IPO increase from 'low' to 'high', the relationship between IPO and activated product related identity becomes stronger (slope of the curve is upward rising and becoming steeper) than when hubristic pride was 'low'. Thus, these results corroborate the hypothesise H8A.

The results provide strong support for the theorisation of H8B in that hubristic pride has a positive moderating impact between IPO and word-of-mouth (b= 0.13, LLCI = 0.09 and ULCI = 0.18). Additionally, the results revalidate prior analysis that there is a significant positive interaction between IPO and word-of-mouth (b= 0.53, p<0.01, LLCI= 0.26, UPCI= 0.35). Overall, the results support H8B, as the effect of IPO on word-of-mouth is shown to be moderated by feelings of hubristic pride. Moreover, hubristic pride was again zero-centred at 1 standard deviation above its mean to indicate "High" feelings and at 1 standard deviation below its mean to indicate "Low" feelings. Probing these significant interactions shows when hubristic pride is "high" (+ 1 SD) the effect is strong (b=0.31, LLCI= 0.08, UPCI= 0.29) and when hubristic pride is "low" (- 1 SD) the effect is weak (b=0.11, LLCI= 0.04, UPCI= 0.11). This result further provides indicates feelings of hubristic pride strengthen the effect of IPO on word-of-mouth supporting H8B. Figure 27 shows this using slope analysis:

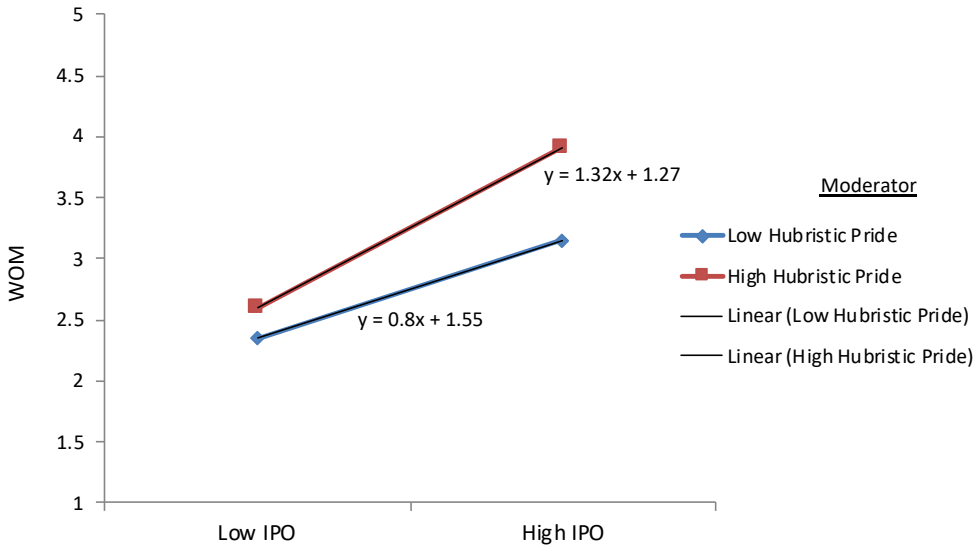


Figure 27 Moderating effect of Hubristic Pride on Word of Mouth

Figure 27 shows the relationship between IPO and word-of-mouth was positive at high levels of hubristic pride. As feelings of IPO increase from 'low' to 'high', the relationship between IPO and word-of-mouth becomes stronger (increasing slope of the curve) than when hubristic pride was 'low'. Thus, these results corroborate the hypothesise H8B.

Finally, the results in table 6.50 indicate hubristic pride as a moderator does not have a significant interaction between IPO and product satisfaction as shown by the interaction effect being statistically non-significant (b=0.07, LLCI= -0.02, UPCI= 0.09). Thus, this finding does not support the hypothesise H8C. The results did however reconfirm prior analysis results that there is a positive relationship between IPO and product satisfaction (b=0.40 $p<0.05$, LLCI= 0.12, UPCI= 0.32). Overall, H8C was not supported since the effect of IPO on product satisfaction was not shown to be moderated by feelings of hubristic pride.

6.5.6 Indirect effects for Full Moderation Serial Mediation Models – Hubristic and Collective Pride

Building on the analysis conducted thus far for testing hubristic pride as a moderator, this section presents the analysis results when testing the moderating effect of collective pride between CPO and each of the three outcomes, as proposed in the framework of this study. To achieve this, a modified version of Model 87 from PROCESS macro was used. Unlike the standard Model 87 used previously, to test the effects of collective pride and the additional mediator of CPO, the standard Model 87 was modified as illustrated below as to measure hypotheses H9A, H9B and H9C. To modify the standard Model 87, the steps to modify a PROCESS macro model as outlined by Hayes (2018 p.613 - 623) were used as a guide. In essence, this involved creating a series of number model matrices and cross coding each independent, dependent, mediator and moderator variables with each of the three outcomes to reflect the proposed conceptual framework. These matrices therefore denote which antecedent variables send effects to the outcome variables, and subsequently which effects are estimated as mediators and moderators. Subsequently, the B matrix represents mediation effects, the W matrix represents the first moderating effect (hubristic pride), and the Z matrix represents the second moderating effect (collective pride). For each matrix coding, the cell in the row is assigned with a 1 if the variable in the column affects the consequent variable. In other words,

there is an effect to be estimated rather than fixed to zero. Accordingly, a 0 is assigned if there is no effect being estimated. In summary, for each proposed dependent variable (activated product related identity, word-of-mouth and product satisfaction) the B, M and Z matrixes were created. The coding outcomes was then grouped to form an equation which was then added to PROCESS macro to run the effects to be estimated. The equation also included the same four control variables in this study. Thus, in total, 3 equations were formed each representing the three outcomes from the conceptual framework of the study. Table 6.20 examples the B matrix coding when adding a third mediator (CPO) to Model 87 and word-of-mouth as the outcome:

Table 6.20 Matrix Coding for Modified Model 87

	IV	M1	M2	M3
M1	1	-	-	-
M2	1	1	-	-
M3	1	1	0	
DV	1	0	1	1
B matrix statement= 1,1,1,1,1,0,1,0,1,1				

Subsequently following coding of the B matrix, W matrix and Z matrix and inclusion of the control variables the following equation was formed:

process y=wom/m=mp ipo cpo/x=ec/w=hp/z=cp/cov=gender bevbrand low owntype/bmatrix=1,1,1,1,1,0,1,0,1,1/wmatrix=0,0,0,0,0,0,1,0,1,0/zmatrix=0,0,0,0,0,0,1,0,0,1/ cmatrix=1,1,1,1,1,1,1,1,1,1,1,1,1,1,1.

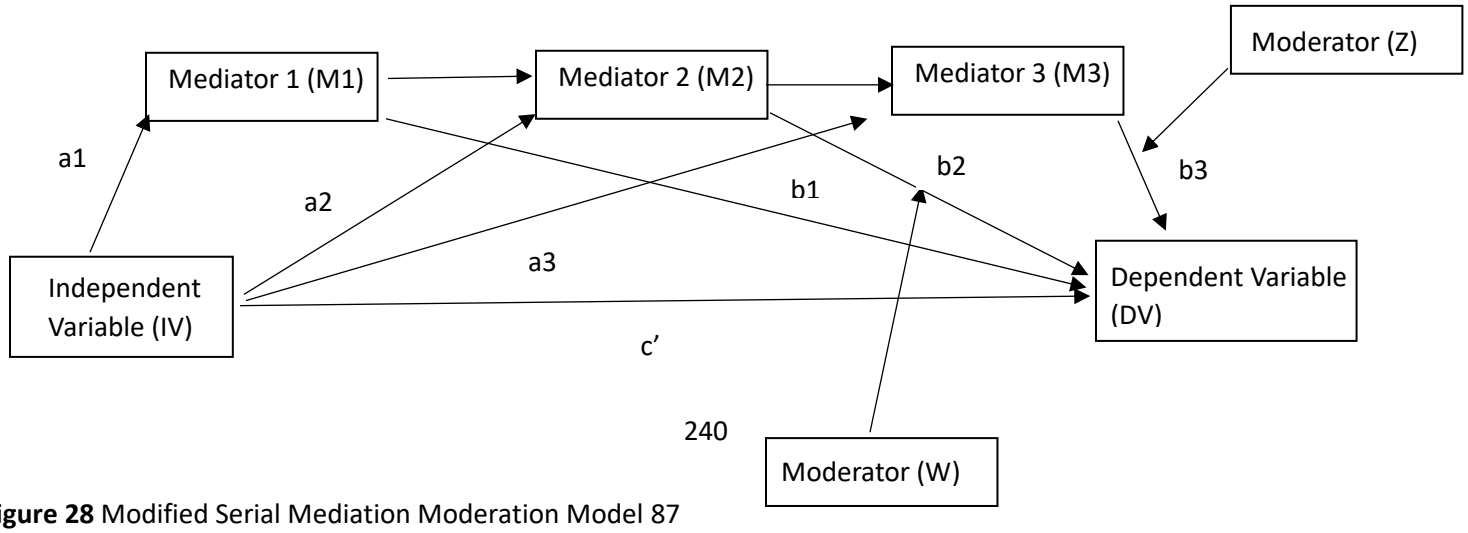


Figure 28 Modified Serial Mediation Moderation Model 87

Table 6.21 Moderated Mediation Regression Results When Hubristic Pride and Collective Pride are the Moderators **(1/2)**																
	Model 1 Moral Pride				**Model 2 Individual Psychological Ownership**				**Model 3 Collective Psychological Ownership**				**Model 4 Activated Product Related Identity**			
	B	SE	CLs		B	SE	CLs		B	SE	CLs		B	SE	CLs	
			LLCI	*ULCI*			*LLCI*	*ULCI*			*LLCI*	*ULCI*			LLCI	ULCI
Gender	0.03	0.13	-0.29	0.22	-0.09	0.13	-0.34	0.15	-0.09	0.11	-0.32	0.14	0.12	0.11	-0.12	0.32
Ownership Type	0.08	0.05	-0.18	0.19	0.04	0.05	-0.06	0.15	0.08	0.05	-0.02	0.18	0.01	0.03	--0.12	0.06
Car Brand	0.06	0.01	-0.03	0.03	0.01	0.01	-0.01	0.03	0.08	0.09	-0.09	0.03	0.05	0.04	-0.01	0.02
Length of Ownership	0.06	0.05	-0.03	0.15	-0.06	0.04	-0.15	0.03	0.01	0.04	-0.89	0.08	0.03	0.04	-0.13	0.03
Environmental Concern	0.43**	0.05	0.31	0.56	0.49**	0.07	0.35	0.62	0.46**	0.062	0.33	0.59	0.13**	0.04	0.08	0.20
Moral Pride	-	-	-	-	0.091	0.05	0.05	0.16	0.332	0.067	0.12	0.31	0.31*	0.04	0.10	0.19
IPO	-	-	-	-	-	-	-	-	-	-	-	-	0.52**	0.14	0.35	0.93
CPO	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.15	-0.07	0.21
Hubristic Pride (HP)	-	-	-	-	-	-	-	-	0.18*	0.167	0.27	0.41	0.07	0.18	0.29	0.39
IPO x HP	-	-	-	-	-	-	-	-	0.09	0.03	0.07	0.19	0.09	0.04	0.07	0.21
Collective Pride (CP)	-	-	-	-	-	-	-	-	-	-	-	-	0.16	0.14	0.22	0.38
CPO x CP	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.03	0.18	0.32

Model Summary	R^2 = 0.212 F(6, 350) = 8.94**	R^2 = 0.16 F(6, 350) =11.56**	R^2 = 0.25 F(6, 350) = 16.93**	R^2 = 0.38 F(10, 346) = 30.58**
ΔR^2 due to IPO × HP				ΔR^2 0.04 F(1, 346) = 15.59**
ΔR^2 due to CPO × CP				ΔR^2 0.01 F(1, 346) = 1..64**

Table 6.21 Moderated Mediation Regression Results When Hubristic Pride and Collective Pride are Both Moderators **(2/2)**

	Model 5 Word-of-Mouth				**Model 6 Product Satisfaction**			
	B	SE	CLs		B	SE	CLs	
			LLCI	*ULCI*			*LLCI*	*ULCI*
Gender	0.08*	0.04	0.03	0.14	0.11	0.08	-0.07	0.28
Ownership Type	0.05	0.05	- 0.08	0.09	-0.02	0.04	-0.82	0.07
Car Brand	0.08*	0.03	0.06	0.09	0.06	0.07	0.05	0.11
Length of Ownership	0.01	0.04	- 0.07	0.09	0.05	0.03	-0.12	0.12
Environmental Concern	0.19*	0.05	0.14	0.21	0.16	0.08	0.13	0.20
Moral Pride	0.06	0.06	- 0.15	0.13	0.07	0.06	0.02	0.07
IPO	0.50**	0.09	0.21	0.35	0.39**	0.04	0.07	0.23
CPO	0.34**	0.13	0.19	0.33	0.41**	0.04	0.13	0.34
Hubristic Pride (HP)	0.18*	0.17	0.28	0.42	0.22	0.024	-0.02	0.09
IPO x HP	0.18	0.04	0.07	0.25	0.09	0.026	0.01	0.11
Collective Pride (CP)	0.29	0.14	0.02	0.35	0.39	0.11	0.12	0.48
CPO x CP	0.12	0.03	0.11	0.27	0.16	0.03	0.10	0.34
Model Summary	R^2 = 0.25 F(10, 346) = 8.04**				R^2 = 0.17 F(6, 350) = 6.264**			
ΔR^2 due to IPO × HP	ΔR^2 0.05 F(1, 346) = 2.67**				ΔR^2 0.04, F(1, 346) = 3.67**			
ΔR^2 due to CPO × CP	ΔR^2 0.08 F(1, 346) = 3.22**				ΔR^2 0.09, F(1, 346) = 3.67**			

Moderator	**Conditional Indirect Effects of IPO on Activated Product Related Identity**				**Conditional Indirect Effects of IPO on Word-of-Mouth**				**Conditional Indirect Effects of IPO on Product Satisfaction**			
	B	SE	CLs		B	SE	CLs		B	SE	CLs	
			LLCI	ULCI			LLCI	ULCI			LLCI	ULCI
Low levels of Collective Pride (mean - 1)	0.08	0.03	0.01	0.14	0.16	0.03	0.1	0.22	0.10	0.05	0.09	0.18
Average levels of Collective Pride (mean)	0.15	0.02	0.04	0.19	0.25	0.04	0.17	0.28	0.18	0.07	0.16	0.29
High levels of Collective Pride (mean +1)	0.22	0.03	0.11	0.30	0.34	0.05	0.21	0.46	0.26	0.11	0.21	0.47

N= 426, CI = confidence interval. LLCI lower level of the 95% confidence interval, UCLI upper level of the 95% confidence interval, *p < 0.05; **p < 0.01;

As shown in table 6.21, the moderating role of collective pride shows a positive impact between CPO and activated product related identity as the interaction effect is statistically significant (b=0.11, LLCI = 0.18 and ULCI = 0.32). Moreover, when including the control variables in the model, the results showed that these variables have a non-significant relationship activated product related identity. This result however challenges the finding attained earlier during the regression analysis by suggesting there is a non significant relationship between CPO and activated product related identity (b=0.25, LLCI = -0.07 and ULCI = 0.21). This suggests, the inclusion of collective pride as a moderator strengthens the relationship between CPO and activated product related identity, thereby supporting H9A. Interestingly, when comparing with the interaction effect of hubristic pride between IPO and activated product related identity (b=0.09), it can be said that collective pride has a stronger effect than hubristic pride on activated product related identity. To enrich the interpretation of the results, slope analysis was also applied to collective pride which was zero-centred at 1 standard deviation above its mean (i.e., indicating "High" feelings) and at 1 standard deviation below its mean (i.e., indicating "Low" feelings) prior to model estimation. These interactions show that when collective pride is "high" (+ 1 SD) the effect is strong (b= 0.22, LLCI = 0.11 and ULCI = 0.30) and when collective pride is "low" (- 1 SD) the effect is weak (b=0.08, LLCI = 0.01 and ULCI = 0.14). Consequently, it can be concluded the effect of CPO on activated product related identity is strengthened as feelings of collective pride increase, supporting H9A. Figure 29 illustrates this using slope analysis:

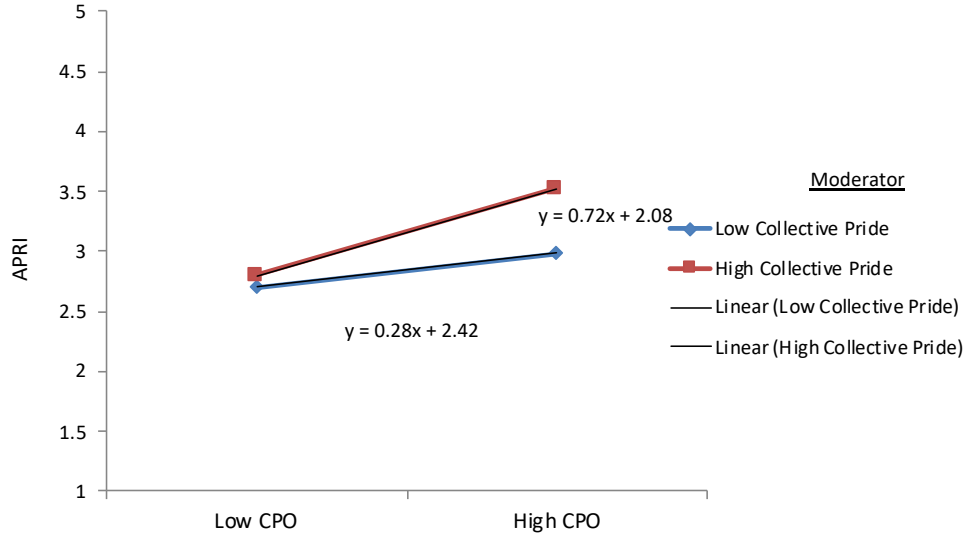


Figure 29 Moderating effect of Collective Pride on Activated Product Related Identity.

As for the outcome of word-of-mouth, the moderating role of collective pride was statistically significant (b=0.12, LLCI = 0.11 and ULCI = 0.27) between CPO and word-of-mouth. This result further confirms prior analysis that CPO positively impacts word-of-mouth (b=0.29, LLCI=0.02, UPCI= 0.35), supporting H7B. Interestingly, when comparing the interaction effect of hubristic pride between IPO and word-of-mouth (b=0.13), the interaction effects a similar to that of collective pride thus, there is not significant difference between them on the outcome of word-of-mouth. To support these results, figure 30 shows the slope analysis indicating when collective pride is "high" (+ 1 SD) the effect is strong (b= 0.34, LLCI = 0.21 and ULCI = 0,46) and when collective pride is "low" (- 1 SD) the effect is weak (b=0.16, LLCI = 0.10 and ULCI = 0.22). This means that BEV owners that share feelings of CPO not only tend to engage in word-of-mouth, but this interaction is strengthened when the individual has high levels of collective pride. Consequently, it can be concluded the effect of CPO on word-of-mouth is strengthened as feelings of collective pride increase supporting H9B.

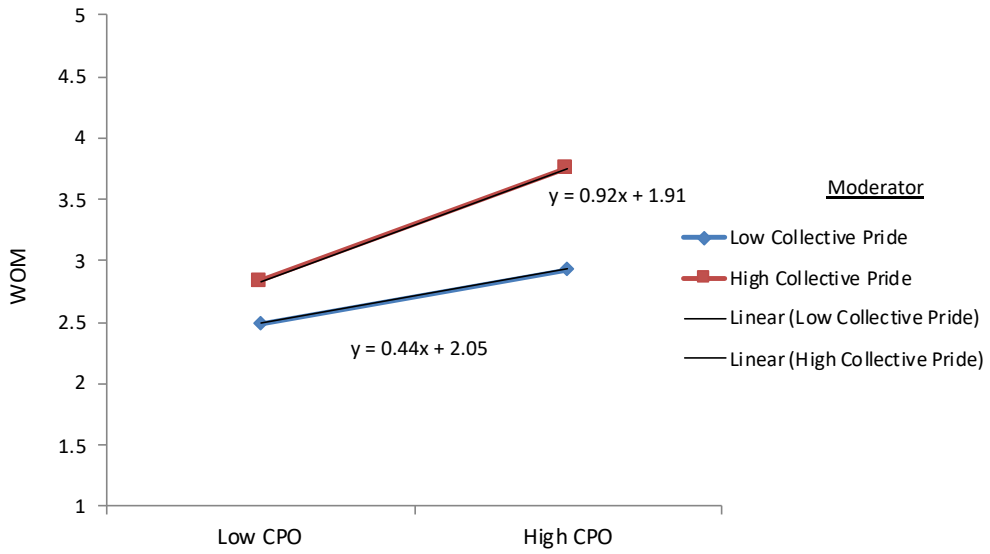


Figure 30 Moderating effect of Collective Pride on Word of Mouth

Finally, the results indicate collective pride has a positive moderating effect between CPO and product satisfaction (b= 0.16, LLCI= 0.10, UPCI= 0.34). Additionally, the results further reconfirm prior analysis that CPO positively impacts product satisfaction (b=0.41, LLCI=0.13, UPCI= 0.34).

Moreover, when comparing the interaction effect of hubristic pride between IPO and product satisfaction (b=0.09), it appears collective pride has a stronger effect than hubristic pride on product satisfaction. To enrich the interpretation of the results, slope analysis was again applied and showed when collective pride is "high" (+ 1 SD) the effect is strong (b= 0.26, LLCI = 0.21 and ULCI = 0.47) and when collective pride is "low" (- 1 SD) the effect is weak (b=0.10, LLCI = 0.09 and ULCI = 0.18). Thus, suggesting BEV owners that share feelings of CPO not only tend to feel more satisfied by owning a BEV, but this interaction is strengthened when the individual has high levels of collective pride. Accordingly, it can be concluded the effect of CPO on product satisfaction is strengthened as feelings of collective pride increase supporting H9C. Figure 31 shows this:

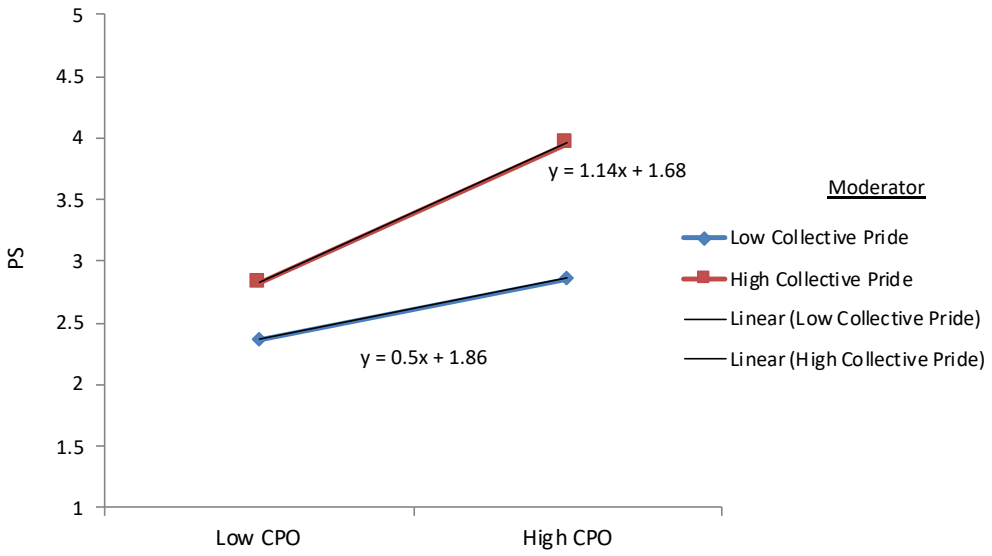


Figure 31 Moderating effect of Collective Pride on Product Satisfaction

6.6 Testing the Impact of Gender, Age, Type of Ownership, Geographic Region and Car Brand Variables

For this stage of the analysis, the data was examined to identify any significant differences between groupings of respondents. The first group to be examined was gender (male and female). Second, the impact of age differences was examined before third analysing differences in type of ownership (outright buy, private lease, salary sacrifice lease, company car and car share). Finally, geographic region differences were examined namely; North, Mid and South Wales, to understand if these may explain any difference in the reported results regarding the outcomes of PO as well as the predicators of PO.

The 95% confidence level was applied to the data which follows most studies in consumer behaviour that test for difference in groups. For gender differences, an independent t test was conducted, as this only included 2 groups whereas for the differences in age, type of ownership, geographic region and car brand one way ANOVA was conducted with post-hoc tests (Tukey HSO test) to determine the exact differences if any occur. The results of the analysis is discussed as follows:

6.6.1 Gender Differences

Since the data comprised of only two groups, an independent sample t-test was applied to compare differences in male and female score for all 11 constructs in the study. Table 6.23 below shows there is no significant difference between males and females in all of the variables expect word-of-mouth and hubristic pride as shown by the p-values being < 0.05 (Pallant 2020). For word-of-mouth, males were found to have a higher mean score (M=6.443 SD = 0.753) than females (M= 6.106 SD= 0.936), reinforcing other empirical findings that males are more likely to engage in word-of-mouth communication when owning a BEV (Reddy et al. 2022). Regarding hubristic pride upon inspecting the differences in mean between genders the mean score for males (M= 1.982 SD 1.0571) was higher than females (M= 2.765 SD 1.2847), which is plausible, as prior studies suggest hubristic pride is felt more strongly in males than females (Tracy et al. 2007; Higgins et al. 2012).

Table 6.23 Results of T- test on Gender Differences		
Variable	**T Test**	**Sig. (2 tailed)**
Consumer Technology Appropriation	-1.229	0.220
Environmental Concern	-0.376	0.707
IPO	0.325	0.745
CPO	0.219	0.827
Authentic Pride	0.262	0.793
Moral Pride	-0.182	0.856
Activated Product Related Identity	-0.505	0.614
Word-of-Mouth	1.532	0.026
Product Satisfaction	-0.851	0.395
Hubristic Pride	1.251	0.042
Collective Pride	1.117	0.265

6.6.2 Age Differences

The data revealed there are six age categories indicating this is a continuous variable thus the most suitable statistical test is conducting a one-way ANOVA to determine their significance. If the F test resulted in a P value <0.05, the null hypothesis is rejected. The six age categories are outlined below: 18-21, 22-30, 31-40, 41-50, 51-66, 66+.

Table 6.24 Results of one-way ANOVA Test on Age Differences			
Variable	**F**	**Sig.**	**Null Hypothesis (Accept or Reject)**
Consumer Technology Appropriation	0.473	0.796	Accepted
Environmental Concern	1051	0.418	Accepted
Individual Psychological Ownership	0.927	0.464	Accepted
Collective Psychological Ownership	0.896	0.484	Accepted
Authentic Pride	0.574	0.720	Accepted
Moral Pride	1.905	0.093	Accepted
Activated Product Related Identity	0.740	0.594	Accepted
Word-of-Mouth	1.995	0.079	Accepted
Product Satisfaction	0.365	0.873	Accepted
Hubristic Pride	3.220	0.271	Accepted
Collective Pride	1.087	0.367	Accepted

Table 6.24 shows there is no significant difference between any of the age groups on 11 of the variables examined in the study, as all P values were greater than 0.05 (Pallant 2020). Therefore, can conclude there was no difference in the responses given by any age groups in this dataset.

6.6.3 Geographic Region

Since the context of this study is Wales, which comprises of 3 regions; North Wales, Mid Wales and South Wales, the dataset aimed to capture the responses from BEV owners across all three regions. Based on the descriptive results, 245 out of 426 respondents stated they are from South Wales which is understandable given the number of public chargers in South Wales is much higher than that in North and Mid Wales (878 and 779 respectively). Table 6.25 shows differences in responses based on geographic region with all 11 variables in this study.

Table 6.25 Results of one-way ANOVA test on Geographic Differences

Variable	F	Sig.	Null Hypothesis (Accept or Reject)
Consumer Technology Appropriation	2.549	0.846	Accepted
Environmental Concern	0.764	0.466	Accepted
IPO	0.735	0.582	Accepted
CPO	4.389	0.156	Accepted
Authentic Pride	1.705	0.183	Accepted
Moral Pride	8.025	0.275	Accepted
Activated Product Related Identity	2.854	0.059	Accepted
Word-of-Mouth	2.050	0.130	Accepted
Product Satisfaction	1.587	0.243	Accepted
Hubristic Pride	0.357	0.707	Accepted
Collective Pride	2.786	0.021	Rejected

The results for the variables fail to reject the null hypothesis, which indicates that any differences between the respondents cannot be explained by the respondent's geographic region, except for collective pride since the null hypothesis was accepted as p values were <

0.05. For collective pride post-hoc comparisons using the Tukey HSD test indicated the mean score for South Wales (M=6.311, SD=1.167) was significantly different from the other two regions (North and Mid) which both had similar lower scores of (M= 5.792, SD = 1.789 for North Wales and M=5.825 SD = 1.967 for Mid Wales). This result could be explained by the number of BEV owners in each of these regions, where a higher number of BEV owners may stimulate and encourage feelings of collective pride to emerge.

6.6.4 Type of Ownership

Given the nature of the study and BEV ownership being able to take many forms of ownership, such as outright buy or private lease it was necessary to differentiate between the groups understand if any differences occurred among the 11 variables. Therefore, a one-way ANOVA test was therefore reapplied in this analysis on each type of ownership namely; outright purchase, private lease, lease by salary sacrifice scheme, company car, and car share. Table 6.26 presents the results.

Table 6.26 Results of one-way ANOVA test on Type of Ownership

Variable	F	Sig.	Null Hypothesis (Accept or Reject)
Consumer Technology Appropriation	0.656	0.623	Accepted
Environmental Concern	0.456	0.663	Accepted
IPO	4.278	0.002	Rejected
CPO	0.681	0.606	Accepted
Authentic Pride	0.746	0.707	Accepted
Moral Pride	1.031	0.355	Accepted
Activated Product Related Identity	1.219	0.302	Accepted
Word-of-Mouth	0.774	0.480	Accepted
Product Satisfaction	2.372	0.591	Accepted
Hubristic Pride	0.689	0.658	Accepted
Collective Pride	3.546	0.227	Accepted

Almost all the results for the variables fail to reject the null hypothesis, indicating any differences between the respondents cannot be explained by the respondent's type of car ownership except for IPO as the p value was < 0.05, accepting the null hypothesis. For IPO a post-hoc comparisons using the Tukey HSO test indicated a difference in the mean score

between ownership types. For those who outright purchased their BEV, the mean scores for IPO were higher than that any other ownership type (M= 5.728 SD= 0.728) as compared with the next closest score which was for private lease where the mean was (M=5.275 SD=1.193). This result overlaps with prior conclusions drawn on how outright purchases and access based ownership differ in feelings of IPO, where outright purchase seems to results in stronger feelings of "mine" due to the full legal ownership rights that come with it (Baumeister and v. Wangenheim 2014; Belk 2018; Fritze et al. 2020).

6.6.5 Car Brand

While the scope of the research was not entirely focused on differences in car brand types, this did play a significant role in the analysis particularly acting as a control variable when testing the direct, mediating, and moderating relationships. As highlighted in section 6.6, the car brands were grouped into luxury, premium and mainstream and when conducting a one-way ANOVA to test the differences in the group all 11 variables Table 6.27 shows the results:

Table 6.27 Results of one-way ANOVA Test on Car Brand

Variable	F	Sig.	Null Hypothesis (Accept or Reject)
Consumer Technology Appropriation	0.896	0.030	Rejected
Environmental Concern	1.548	0.214	Accepted
IPO	0.647	0.524	Accepted
CPO	0.935	0.393	Accepted
Authentic Pride	2.244	0.108	Accepted
Moral Pride	0.594	0.553	Accepted
Activated Product Related Identity	1.251	0.287	Accepted
Word-of-Mouth	0.141	0.05	Rejected
Product Satisfaction	1.022	0.045	Rejected
Hubristic Pride	0.124	0.883	Accepted
Collective Pride	1.812	0.165	Accepted

The results show that all variables fail to reject the null hypothesis expect for consumer technology appropriation, word-of-mouth and product satisfaction suggesting there is no difference between the respondent's car brand as the p value was > 0.05. A post-hoc comparison using the Tukey HSO test confirmed a difference in the mean score between car

brands for consumer technology appropriation, word-of-mouth and product satisfaction. For the BEVs classified under luxury car brands, the mean scores for consumer technology appropriation, word-of-mouth and product satisfaction were considerably higher than the respondents whose car brand is classified under premium or mainstream. Table 6.58 highlights the difference in car brand for each of these variables:

Table 6.28 Difference in Car Brand on Consumer Technology Appropriation, Word-of-Mouth and Product Satisfaction

Car Brand	Consumer Technology Appropriation	Word-of-Mouth	Product Satisfaction
Luxury	M=5.662 SD= 0.945	M=6.437 SD= 0.747	M=6.662 SD= 0.883
Premium	M= 5.112 SD = 0.815	M=6.053 SD= 0.911	M=6.257 SD= 0.906
Mainstream	M= 5.185 SD= 1.104	M=5.729 SD= 1.128	M=5.916 SD= 1.204

These results suggest how differences in car brands may impact the ownership experience either through the way the owners interact with the car's technology, the regularity of word-of-mouth communication made or the overall satisfaction levels.

6.7 Conclusion

This chapter presented in detail the findings of the quantitative phase of this study. Following the pilot survey analysis, where scale purification took place to increase the reliability of the survey items (retaining 57 items), this chapter presents the analysis and results from the main survey (n= 426). First descriptive analysis was conducted which showed the average respondent was male aged between 41-50 who is employed, living in the South Wales region, and has owned their current BEV between 1-2 years. Proceeding this, confirmatory factor analysis was preformed to assess goodness of model fit using 6 indicators based on measuring; absolute fit

indices, incremental fit indices, and parsimony fit indices. The results obtained after re-specifying the model showed good model fit: CMIN/df= 2.1; GFI=0.95; CFI= 0.93; TFI= 0.94; PNFI=0.85; RMSEA=0.046. Consequently, after conducting pre-analysis data screening, hypothesis testing took place where a range of statistical analysis techniques were used. These being; hierarchical regression analysis and path analysis (to examine mediating and moderating effects) which were all conducted using SPSS, AMOS and PROCESS macro Hayes. Throughout the analysis 4 control variables were used: gender, car brand, type of ownership and length of ownership. In summary, for each result from the hierarchical regression analysis, the standardized regression coefficient, R^2, R^2 change, F change and variance inflation factor was measured. The results show that appropriating technology is a stronger predictor than environmental concern for IPO feelings to arise. In particular, it was found that feeling in control over the plug in to charge system is the most impactful aspect of appropriating technology that led to feelings of IPO towards a BEV to emerge. Moreover, the results also showed, that environmental concern is a stronger predictor for feelings of CPO to arise than feelings of IPO. The results also showed that the strongest outcome effect for IPO was word-of-mouth, while for CPO it was product satisfaction. As for the path analysis the findings show that both hubristic and collective pride play a significant role in moderating the relationship between IPO and CPO and each of the three outcomes. The hypothesis formed to guide the analysis of this chapter are summarised in table 6.29 below where each result hypothesis relationship is also presented. Subsequently, based on the empirical evidence reported in the qualitative and quantitative phase, the proceeding chapter 7 presents a discussion of the study's findings and further presents the theoretical and empirical contributions, managerial implications, research limitations and suggested directions for future research.

Table 6.29 Summary of Results: Hypothesised Relationships		
Hypothesis	**Hypothesised Relationship**	**Result**
Hypothesis 1A	Consumer technology appropriation positively impacts IPO when the individual feels in control when using the charging system in their BEV.	Supported
Hypothesis 1B	Consumer technology appropriation positively impacts IPO when the individual interacts with their BEV using the smartphone application.	Supported
Hypothesis 1C	Consumer technology appropriation negatively impacts IPO when the individual uses the autonomous driving features.	Supported
Hypothesis 2A	Feeling in control when using the plug-in to charge system and smartphone application to interact with the BEV positively impacts IPO through the mediating role of authentic pride	Supported
Hypothesis 3A	BEV owners who express feelings of attachment towards the natural environment instigate feelings of IPO towards their car.	Rejected
Hypothesis 3B	BEV owners who assume a sense of responsibility towards preserving the natural environment instigate feelings of IPO towards their car.	Supported
Hypothesis 3C	BEV owners who feel a sense of moral obligation to take care of the natural environment instigate feelings of IPO towards their car.	Supported
Hypothesis 3D	BEV owners that collectively share feelings of attachment towards the natural environment with other BEV owners develop feelings of CPO towards the BEV owner's community.	Supported

Hypothesis 3E	BEV owners that collectively share a sense of responsibility towards preserving the natural environment with other BEV owners, develop feelings of CPO towards the BEV owner's community.	Supported
Hypothesis 3F	BEV owners that collectively share feelings of moral obligation to preserve the natural environment with other BEV owners, develop feelings of CPO towards the BEV owner's community.	Supported
Hypothesis 4A	Feelings of moral pride mediate the positive relationship between BEV owners who express environmental concern and feelings of IPO towards their car.	Supported
Hypothesis 4B	Feelings of moral pride mediate the positive relationship between BEV owners who collectively share feelings of environmental concern and feelings of CPO towards the BEV owner's community.	Supported
Hypothesis 5A	BEV owners who experience a high level of IPO towards their car are more likely to relate their self-identity with their BEV into their self-concept, leading to a stronger sense of identity.	Supported
Hypothesis 5B	BEV owners that hold collective feelings of psychological ownership towards the BEV owner's community, are more likely to echo the collectively identity observed with their self-identity, leading to a stronger sense of identity.	Rejected
Hypothesis 6A	BEV owners who feel high level of IPO towards their car, are more likely to speak positively about their ownership experience through word-of-mouth communication.	Supported
Hypothesis 6B	BEV owners who share collective feelings of psychological ownership towards the BEV owner's community, are more likely to engage in word-of-mouth communication to promote and praise the collective commitments and efforts made.	Supported

Hypothesis 7A	There is a positive relationship between BEV owners that report feelings of IPO over their car and levels of satisfaction with owning a BEV.	Supported
Hypothesis 7B	There is a positive relationship between BEV owners that report feelings of CPO towards the BEV community and levels of satisfaction with owning a BEV.	Supported
Hypothesis 8A	The effect of IPO on activated product related identity is moderated by feelings of hubristic pride	Supported
Hypothesis 8B	The effect of IPO on word-of-mouth is moderated by feelings of hubristic pride	Supported
Hypothesis 8C	The effect of IPO on product satisfaction is moderated by feelings of hubristic pride.	Rejected
Hypothesis 9A	Feelings of collective pride moderate the positive relationship between CPO and Activated Product Related Identity.	Supported
Hypothesis 9B	Feelings of collective pride moderate the positive relationship between CPO and word-of-mouth.	Supported
Hypothesis 9C	Feelings of collective pride moderate the positive relationship between CPO and product satisfaction.	Supported

CHAPTER 7

DISCUSSION AND CONCLUSION

7.1 Introduction

This chapter presents the discussions of the study's findings and its contributions to knowledge. A summary of the study's findings is first outlined in chapter 7.2 before discussing the relevance of these findings by presenting the theoretical research contributions in chapter 7.3. Proceeding this, chapter 7.4 offers the methodological and contextual contributions before presenting the practical implications in chapter 7.5 where propositions and strategies that can be used by managers and stakeholders to encourage individuals in Wales to own a BEV. Finally, this chapter concludes by addressing the limitations of the study and suggestions for further research in chapters 7.6 and 7.7 respectively.

7.2 Summary of Findings

The goal of this thesis was to observe and understand how and under what conditions does feelings of ownership of BEV owners arise by using the theoretical lens of PO (Pierce et al. 2003). Moreover, to extend our theoretical understanding on PO theory, this study also questioned whether and if so, how, feelings of private (authentic and moral) and public (collective and hubristic) pride might enrich ownership feelings. To achieve this, the following research questions were constructed following a review of the literature to guide the study:

- **Research Question 1** - What are the drivers that contribute to the development of PO at individual and collective level?

- **Research Question 2** - What are the consequences of feelings of individual and collective PO and how do these differ in BEV ownership?

- **Research Question 3** - How might different feelings of pride impact the development and consequences of both individual and collective feelings of ownership in the context of BEV ownership?

The study established empirical linkages of the key drivers of IPO and CPO in the context of BEV ownership and further presents the outcomes of having these feelings of IPO and CPO. Consequently, this research presents new knowledge on the self and car ownership behaviour, ownership feelings, the emotion of pride, and more broadly, the literature on sustainable transport from a consumer behaviour perspective.

First, the study found when BEV owners successfully appropriate the technology within the BEV, this significantly drives feelings of IPO (i.e. 'it's mine') over a BEV. Evidenced empirically during the qualitative and quantitative phases of the study [chapters 4.4.1 and 6.5.1]; gaining a sense of control over the plug-in to charge system and the smartphone application used to interact with the BEV, positively motivates feelings of IPO towards a BEV emerge, supporting H1A and H1B. Interesting between the plug-in to charge and smartphone interaction, not much of a statistical difference was found between them (B= 0.373 and 0.325 respectively) suggesting they both are equally important in prompting these feelings of control and autonomy relating to the BEV technology systems. However, the study also showed when owners interact with and use the autonomous driving features in their BEV such as self-driving and self-parking, the lack of physical interaction impede feelings of IPO to arise (B= -0.136), supporting H1C. The results taken together extend our understanding on technology appropritaion and PO by showing it is possible that in contexts such as BEV where technology interaction plays a major role during its ownership, appropritaing its technology can both lead and preclude feelings of IPO, settling contradictions and prior debates raised by scholars (Kirk et al. 2015; Puntoni et al. 2021; Longoni and Cian 2022; Smith et al. 2022).

Second, concern towards the natural environment was not only found to be another driver for feelings of IPO towards a BEV but can also drive feelings of CPO towards the BEV owners community (i.e. this community is 'ours') [chapters 4.4.2, 6.5.1 and 6.5.2]. This finding extends our knowledge on the link between the natural environment and PO and whether environmental concern can lead to feelings of PO, as conceptually argued by Süssenbach and Kamleitner (2018) and Peck et al. (2021). During both the qualitative and quantitative phase of the study it was found, when BEV owners assume feelings of responsibility, and moral obligation, which together reflect environmental concerns, this drives feelings of individual ("mine") and collective ("ours") PO in BEV ownership. In addition, the findings also showed that although feelings of attachment towards the environment does not lead to IPO towards the BEV, it does in fact lead to CPO feelings towards the BEV owner's community. Consequently, environmental concern has been shown to lead to both feelings of IPO and CPO, with the effect being greater for CPO than IPO. Furthermore, this finding also responds to Morewedge et al. (2021) and Peck and Luangrath (2022) call for to investigate whether individuals may develop feelings of IPO and CPO in the same context, confirming this speculation.

Third, the study revealed that feelings of privately expressed pride in particularly, authentic pride, mediates the relationship between technology appropriation and IPO, supporting H2A. First identified qualitatively and then confirmed quantitatively [chapter 4.4.1 and 6.5.4.1], this finding offers sound reasoning as to why successfully appropriating technology draws the self closer to the BEV. It was understood following successful feelings of appropriating technology, this triggers feelings of authentic pride to signal this achievement, strengthening the emotional attachment towards the BEV, thus driving feelings of IPO.

Fourth, this study identified another form of private pride - moral pride, an emotion yet to be considered in conjunction with PO theory. This facet of pride was found to mediate the relationship between environmental concern and both IPO and CPO. This emotion describing altruistic motives and moral beliefs, is argued to be an additional self-conscious emotion in the realm of understanding ownership feelings. The study showed during both phase 1 and phase 2 of the study, when BEV owners act on their environmental concerns by

choosing to own a BEV, this provokes a sense of moral pride, creating a deeper emotional interaction with their BEV for acting on their inner beliefs. In doing so this draws the self close to the BEV and instigates feelings of “mine”. On a collective note, it was found when feelings of moral pride are mutual amongst BEV owners, this emotion drives feelings of CPO towards the BEV owner’s community. In other words, reflecting feelings of proudness to be taking care of “our” environment.

Fifth, feelings of IPO were shown to lead to a psychological state of activated product related identity, a psychological state which reflect product-self judgement. This outcome captures how feelings of ownership can shape self-identity to align with the characteristics of the possession (Weiss and Johar 2013) [chapter 6.5.3]. This finding is consistent with earlier literature suggesting feelings of IPO impacts self-identity (Weiss and Johar 2018; Zhang et al. 2023). However, while prior research has suggested that CPO may lead to activated product related identity due to closeness between group level attachment and group identification (Ledgerwood et al. 2007; Szamatowicz and Paundra 2019), the quantitative findings reject these views as no statistical significance was found when testing this relationship. As side from IPO being a predictor, when IPO and authentic pride are in the same model as part of a serial mediation between technology appropriation and activated product related identity, IPO mediates the relationship. A similar result was found when testing the relationship between environmental concern and moral pride suggesting IPO can play the role as an antecedent and mediator.

Sixth, feelings of both IPO and CPO as part of BEV ownership were found to increase word-of-mouth communication [chapter 6.5.1]. This result echoes prior findings that IPO results in word-of-mouth as suggested by Peck and Shu (2009), Fuchs et al. (2010) and Kirk et al. (2015), while further echoing the views of Setiawan (2018) and Lisjak et al. (2021) that car ownership often results in word-of-mouth. In addition, however, this study also showed for the first time that feelings of CPO towards the BEV owners’ community also leads to word-of-mouth communication. Further, the study also revealed that, feelings of IPO have a stronger effect (B= 0.528) on the outcome of word-of-mouth than CPO (B= 0.365). Additionally, upon testing the serial mediation effect of authentic pride and IPO between technology appropriation and word-of-mouth, a significant result was found suggesting that

IPO can also be a mediator for the outcome of word-of-mouth. Additionally, when moral pride, IPO and CPO are added in the same model as mediators to test environmental concern on word-of-mouth, a partial mediation was found, indicating IPO and CPO can mediate the outcome of word-of-mouth. This finding adds to our understanding on PO theory in consumer research by showing how IPO and CPO can be partial mediators in the same model.

Seventh, IPO was marginally found to have a stronger effect than CPO on the outcome of product satisfaction from owning a BEV (B= 0.424 and 0.421 respectively) [chapter 6.5.3]. This finding expands on the theoretical understanding of the outcome of PO by showing, in addition to IPO leading to product satisfaction as argued by Fuchs et al. (2010) and Li and Atkinson (2020), feelings of CPO may also lead to product satisfaction. Moreover, when measuring the serial mediation effects of IPO and authentic pride between technology appropriation and product satisfaction, IPO was found to play a significant role in mediating this relationship. Similarly, when testing the serial mediating effects of moral pride, IPO and CPO on product satisfaction, IPO and CPO were both shown to partially mediate this relationship. This finding uncovers new knowledge in PO theory particularly on how IPO and CPO can co-exist in the same setting.

Eighth, feelings of pride expressed publicly specifically hubristic pride, were found to be a moderator between IPO and activated product related identity, and IPO and word-of-mouth as demonstrated in chapter 6.5.6. This result empirically confirms the conceptual thoughts shared by Kirk et al. (2015) and Ahuvia et al. (2018), who posited hubristic pride might strengthen feelings between IPO and word-of-mouth. Beyond this, the study empirically showed the relationship between IPO and activated product related identity, is moderated by hubristic pride as this feelings reflects superiority, hence offering further clarity on why the state of activated product related identity takes place.

Finally, feelings of collective pride, another form of public pride was identified to moderate the effects of CPO and each of the three outcomes. Previous literature suggested feelings of collective pride may be an outcome following feelings of CPO (Decrop and Derbaix 2010; Ahuvia et al. 2018). Although this study did not find this, the findings did show collective

pride to be a moderator, strengthening the relationship between CPO and each of three outcomes. These results further aid our understanding of how emotion in particular public pride shapes the outcomes of feelings of ownership.

In summary, this study addresses the research questions formed and shows how both feelings of IPO and CPO arise among consumers in sustainable transport for the first time, presenting the antecedents to these feelings as well as its outcomes. The consideration of private and public pride is argued to offer an explanation on how emotional responses bridge the self with ownership feelings, furthering our understanding of PO theory and of the ways in which it is developed and experienced.

7.3 Theoretical Contribution of the Research

Overall, this study makes several novel contributions to the field of sustainable transport and its limited literature on BEV ownership, while adding to the growing body of discourses on PO theory in consumer behaviour research. Although prior research indicates consumers tend to form psychological connections with their car (Dittmar 1992; Steg 2005; Ruvio and Belk 2013; Ye and Gawronski 2016), less is known about how this arise when owning a BEV. Adding to this, while scholars have applied PO theory to understand consumer's ownership feelings towards possessions, products and brands (Jussila et al. 2015; Swain and Kirk 2018; Peck and Shu 2018; Morewedge et al. 2021; Kumar 2022), scholars have yet to engage PO theory in sustainable transport contexts. This study therefore responds to this gap in knowledge by applying PO theory to understand how ownership feelings develop and arise towards BEVs.

First, this study sheds light on the limited knowledge on the self and BEV ownership and draws conclusions by exploring this behaviour among existing BEV owners. Second, using the theoretical lens of PO, this research adds to and builds on existing knowledge on consumers ownership feelings towards cars, by developing and validating a comprehensive 2-way model to explain how PO feelings towards a BEV manifest. Third, using an exploratory research design, this study provides empirical insights and uncovers new antecedents and outcomes of PO in the context of BEV ownership, revealing that the emotion of pride plays a

key role in navigating these feelings. Fourth, this study offers a key theoretical contribution to PO theory, by demonstrating empirically that consumers may develop and act on both feelings of individual and collective PO in the same setting.

In this way, this study is the first of its kind to apply PO theory on both a collective and individual level to uncover how feelings of ownership emerge in sustainable transport contexts by revealing the strategic drivers that lead to its development and. Additionally, this study offers an original theoretical contribution by arguing that feelings pride both private (authentic and moral) and public (hubristic and collective) are instrumental in the development and outcomes of ownership feelings.

This study offers new knowledge on consumers behaviour towards BEV ownership, by looking beyond how the socio-technical barriers of BEVs influence consumers decision to own (Egbue and Long 2012; Berkeley et al. 2018; Higueras-Castillo et al. 2020; Fevang et al. 2021; Secinaro et al. 2022). Rather, this study adds to the limited literature on understanding the consumer-self relationship when owning a BEV, by filling a gap in knowledge on why ownership feelings towards BEV arise.

Although scholars have argued that the self principally, self-identity plays a key role in consumers decision to own a BEV (Schuitema et al. 2013; Barbarossa et al 2017; Bobeth and Kastner et al. 2020), it become apparent that scholars have yet to challenge or deal with other areas of the self and BEV ownership, in particularly ownership feelings. To overcome this gap in knowledge, this study offers an in-depth insight into why feelings of ownership towards BEV emerge by using PO theory and drawing its findings from existing BEV owners. PO theory has been argued to be an important framework in consumer research to theorise ownership behaviour and indeed feelings of ownership towards a possession (Morewedge et al. 2021; Peck and Luangrath 2022). Despite studies using PO theory to examine ownership feelings across a range of consumption choices including rented fashion (Fritze et al. 2020), music and video streaming (Sinclair and Tinson 2017; Morewedge et al. 2021), virtual possessions (Luangrath et al. 2022), no study is yet to consider the consumer – car ownership relationship specifically with BEVs. Consequently, this study is the first to address the possible antecedents and outcomes of PO at both an individual and collective level in the context of BEV ownership.

By drawing on the theoretical discourse put forward by Gaskin (2012), Kirk et al. (2015) Süssenbach and Kamleitner (2018), Peck et al. (2021) and She et al. (2022), this study identified that, technology appropriation and environmental concern, are key strategic drivers for developing feelings of IPO towards the BEV. These drivers are argued to help forge feelings of ownership through achieving a sense of control over the BEV's technology and gaining knowledge about the consequences of damaging the natural environment (Peirce et al. 2003; Van Dyne and Pierce 2004). Nonetheless, this study found empirically in chapter 6.5.1 that, technology appropriation has a higher correlation to IPO than environmental concern.

It is argued when BEV owners develop a sense of autonomy and control over technology by interacting and understanding its system, this allows the technology to become one with the self (Peirce et al. 2003), instigating feelings of "mine" towards the BEV. This finding extends the conceptual work of Kirk et al. (2015) by confirming that indeed technology appropriation can take place in both physical and digital technologies (plug-in to charge system and smartphone application respectively). To shed light on how this development arises, this study found gaining a sense of control with the BEV technology, ignites feelings of authentic pride for successfully overcoming self-efficacy barriers, which strengthens the emotional attachment towards the BEV and consequently feelings IPO. This finding advances PO theory development by showing how authentic pride acts as a bridging mechanism of explaining why feeling a sense of control can lead to feelings of IPO. This empirically drawn conclusion is the first study to confirm the propositions suggested by Kirk et al. (2015), and proving that authentic pride, technology appropriation and IPO are indeed connected.

Extending this, the study also showed when consumers engage with the autonomous technologies in their BEVs such as self-parking, this restricts physical interactions and user input, hence bypassing the feeling of being in control and impedes feelings of IPO to emerge. While this finding coincide with conclusions drawn by Puntoni et al. (2021), Longoni and Cian (2022) and Smith et al. (2022), this result taken together with the previous finding involving sense of control show that it is possible that technology appropriation can both lead and impede feelings of IPO. This insight therefore advances the theoretical work of PO by showing how in some cases such as BEV ownership, sense of control is not a linear and can be depended on whether the technology in question offers the individual feelings of autonomy which ultimately impacts their attachment feelings.

With regards to concern towards the natural environment, this study enlightens the lack of clarity of the mechanisms that instigate PO concerning the environment as conceptual and empirically debated by (Süssenbach and Kamleitner 2018; Nijs et al. 2021; Peck et al. 2021; She et al. 2022). While Süssenbach and Kamleitner (2018) and Nijs et al. (2021) indicate feelings of responsibility should lead to feelings of PO towards the environment and targets associated with it, Peck et al. (2021) and She et al. (2022) suggest that these feelings stem from inner moral obligation beliefs.

This study reveals how through knowledge gained about the consequences of damaging the natural environment (Peirce et al. 2003), environmental concern can lead to feelings of IPO towards the BEV and CPO towards the wider community of owners. As such, this study responds to these debates and contradictions by revealing feelings of IPO towards a BEV may emerge from both assumed responsibility feelings and moral obligations beliefs to take to care of “my” environment. Moreover, it became apparent that feelings of private pride, specifically moral pride, acts a key mechanism in bridging the relationship between environmental concern and IPO. This feeling of genuine altruistic motives i.e. sense of achievement for fulfilling inner beliefs (Etxebarria et al. 2015; McLatchie and Piazza 2017), advance the theorisation of PO by showing the emotional reasoning as to why environmental concern may lead to PO.

Beyond environmental concerning impacting IPO, the study also shows this can instigate feelings of CPO. This study therefore responds to Morewedge et al. (2021) and Peck and Luangrath (2022) steps for further research by revealing that IPO and CPO can co-exist in the same context. The findings support the notion that when BEV owners perceive the natural environment as a public space shared with other owners, it creates a collective belief that ‘this is “our” environment and we should take care for it’ (Pierce and Jussila 2011; Peck et al. 2021; Wang et al. 2023). These beliefs stem from the shared feelings of responsibility and moral obligations to care for the natural environment confirming theorisations posited by (Süssenbach and Kamleitner 2018; Nijs et al. 2022). This implications of this motivate BEV owners to feel CPO towards the BEV community i.e this is “our” community as together ownership of a BEV collectively signals the positive action taken towards caring for “our” environment. This study further advances the work on PO theory by showing, moral pride plays a key role in facilitating this behaviour. When collective feelings of environment

concern are symbolised through ownership of a BEV, this drives feeling of moral pride which motives owners to feel emotional attachment towards “their” community.

This work also contributes to the existing knowledge of the outcomes of PO for both IPO and CPO elaborating on the inconsistent findings for the outcomes of PO (Peck and Shu 2018). This study goes beyond confirming the outcomes of IPO and CPO but also shows the significance that feelings of public pride (hubristic and collective) can have on these developments. In the case of feelings of IPO towards the BEV, this study provides a profound insight into how this feeling can result in the owner experiencing a psychological state of activated product related identity, engage in word-of-mouth communication and experience higher product satisfaction. Expanding on, the findings showed when BEV owners hold high feelings of hubristic pride i.e. sense of superiority over others (Tracy et al. 2007; Tracy and Weidman 2021), this strengthens the relationships between IPO and activated product related identity and word-of-mouth because of the desire for self-enhancement and signal superiority over others (particularly non BEV owners) to further enhance the self. However hubristic pride was not to strengthen the outcome of product satisfaction indicating owners do not need to feel superior to others in order to highly value their BEV. This finding contributes to the knowledge on PO theory by demonstrating the relevance that hubristic can have in achieve the outcomes of IPO.

Unlike IPO, the psychological state of activated product related identity was not found to be a direct significant outcome of feelings of CPO despite the qualitative findings, prior studies and indeed the theoretical work of CPO suggesting otherwise (Ledgerwood et al. 2007; Pierce and Jussila 2011; Szamatowicz and Paundra 2019; Nijs et al. 2021). However, in the presence of collective pride as a moderator, this relationship was found to be significant. Although Decrop and Derbaix (2010), Sullivan (2014) and Ahuvia et al. (2018) argued collective pride might possibly be an outcome of collective ownership feelings, their study’s failed to show the relevance of this. This study therefore contributions to a gap in knowledge showing how high levels of collective pride stemming recognising the collective efforts BEV owners are doing to protect the natural environment by owning a BEV can to the group members experiencing this psychological state of activated product related identity shaping the construction of the group’s identity. With regards to the other outcomes, the study also builds on PO theory showing for the first time that feelings of CPO can lead to word-of-

mouth communication and higher levels of product satisfaction. Furthermore, revealing high feelings of collective pride strengthened these outcomes indicating this celebratory emotion stemming from the collective ownership feelings towards BEV ownership plays an active role in BEV owners communicating their collective efforts of caring for the natural environment with others and also valuing and appreciating their BEV more highly.

Next, beyond contributions to PO literature showing IPO and CPO can be an outcome and also a predictor, the study argues that IPO and CPO may also be mediators between technology appropriation and environmental concern and each of the three outcomes. As shown in chapter 6.5.4.2. Although this goes beyond the primary focus of the study, this finding does coincide with other researchers who argue IPO can act as a mediator (Avey et al. 2012; Wang et al. 2019). However, whilst the studies show this may be the case in contexts such as employee relations and the natural environment, the study is the first to suggest feelings of IPO mediate the relationship between technology appropriation and; activated product related identity, word-of-mouth and product satisfaction. This contribution therefore responds to Peck and Shu (2018) call to extend our understanding on PO theory by identifying that IPO plays a unique and multidimensional role in understanding consumer behaviour particularly behavioural and attitudinal outcomes. As for CPO, this was found to be a mediator specifically between environmental concern and; word-of-mouth and product satisfaction. In recent examination of PO (Pierce et al. 2020; Wang et al. 2023), scholars have questioned whether CPO may also be a mediator. The study responds and contributors to PO theory and these remarks by revealing empirically that CPO can indeed be a mediator during theory development.

7.4 Methodological and Contextual Contribution of the Research

On a methodological level, this study added to the way in which knowledge concerning PO is gained by showing how an exploratory research design with a pragmatic philosophical standpoint can be used to uncover rich, in-depth interpretations. Using a two-phase data collection, this study uncovered new information on PO and indeed BEV ownership feelings by first extending the discourses and enquires from the literature review qualitatively to better understand its application in BEV ownership, then by measuring a series of hypothesis quantitatively to draw conclusions. In both phases, this study obtained data from existing BEV owners as opposed to the widely adopted approach in the field of sustainable transport of observing consumers intention, thus confronting the intention-behaviour gap (Davies and Foxall 2002; Foxall 2007; Hassan et al. 2016).

Whilst previous studies concerning PO adopt a quantitative approach relying mainly on surveys and experiments (Peck and Shu 2009; Fuchs et al. 2010; Pandura et al. 2017; Weiss and Johar 2018), this study favoured a mixed method approach. First the study conducted semi-structured interviews by exploring feelings of PO among 24 BEV owners in Wales (qualitative) and then proceeded to confirm the hypothesis drawn quantitatively using surveys and collecting 426 responses from existing BEV owners in Wales. Although BEV ownership continues to grow year-on year, researching enquiring consumers behaviour is not only argued to be underdeveloped in marketing and consumer academic research, but heavily survey focused (Qian et al. 2023). Hence, this study contributes methodologically showing that studying seeking to better understand PO theory can generate findings beyond traditional quantitative approaches, particularly in new and underdeveloped contexts such as BEV ownership.

Another methodological contribution concerns the instrument scale used during the quantitative phase of the study in particularly the items constructed to measure CPO and collective pride. This study therefore responds to Pierce and Jussila (2011), Harth et al. (2013) and Pierce et al. (2020) call on researchers to develop and clarify a scale to measure these. Consequently, this study developed and verified a series of scale items by using EFA and CFA to measure ownership feelings at an individual and collective level, as well as feelings of pride for four different facets (authentic, moral, hubristic and collective). Hence,

this study contributes methodologically by offering survey items designed to understand ownership feelings in sustainable transport contexts, whilst advancing our understand on PO theory.

Finally, this study offers a contextual contribution, as it is the first study to explore in-depthly, consumer behaviour towards BEV ownership in Wales. Whilst scholars have explored consumers behaviour towards BEV ownership in other UK nations namely; Scotland (Beeton et al. 2016), Northern Ireland (Morrissey et al. 2016) and England (Berkeley et al. 2018), this study presents insights for the first time on consumers behaviour towards BEVs in Wales, bridging a gap in literature. Thus, study adds to the growing body of studies designed to understand consumer reaction towards BEVs, whilst offering a different perspective on gaining knowledge by considering the significance of feelings of ownership during BEV ownership. The study and its findings therefore contribute to the Welsh Governments proposals in achieving an ultra-low transport system (Sustainable Transport Hierarchy Plan) which is largely contingent on increasing widespread BEV ownership (Welsh Government 2021). Finally, given the size of Wales geographically, this study contributes to the growing body of literature of understanding consumers behaviour towards BEV ownership in geographic similar contexts where BEV ownership levels are also low despite there being a high percentage of car owners by population.

7.5 Management and Policy Implications

Although this research was conducted to extend academic knowledge offer original contribution to theory, the findings also several critical avenues to BEV marketing practitioners, representatives of Wales Transport Strategy, and BEV industry stakeholders to consider. Overall, this study offers several strategies for how ownership of a BEV can be augmented in the backdrop of an emerging transportation market.

First, the study showed that feelings of PO towards a BEV have significant implications for the owner's ownership experience. Therefore, it is recommended that BEV marketers should consider fostering the relevance of PO, both at an individual and collective level to prospective owners. To achieve this, marketers could offer consumers hands on knowledge on the unique ownership experience that can be developed by employing motivating

messages to potential owners signalling the emotional connections between the self and owning a BEV. In practical terms, this can be employed by conveying how choosing to own a BEV means ‘‘I am taking care of *my* environment’’ or ‘‘together let’s take care of *our* environment by driving electric’’. On the other hand, BEV ownership should be promoted by reinforcing the value and richness of needing to gain a sense of control over how to use the technology embedded in BEVs particularly towards the plug-in to charge system. This would create a knowledge sharing space for consumers to improve their technical awareness on BEV charging and reinforcing the findings show that developing a sense of autonomy can overcome the challenges and barriers consumers have otherwise placed towards charging infrastructure and the charging system (Rezvani 2015, Asadi 2018, Singh 2020).
Extending on this, BEV marketing practitioners and BEV charging stakeholders should aim to connect with consumers using feelings of authentic pride particularly as an output of gaining confidence with interacting with the BEV’s technology. By providing a cultivating sense of success and achievement of appropriating technology through persuasive information, marketers channel this and communicate strategies designed to motivate potential consumers to consider and own a BEV. This finding is particularly important, as most BEVs at present have lower driving ranges than their ICE counterparts and therefore need to be recharged often. Therefore, the opportunity for feelings of pride to be captured and transpired is likely given owners are regularly exposed to charging and interacting with the plug-in to charge system either privately or publicly. Therefore, if existing and potential owners feel a sense of control over the BEV’s technology, this has the potential to engage in positive word-of-mouth communication and reflecting on their feelings of pride and the positive charging experience indirectly promoting BEVs’. Overall, this finding is essential to allow manufacturers to recognise their responsibility in reducing any risk doubts for interacting with the BEV’s technology in order for prospective consumers to own a BEV without hesitation on technology appropriation abilities.

Third, as this study demonstrated the importance of collective feelings of ownership and creating a sense of exclusivity and belonging to a community of BEV owners, marketers should focus on the psychological disposition CPO has on consumers’ evaluations of BEV’s. Marketing practitioners should therefore not overestimate the significance and relevance that, by feeling part of a collective group, this not only symbolise collective responsibility

and commitment towards the natural environment, but also the positive associations this can have with the BEV brand. Given how some responses offered by BEV owners in this study, particularly those that own a Tesla emphasised their excitement and strong feelings of togetherness with other Tesla owners, marketers should acknowledge the importance of having a sense of brand community with its BEV consumers' particularly when most consumers already feel connected with other BEV owners. Initiatives for potential owners such as inviting them to share experiences with other BEV owners would be welcomed. For instance, hosting brand community events or charging network meetups may help in fostering a sense of belonging and thus accentuate attachment to the BEV community. Moreover, another worthy approach is communicating the desire to achieve feelings of collective pride as an outcome of feeling part of a wider community that owns a BEV. The study indeed demonstrated collective pride serves as an important tool for BEV owners to feel satisfied and strongly value ownership of a BEV.

Fourth, this study offers implications at a policy level. The findings encourage policymakers to help stimulate and overcome consumers resistance to BEVs by educating consumers and broadcasting objective information about the relationship between Wales's natural environment and the benefits that ownership of a BEV can have towards conserving it. Policy makers should explore initiatives and communication channels designed to encourage Welsh consumers to engage in collective stewardship behaviour. For instance, one visual communication that can be drawn from this study is addressing Wales as one unified nation, to take care for "our" environment by seeking to own a BEV. This concept extends the conclusions drawn by Peck et al. (2021) who believes through collective environmental stewardship, a rise in sustainable behaviours can occur among consumers.
Finally, policymakers should consider connecting with consumers' perceived sense of control and communicate that as part of the 'Wales Transport Strategy', public charging infrastructure will be designed to look beyond delivering the best charging output both practically and economically, but functionally too, as this would create a positive image and attitude regarding the acceptance BEVs. This proposal is strengthened by the study's findings in that that raising consumers' confidence concerning charging can be achieved beyond simply offering more public charging stations, but chargers that are easy to feel in control over and easy to use.

7.6 Research Limitations

While this study represents an initial step towards addressing an important knowledge gap in the literature, the study has some limitations. First, because this study was conducted during the COVID-19 pandemic, some methodological challenges were faced, particularly during data collection. Although the study planned to conduct face-to-face interviews, because of social distancing restrictions, all interviews conducted in this study were conducted online. The drawback of this is how online interviews can make it challenging to establish a comfortable open atmosphere for both the interviewer and the participant. Although interesting themes did emerge, the use of online interviews may not accurately capture non-verbal cues, such as body language and gestures accurately making it more challenging to assess the participants' responses when describing their BEV ownership experience (Keen et al. 2022).

Second, during the COVID-19 pandemic the automotive industry suffered a worldwide shortage of semiconductor shortages (Ramani et al. 2022), which had drastic implications on the number of BEVs manufacturers could produce, restricting the supply of BEV on the market and directly influencing consumers' decision-making. This meant that investigating a context like Wales, whereas of Q2 of 2023 (1.1%) of all cars are BEV's, imposes challenges on recruiting participants. While the study gathered a strong sample size for both Phase 1 and Phase 2 of the study (24 interviews and 426 survey responses from BEV owners in Wales), a larger sample size would be beneficial given the range of BEV manufacturers in the market. Nonetheless, this study captured a broad spectrum of owners from 20 different brands across a range of mainstream, premium and luxury BEV brands.

Third. since 75% of the survey responses were owners who owned their BEV within the last three years, this included the substantial time period forgone due to lockdown restriction. The implication of a lack of time spent with their car may have understated their true feelings of ownership. However, despite attempts to control this by approaching participants who owned their BEV for more than three years, the automotive industry in the last three to four years has seen a rapid transition towards diffusing BEVs which naturally meant

participants of the study are likely to be within a 1 to 2 year ownership timeframe. Fourth, in both Phase 1 and Phase 2 of data collection, the generalisability of the study's findings may be limited in understanding PO theory since the study captured a snapshot of respondents' feelings of PO at a specific point in time. This meant the findings perhaps overlooked the temporal dynamics or causal relationships between variables observed. Consequently, this might mean the study encompassed a self-selection bias. Respondents who agreed to take part in the study, particularly those that are recent owners of BEVs, might have had a positive attitude towards BEV's which could have overstated their true feelings and thoughts towards their BEV. Therefore, this potential bias must be reflected upon when interpreting and generalising the results. Extending this, since the study included self-reported measures to assess PO and feelings of pride, biases such as social desirability might have had an impact on the accuracy and reliability of the data. As outlined by Krumpal (2013) and White et al. (2019) social desirability can impact the reliability of the result particularly in sustainable consumption studies where consumers strive to make a positive impression on others by selecting sustainable options to convey social status. Social desirability bias may also have existed when respondents shared their opinions on CPO feelings and collective pride towards the wider BEV community in a fashion which elevates, enhances and protects their perceived image and group identity.

Finally, the study was contextually focused on Wales, a country where sustainability and climate change agenda goals are embedded into the constitution (Welsh Government 2016; Welsh Government 2019). Thus, while the study focused on feelings of ownership towards BEVs providing opportunities for learning, the study and its findings might not translate neatly into other BEV owner contexts such as wider UK and Europe which have different goals and agendas in policymaking. Moreover, since this is the first academic study exploring the context of Wales and BEV ownership, further research into car ownership feelings and behaviour in Wales is needed given the attention shown towards increasing BEV ownership by the Welsh government.

7.7 Directions for Further Research

Although this study offers several meaningful contributions, particularly to PO theory, future researchers could expand its scope even further. First, beyond ownership of BEV's, policymakers, stakeholders and indeed academics, are anticipating that the future of sustainable transport will also involve ownership other electric mobilities such as e-bikes and e-scooters (European Commission 2020; Curtis 2020; Qian et al. 2023). Therefore, researchers are encouraged use the foundations of this study's theoretical work and apply it to other ownership mobility contexts.

Second, given that the theory of PO is grounded in the development of ownership feelings, considering the dimension of time and the role it plays in fostering ownership feelings is a fruitful avenue for further research. As reported by Jussila et al. (2015) and Peck and Shu (2018), feelings of PO particularly towards possessions and products do tend to strengthen over time. Therefore rather than adopting an exploratory research design as shown in this study or an experimental design, as shown by Fuchs et al. (2010), Weiss and Johar (2018) Smith et al. (2022), which both observe PO at one point in time, observing and measuring feelings of PO and ownership behaviour through a longitudinal research design could offer valuable insights into the development and trajectory of PO and its underlying mechanisms. Building on this conducting a study in this manner might shed light on which feelings of ownership arise first individual or collective? Such an approach, particularly with understanding BEV ownership behaviour would thus expand our understanding of identify fluctuations and hidden potential causal relationships that might otherwise be obscured in a cross-sectional study. In that regard, future researchers are also encouraged to investigate whether feelings of IPO can change if any three of the key motives for PO (sense of control, knowledge gain, and investment of the self) are disrupted during ownership. Continuing with this theme of time, it would be interesting to learn whether changes in CPO towards the wider BEV community fade over time as ownership rates of BEV increases and the perception towards the BEV owner's community is no longer perceived as exclusive and unique. Subsequently, assessing how this might impact outcomes such as word-of-mouth and product satisfaction is necessary. Another benefit of a longitudinal designed study is that it allows researchers to encompass what moment feelings of pride arise based on select

experiences and memories. As noted by Ahuvia et al. (2018) and Tracy and Weidman (2021), pride in ownership in particular possessions can be unstable causing these feelings to increase or decrease over time. As this study shows, pride whether that expressed privately or publicly, is closely linked to the development and outcomes of feelings of ownership. Therefore, it would be interesting to observe the differences between those who hold feelings of pride at the beginning of their BEV ownership, and with how they felt after a certain number of miles had been driven with the car. This approach should allow for a refined observation of how the element of time as well as experience with the car in particular feeling of control over its technology have on ownership feelings.

Third, another research avenue that deserves further investigation would involve considering other relevant antecedents to feelings of IPO and CPO in the context of BEV ownership and indeed other sustainable transportation. While the study verified that environmental concern leads to collective feelings of ownership towards the BEV community, the qualitative findings revealed how some BEV owners, particularly Tesla owners feel a sense of brand PO. Further research should analyse and extend these findings by exploring the extent to which collective brand related ownership i.e “our brand” through intimate knowledge and investment of the self may disrupt feelings of collective PO towards the BEV owner’s community. Would BEV owners who own a Tesla for instance and identify strongly with the brand display collective territorial behaviours (Brown and Zhu 2016; Kirk et al. 2018) to protect “our” brand when other branded BEV owners threaten the brand image because of the conservational views expressed by Elon Musk?

Fourth, the success of the BEV market is not only driven by established car brands, but also the rise of new and exciting BEV star-up brands that have entered at the market (Wen 2022). A number of brand such as; Rivian, Polestar, Nio, Lucid and Genesis has gained attention from perspective BEV owners and policy makers (Jiang and Lu 2023). Hence, one avenue of research relevant to PO theory would be to compare the differences in feelings of PO towards an established brand in which the consumer may already have owned a car from and a new car brand, such as Lucid. In doing so, it is anticipated that the dynamic relationship between environmental concern and IPO will have a significant impact if the car brand continues to produce ICE or is a brand that is purely focused on BEV and therefore more closely aligned with the owners concerns about the environment.

Fifth, this study is based on a sample of BEV owners from Wales, and would therefore benefit from reproducing this study in other countries that share similar contextual dynamics and government driven agendas to increase BEV ownership. This would facilitate a cross-cultural comparison between the study and another context, uncovering valuable insights particularly between sociodemographic related factors and feelings of PO. Extending this scope of work to compare two different car ownership cultures by employing Hofstede's culture dimensions would also be highly beneficial. In some cultures, car social interaction and communities play a key role in shaping attitudes towards car ownership. It would therefore be worthwhile to identify the differences in PO feelings between cultures where shared, access based, and carpool car ownership is common such as California and cultures where private car ownership is encouraged such as Melbourne.

Sixth, the study focused on only one of the five self-conscious emotions (pride) and hence did not observe the others namely; guilt, envy, embarrassment and shame (Tracy et al. 2007; Robins and Schriber 2009; Tracy and Weidman 2021). Referring to Onwezen et al. (2013) and Antonetti and Maklan (2014) study which explored the relevance of guilt on intention for sustainable behaviours, in contexts such as BEV, e-bike, or e-scooter ownership, exploring how guilt as a mechanism may play a role in the relationship between environmental concern and feelings of individual and collective PO may yield insightful contributions to PO theory. This will be particularly useful in studies that explore BEV ownership behaviour when the sample also owns a second car, which is an ICE and may subsequently experience feelings of guilt as a result of owning both.

Lastly, with developing this research, I intend to publish: one paper focusing on the drivers and feelings of private pride towards feelings of IPO and CPO in the context of sustainable transportation i.e., BEV ownership (potential target of Transport Journal Part D). One paper based around the outcomes and feelings of public pride as part of feelings of attaining IPO and CPO using BEV ownership as a context of sustainable transport (potential target of Journal of Consumer Behaviour) and one based on the literature review conducted in the study emphasising the need to advance the theoretical work on both IPO and CPO the consumer realm particularly in sustainable transport (potential target of Consumer Psychology Review).

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APPENDICES

APPENDIX A (Ethics Approval for Interview with BEV Owners)

Cardiff Business School
Ysgol Busnes Caerdydd

14 January 2022

Dear Omar Mohammed,

Research project title: Sustainable Transport. A Behavioural Analysis Investigating the Implementation of Battery Electric Vehicles in Wales

SREC reference: 620.

Ethical Opinion:

The School Research Ethics Committee (SREC) reviewed the above application via its proportionate review process. The Committee gave a favourable ethical opinion of the above application on the basis described in the application form, protocol and supporting documentation.

Any substantial amendments to documents previously reviewed by the Committee must be submitted to the Committee via CARBS-ResearchEthics@cardiff.ac.uk for consideration and cannot be implemented until the Committee has confirmed it is satisfied with the proposed amendments. The Committee reminds you that it is your responsibility to conduct your research project to the highest ethical standards and to keep all ethical issues arising from your research project under regular review.

Yours sincerely,
Dr Carmela Bosangit
Chair of School Research Ethics Committee.

APPENDIX B (Interview Guide BEV Owners)

Background / Warm up Questions:

1) So, to start with do you want to tell me a bit about your background? Where are you from?
2) Do you feel your line of work has shaped your identity or vice versa? Prompt - Did this have any effect on the possessions or materials you decide to consume or own?
3) [before we talk about BEVs specifically] do you consume any environmentally friendly products? Prompt - You mention ____ can you talk more about that?

Experience with BEV

5) Can you tell me a little about your recent purchase of BEV? -what do you like about your BEV? Why? What do you don't like about your BEV? To what extent brand matter in your decision to choose BEV? Could you tell me how you felt when you first bought the BEV? Prompt - Can you explain why you felt such a way? Follow up - Would you say your BEV represents who you are either in a physical or symbolic manner.
6) For how long have you owned your BEV? Was this an outright buy, lease, company car or part of a car share? Did you have any experience of Electric cars prior to owning one?
7) Can you tell me about your BEV experiences so far? Follow up -What car brand is your BEV? You mention____ why do you consider this a negative experience?
8) Would you say you have grown to feel attached to your car? What is it about this that makes you feel this way?
9) Have you had emotional attachment to your previous cars?
10) Do you feel that driving your BEV enhances your identity whether it is to the self or to others?
11) Have you made any customisation or modifications to your car to coincide with your identity? Prompt -Was this done to help you feel more attached to your car? Would you say your car is therefore a physical or symbolical extension of yourself? Prompt - So, If I can paraphrase what you said. I'm hearing that _____ is that correct?
12) What makes you feel that your car is "mine"? Do you charge your car at home? Does charging at home make you feel that your charging station is "yours' only? Follow up - Does this shape your psychological attachment to the car? Follow up- Does feeling connected to the environment make you feel that driving electric is taking care of your environment?
13) Does owning a BEV make you feel you are part of wider community that drives greener and sustainable cars? Prompt - Can you clarify what you meant by that?
14) Do you feel that since owning a BEV you feel 'connected' / can relate to other BEV owners? Follow up - Does it help that other BEV owners undergo similar experiences with charging make you feel a sense of togetherness?
15) What impact has owning a BEV had on you personally? Follow up - Does your experience of owning a BEV encourage you to talk about this with others? Follow up - Do you feel there is any overlap between owning a BEV and your personality / identity.
16) Do you feel proud of your car? Follow up - What is it about the car that makes you feel this way? (Brand, Style, Colour, Environmental Benefits, using latest tech)
17) Does owning a BEV make you feel proud for showing yourself and others you are taking care of the environment? Prompt - How so? In What way? Follow up - Are these feelings of pride common with other drivers? Is there a collective sense of feeling proud for owning a BEV?

APPENDIX C (Interview Consent Declaration – BEV Owners)

The research is organised by Omar Jamal Mohammed in Cardiff University as part of the Doctorate in Philosophy in Business and Management, supervised by Dr Carolyn Strong, Dr Zoe Lee and Professor Gordon Foxall.

Participants will be asked to discuss on their feelings of ownership and pride towards their BEV. It is expected that your involvement will last between 60 - 90 minutes. A series of questions will be asked for you to share your opinion and thoughts and if you do not wish to answer the question that is acceptable, and we will proceed to the next. This interview will take place online using Microsoft Teams which will be audio recorded.

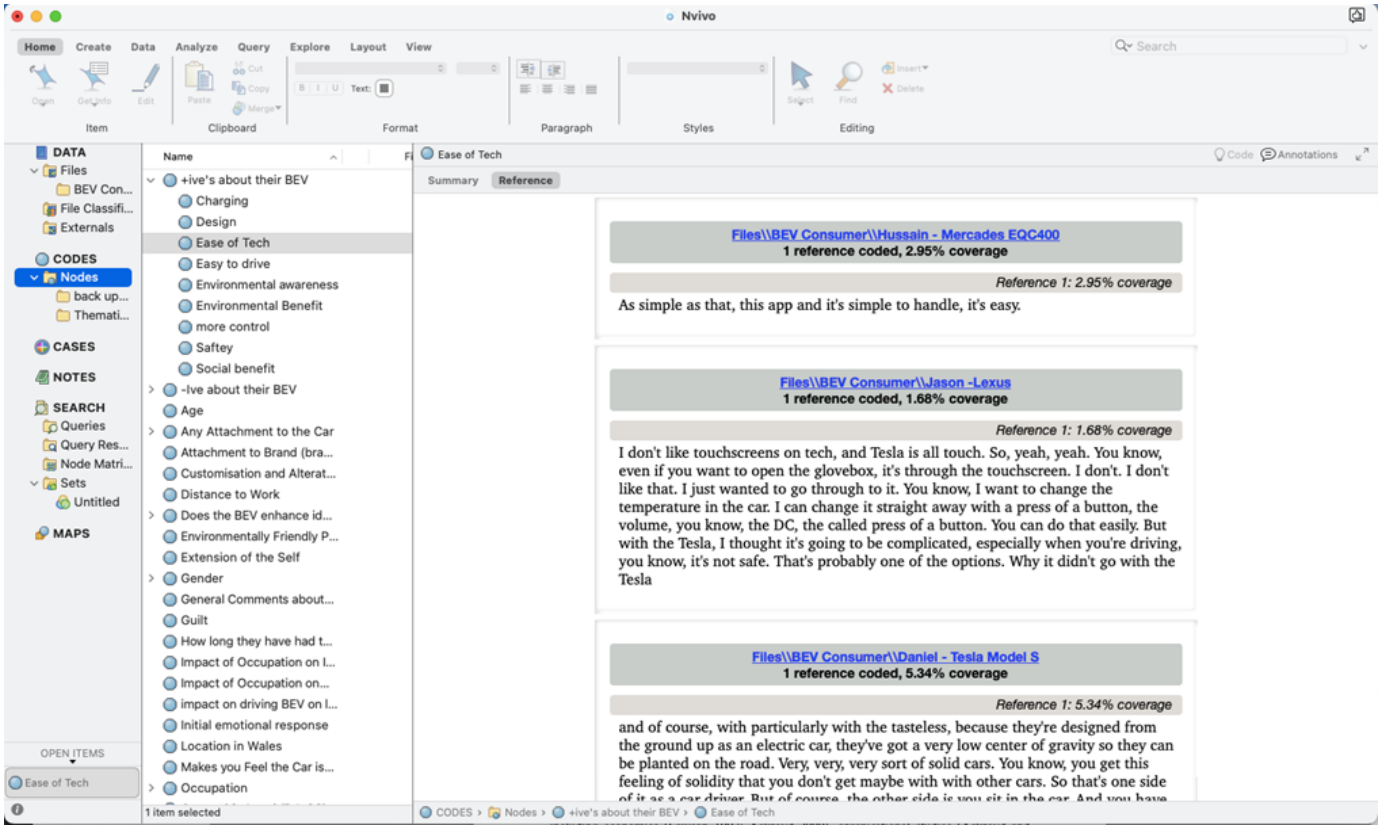
Your participation during the interview is entirely voluntary and it is up to you to decide whether or not to take part. You are free to withdraw your consent to participate in the research project at any time, without giving a reason, even after signing the consent form by contacting the researcher (MohammedO@cardiff.ac.uk) or the supervisors listed above.

All obtained information during the interview will be kept anonymously and used correctly in accordance with the 2018 General Data Protection Regulation (GDPR). To ensure this during the analysis of the results and the write up process, pseudonym names will be given to protect your identity.
The results of the research project will be published in the academic field such as conferences and academic journals however participants will not be identified.

By signing this form, **I consent to participate in the study conducted by Omar Jamal Mohammed of Cardiff Business School. I am also happy for the interview to be audio recorded.**

Name of participant (print)	Date	Signature

APPENDIX D (Example of Initial Coding of Themes from Interviews - Nvivo)



Above: Screenshot from NVivo showing early coding analysis

Below: One of many mind maps developed to derive themes from interview data

APPENDIX E (Interview Guide Marketing Practitioners)

1) From a marketing and strategy perspective what more needs to be done to develop the BEV market?

2) What do you feel are some of the biggest challenges face by consumers when seeking to own a BEV? Prompt - You mention ____ can you talk more about that?

3) How significant do you think is attention to the individual self as a strategy to promote a BEV?

4) What kind of personalities or identities have you learnt about consumers that coincide strongly with BEV? You mention ____ can you talk more about that?

5) What have you learnt from consumers about how they feel psychologically towards their car?

6) Would you say this is influenced by attaining a stronger psychologically attachment to feel the car is "mine"? Prompt - How so / in what way?

7) What are your thoughts on BEV being a shared experience with others since as a unit, BEV drivers are driving environmentally consciously?

8) I have learnt that consumers may develop feelings of pride towards possessions and materials they own including cars, what are your thoughts that marketing a BEV can emit feelings of pride? Prompt - Are these feelings of pride towards the environment (the macro) or the self (the micro). So, If I can paraphrase what you said. I'm hearing that _____ is that correct?

APPENDIX F (Interview Consent Declaration – Marketing Practitioners)

Cardiff Business School
Cardiff University

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

The research is organised by Omar Jamal Mohammed in Cardiff University as part of the Doctorate in Philosophy in Business and Management, supervised by Dr Carolyn Strong, Dr Zoe Lee and Professor Gordon Foxall.

This interview will involve exploring the current BEV consumer market trends and discussing what makes owning a BEV unique and asking for your opinion and expertise on the matter. This will facilitate the discussion to explore the main purpose of the research project which is to discuss how consumers develop feelings of ownership towards their BEV and how

feeling pride develop and enhance the feelings developed towards their BEV. It is expected that your involvement will last between 60 - 90 minutes. A series of questions will be asked for you to share your opinion and thoughts and if you do not wish to answer the question that is acceptable, and we will proceed to the next. This interview will take place online using Microsoft Teams which will be audio recorded.

Your participation during the interview is entirely voluntary and it is up to you to decide whether or not to take part. You are free to withdraw your consent to participate in the research project at any time, without giving a reason, even after signing the consent form by contacting the researcher (MohammedO@cardiff.ac.uk) or the supervisors listed above.

All obtained information during the interview will be kept anonymously and used correctly in accordance with the 2018 General Data Protection Regulation (GDPR). To ensure this during the analysis of the results and the write up process, pseudonym names will be given to protect your identity.
The results of the research project will be published in the academic field such as conferences and academic journals however participants will not be identified.

By signing this form, **I consent to participate in the study conducted by Omar Jamal Mohammed of Cardiff Business School. I am also happy for the interview to be audio recorded.**

Name of participant (print)	Date	Signature

APPENDIX G (Ethics Approval for Survey)

Cardiff Business School
Ysgol Busnes Caerdydd

14 December 2022

Dear Omar Mohammed,

Research project title: Sustainable Transport. A Behavioural Analysis Investigating the Implementation of Battery Electric Vehicles in Wales

SREC reference: 1491.

Ethical Opinion:

The School Research Ethics Committee (SREC) reviewed the above application via its proportionate review process. The Committee gave a favourable ethical opinion of the above application on the basis described in the application form, protocol and supporting documentation.

Any substantial amendments to documents previously reviewed by the Committee must be submitted to the Committee via CARBS-ResearchEthics@cardiff.ac.uk for consideration and cannot be implemented until the Committee has confirmed it is satisfied with the proposed amendments.

The Committee reminds you that it is your responsibility to conduct your research project to the highest ethical standards and to keep all ethical issues arising from your research project under regular review.

Yours sincerely,
Dr Carmela Bosangit
Chair of School Research Ethics Committee.

APPENDIX H (Invitation to Take Part in Survey - Flyers)

Are you a Battery Electric Vehicle (BEV) Owner in Wales aged 18 years old and above?

If yes, you are kindly invited to take part in this 15 minute survey.

Your participation will provide valuable information in understanding BEV Ownership in Wales

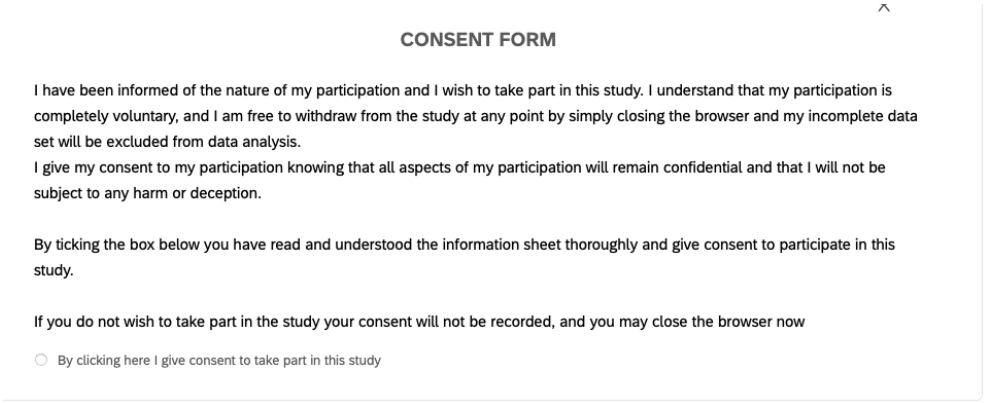
Your support is highly appreciated.

Thank you. Please email Omar Jamal (PhD researcher, Cardiff Business School, Cardiff University) at Mohammedo@cardiff.ac.uk if you wish to find more information.

Please type the link below to take part in the survey:

bit.ly/BEVOwnershipinWales

APPENDIX I (Main Survey Questionnaire)



CONSENT FORM

I have been informed of the nature of my participation and I wish to take part in this study. I understand that my participation is completely voluntary, and I am free to withdraw from the study at any point by simply closing the browser and my incomplete data set will be excluded from data analysis.
I give my consent to my participation knowing that all aspects of my participation will remain confidential and that I will not be subject to any harm or deception.

By ticking the box below you have read and understood the information sheet thoroughly and give consent to participate in this study.

If you do not wish to take part in the study your consent will not be recorded, and you may close the browser now

○ By clicking here I give consent to take part in this study

Survey Questions (28 in total)

Q1) Please respond to the following statements according to the extent to which you agree or disagree

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I feel connected to my car	○	○	○	○	○	○	○
I feel my car belongs to me, it is "mine"	○	○	○	○	○	○	○
I feel a high degree of personal ownership of my car	○	○	○	○	○	○	○
I feel I own my car	○	○	○	○	○	○	○

Q2) In relation to the **plug-in to charge technology** in your car please respond whether you agree or disagree to the following questions

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Understanding how the charging system works, makes me feel as though I am at "the cutting edge" of technology	○	○	○	○	○	○	○
Learning how to get the best output when charging my car, makes me feel more in control of my car	○	○	○	○	○	○	○
Through information learnt from various charging points, I understand more about the charging capabilities of my car	○	○	○	○	○	○	○
I am confident in handling general problems that arise when charging my car	○	○	○	○	○	○	○

Q3) In relation to using your car's **smartphone application** to interact with the car please respond whether you agree or disagree to the following questions

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Understanding how to interact with my car through the smartphone app makes me feel I am at "the cutting edge" of technology	○	○	○	○	○	○	○
After using the smartphone app to interact with my car, I feel more in control of my car	○	○	○	○	○	○	○
Through information learnt from using the smartphone app I understand more about my car	○	○	○	○	○	○	○

Q4) In relation to using the **autonomous driving features** in your car (e.g adaptive cruise control or self parking) please respond whether you agree or disagree to the following questions

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Understanding how my car operates autonomously, I feel I am at "the cutting edge" of technology	○	○	○	○	○	○	○
After using the autonomous features I feel in control of my car	○	○	○	○	○	○	○
Through information gained about how the autonomous features work, I understand how my car drives autonomously	○	○	○	○	○	○	○

Q5) The following questions relate to how you feel towards the **natural environment** you are living in

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I feel a strong sense to care for the environment around me	○	○	○	○	○	○	○
I feel a degree of personal ownership over the environment around me	○	○	○	○	○	○	○
I feel a strong sense of closeness with the environment around me	○	○	○	○	○	○	○
I would feel guilty if the car I own damages the environment e.g. produces high levels of CO2 emissions	○	○	○	○	○	○	○
I feel that protecting the environment is the right thing to do	○	○	○	○	○	○	○
I have an obligation to reduce my environmental impact to meet the needs of future generations	○	○	○	○	○	○	○
I feel a degree of responsibility for the condition of the air around me	○	○	○	○	○	○	○
Because I drive a Battery Electric Vehicle, I do not feel I am contributing or responsible for air pollution	○	○	○	○	○	○	○
I feel a degree of responsibility to minimise my environmental impact to enhance the lives of others	○	○	○	○	○	○	○
Please select Strongly Disagree for this statement	○	○	○	○	○	○	○

Q6) Please respond to the following statements according to the extent to which you agree or disagree. The following questions relate to whether you feel you are part of the **Battery Electric Vehicle owners community**

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
We (myself and other Battery Electric Vehicle owners) collectively feel we represent a wider community of eco-conscious drivers	○	○	○	○	○	○	○
We (myself and other Battery Electric Vehicle owners) collectively agree we are part of an exclusive community representing those that own a Battery Electric Vehicle owners "this community is ours"	○	○	○	○	○	○	○
We (myself and other Battery Electric Vehicle owners) feel as though we represent a group of environmentally responsible individuals	○	○	○	○	○	○	○
We (myself and other Battery Electric Vehicle owners) collectively agree we are taking positive action towards caring for "our" environment	○	○	○	○	○	○	○

Q7) Please fill in the blank space by answering to what extent you agree or disagree

Collectively myself and other Battery Electric Vehicle owners feel ..... knowing that together **we belong to an exclusive group** of drivers on the road

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Achieving	○	○	○	○	○	○	○
Confident	○	○	○	○	○	○	○
Successful	○	○	○	○	○	○	○

+ Add page break

Q41

Q8) Please fill in the blank space by answering to what extent you agree or disagree

Collectively myself and other Battery Electric Vehicle owners feel ..... knowing that **together we are using the latest technology** when it comes to driving

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Confident	○	○	○	○	○	○	○
Productive	○	○	○	○	○	○	○
Successful	○	○	○	○	○	○	○

Q9) Please fill in the blank space by answering to what extent you agree or disagree

Collectively myself and other Battery Electric Vehicle owners feel ..... knowing that together **we are encouraging those around us** to be more environmentally responsible

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Achieving	○	○	○	○	○	○	○
Confident	○	○	○	○	○	○	○
Successful	○	○	○	○	○	○	○

Q10) Please respond to the following statements according to the extent to which you agree or disagree. The following questions relate to the potential overlap between your identity and your car

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
My car helps me achieve the identity I wish to have	○	○	○	○	○	○	○
My car helps narrow the gap between who I am and who I try to be	○	○	○	○	○	○	○
There is an overlap between the technology features of my car and my identity (they both signal being tech savvy)	○	○	○	○	○	○	○
There is an overlap between the environmental benefits of my car and my identity (they both signal being environmentally responsible)	○	○	○	○	○	○	○

Q11) Please respond to the following statements according to the extent to which you agree or disagree

Having access to and interacting with various technology features in my car I feel ..... about myself

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Accomplished	○	○	○	○	○	○	○
Successful	○	○	○	○	○	○	○
Achieving	○	○	○	○	○	○	○
Confident	○	○	○	○	○	○	○

Q12) Please respond to the following statements according to the extent to which you agree or disagree

Having access to and interacting with various technology features in my car I sometimes feel.....over those who **do not own a BEV**

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Stuck-up	○	○	○	○	○	○	○
Egotistical	○	○	○	○	○	○	○
Smug	○	○	○	○	○	○	○

Q13) Please respond to the following statements according to the extent to which you agree or disagree

Thinking about yourself and owning a Battery Electric Vehicle how do you feel about your impact on the environment

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I feel proud knowing my car symbolises I have taken action to reduce my environmental impact	○	○	○	○	○	○	○
I feel proud that my car **does not** cause a negative environmental impact to the people around me	○	○	○	○	○	○	○
When I drive my car, I feel proud about myself when I see others on the road driving petrol or diesel cars	○	○	○	○	○	○	○

Q47

Q14) Knowing that my car **does not** emit CO2 I sometimes feel.....over those who do not own a Battery Electric Vehicle

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Egotistical	○	○	○	○	○	○	○
Smug	○	○	○	○	○	○	○
Please select Strongly Agree for this statement	○	○	○	○	○	○	○

Q15) Please respond to the following statements according to the extent to which you agree or disagree

The following questions relate to you advocating Battery Electric Vehicles to others

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I would recommend a Battery Electric Vehicle to those who do not yet own one	○	○	○	○	○	○	○
I would say positive things about owning a Battery Electric Vehicle to those who do not yet own one	○	○	○	○	○	○	○
I would spread the word about owning Battery Electric Vehicle to those who do not yet own one	○	○	○	○	○	○	○

Q16) Please respond to the following statements according to the extent to which you agree or disagree

The following questions relate to your overall satisfaction with owning a Battery Electric Vehicle

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I enjoy driving a Battery Electric Vehicle	○	○	○	○	○	○	○
My car meets or exceeds my expectations of Battery Electric Vehicles	○	○	○	○	○	○	○
Overall I am satisfied with my Battery Electric Vehicle	○	○	○	○	○	○	○

Q54

Q17) What is your age group?

- ○ 18-21
- ○ 22-30
- ○ 31-40
- ○ 41-50
- ○ 51-66
- ○ 66+
- ○ Prefer not to say

Q55

Q18) What best describes your gender?

- ○ Female
- ○ Male
- ○ Non-binary
- ○ Prefer to self describe
- ○ Other
- ○ Prefer not to say

Q19) What is your current occupation status?

- Employed
- Self-employed
- Retired
- Student
- Housewife/husband
- Volunteer
- Unemployed
- Other
- Prefer not to say

Q20) Which of the following best describes your highest educational attainment?

- Primary Education
- Secondary Education
- A-levels/ College
- Higher Education (Bachelor's Degree)
- Postgraduate Education (e.g. Masters, PhD)
- Prefer not to say

6. Household Income

Q21) What is your approximate household income before tax (Gross) annually?

- Less than £10K
- £10K - £20K
- £21K - £30K
- £31K - £40K
- £41K - £50K
- £51K - £60K
- £61K - £70K
- £71K - £80K
- £81K - £90K
- £100K +
- Prefer not to disclose

Q22 What region in Wales are you currently living in?

Click here to edit choices

Q23) What is the brand of the Battery Electric Vehicle you currently drive now?

Please select from the following options:

Ford	Mercedes	Kia
Toyota	Vauxhall	3
Honda	Audi	Skoda
Hyundai	Jaguar	Cupra
Tesla	Nissan	Fiat
Volkswagen	Renault	Peugeot
Polestar	Volvo	Other
BMW	Mini	

Miles / Week *

Q24) Roughly how many miles each week do you drive in your Battery Electric Vehicle?

- 0 - 50 miles
- 51 - 100 miles
- 101 - 150 miles
- 151 - 200 miles
- 201 - 250 miles
- 251 - 300 miles
- 300+ miles

Q25) When charging your car what charging speeds (kW) do you most frequently use?

- 3 - 7 kW (Slow Charger)
- 8 - 22 kW (Fast Charger)
- 23 - 50 kW (Rapid Charger)
- 50 kW + (Ultra Rapid)

Page Break

*

Q26) Approximately how long have you been a driver of a Battery Electric Vehicle (including any previous Battery Electric Vehicles owned)

- Under 6 months
- 6 months - 1 year
- Between 1 - 2 years
- Between 2 - 3 years
- Between 3 - 4 years
- 4 years +

9. Car Ownership *

Q27) What form of car ownership best describes you?

- My car was bought outright
- My car is part of a long-term lease agreement
- My car is a company car
- I currently car share with a family or friend
- The car I drive is part of a car sharing club (e.g. ZipCar)

Thank you for taking part in this study survey this will greatly benefit the research project and help in designing and coordinating a better future for EV drivers.

To record your response please click on the BLUE ARROW BELOW

If you would like further information about this survey or about the research project please do not hesitate to contact the researcher (myself):

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APPENDIX J (BEV Brand Classification)

Car Brand Classification – According to Brand Finance 2023	
Brand Classification	Car Brand
Luxury	Tesla, Audi, Porsche, Polestar, Jaguar, Mercades, BMW
Premium	Volkswagen, Cupra, Ford, Lexus
Mainstream	Mini, Hyundai, MG, Kia, Renault, Honda, Nissan