Sustainability and Motorsport: An Examination of Formula E.

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I declare that the main text of this dissertation is no more than 10919 words, and is all my own work.

Signed:……..

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Abstract

The FIA Formula E Championship started in 2014 and is the world's first fully electric international motor racing series. This study used a quantitative and qualitative survey, distributed at Oulton Park, Donington Park and through relevant social media outlets, to assess what type of supporter Formula E (FE) attracts, whether they think FE can implement their sustainability and Electric Vehicle (EV) expansion aims, and assessing whether external factors influence attitudes towards FE and its sustainability.

This study demonstrates that most of the sample FE supporters engage with other motorsport disciplines and cannot be treated as an isolated group. The study found that independent variables such as respondent age, nationality, level of sustainability concern and intensity of FE support can impact the sample population attitudes towards EVs, FE and sustainability.

Despite an overall positive and optimistic attitude, a large proportion of the sample population was not convinced by FE's sustainability and EV expansion aims, often citing underdeveloped technology, high EV purchase prices and charging infrastructure issues as reasons. However, the majority of the sample population did agree that if FE could develop EV technology their opinions towards EVs would improve. These findings imply that FE has the potential to increase EV development and market expansion by improving the technical aspects and public image associated with EVs.

Table of Contents

Table of Figures

Table of Tables

1. Introduction

1.1 Background information

The FIA Formula E championship value creation and sustainability report 2013 (EY 2013) outlined Formula E's (FE) sustainability and the Electric Vehicle (EV) expansion aims. FE plans to inspire supporters into more sustainable habits of life and mobility; going against the traditional notions that motorsport supporters behave unsustainably (Allen 2014). FE's approach to motorsport is revolutionary, attempting to inspire change within its supporter community through better fan engagement and improving EV technology and image. This dissertation assesses how successful FEs sustainability and EV expansion aims could be.

1.2 Rationale

Research into public sustainability attitudes is extensive, from large-scale international surveys (e.g. Leiserowitz *et al* 2005) to local consumer studies (e.g. Caird *et al* 2008). However, despite the motor racing industry developing alongside the domestic car and providing persuasive marketing for a variety of vehicles (Featherstone 2014), motorsport supporter attitudes towards sustainability have largely been overlooked. With the introduction of FE motorsport supporter attitudes towards sustainability are more important than ever, as FE provides the best opportunity to create a sustainable motorsport template.

Unfortunately motorsport by its definition is classically unsustainable, the upkeep and running of Internal Combustion Vehicles (ICVs) require natural resources (Dingle 2009), and according to Allen 2014 this can heavily influence supporter behavior. It has been a recent trend of motorsport to appear more sustainable, with the FIA (governing body for world motorsport, including F1 and FE) claiming that creating sustainable mobility "requires working with authorities…stake holders…implementing affordable transport solutions, embracing and deploying new technology" and "educating customers in behavioral change" (FIA).

FE has attracted major commercial, racing and EV manufacturers, and as of season two (2015-2016) became an 'open' series, allowing teams/manufactures to develop their own electric motor technology. To make the first season more affordable and attractive, all teams used the Spark-Renault SRT_01E car, "ensuring a balance between cost effectiveness and sustainability" (FIA Formula E Championship[1]).

As of season two, the teams/manufacturers involved in FE included:

- ABT Schaeffler Audi Sport: ABT have experience in DTM and endurance racing and Audi Sport offer technical support (FIA Formula E Championship[2]).
- Andretti Formula E Team: Andretti have a long heritage in the USA IndyCar Series, USF2000 Championship, the VW Global Rally Cross, the Pro Mazda Championship and the Indianapolis 500 (FIA Formula E Championship[3]).
- Dragon Racing: Dragon Racing have experience in the USA IndyCar Series (FIA Formula E Championship[4]), claiming that FE provides the framework for future motorsport, centering around the three core values of "Energy, Environment and Entertainment", fusing "engineering, technology, sport, science, design, music and entertainment" to promote EVs (Dragon Racing).
- DS Virgin Racing Formula E Team: Virgin promotes EV technology innovation for commercial use, and Citroën DS is a technical partner (FIA Formula E Championship[5]). The team insists that due to the environmental and health impacts associated with ICVs, EVs are the only viable future option, and that FE accelerates EV development (DS Virgin Racing Formula E Team).
- Mahindra Racing Formula E Team: Mahindra Reva Company is an international producer of commercial EVs, having experience in the FIM Moto GP World Motorcycle Racing Championship (FIA Formula E Championship[6]).
- NEXTEV TCR Formula E Team: NEXTEV has experience competing in the A1GP Championship, WTCC, FIA GT and Superleague Formula (FIA

Formula E Championship[7]). The team aims to develop sustainable EV technology and public support in China (NEXTEV TCR Formula E Team).

- Renault e.dams: Renault has vast experience in F1, was the main technical founding partner for FE and is keen to create technical links to road vehicles (FIA Formula E Championship[8]).
- Team Aguri: Team Aguri have experience in F1, believing that the knowledge gathered in FE is the key for creating sustainable transport solutions (FIA Formula E Championship[9]).
- Venturi Formula E Team: Venturi Automobiles are world leaders in high performance EV technology, holding the current official EV world land speed record (FIA Formula E Championship[10]).

Individual FE teams, companies and sponsors have their own objectives; some have extensive racing experience while others are technical innovators. However, most of these objectives are concerned with sustainability and are dependent on the public accepting new technology and behavioral changes.

1.3 Research aims

The aims for this research are to establish:

- What sustainability claims FE is making, and how these will be implemented?
- What do motorsport supporters think of FE?
- Does FE attract a different type of motorsport supporter, or engage with the existing motorsport community?
- What impact could FE have on creating affordable and realistic alternative commercial transport technologies?
- Do external factors (e.g. age, nationality, level of sustainability concern and FE support) influence supporter engagement with FE?

1.4 Dissertation layout

- Literature review: This section outlines FEs sustainability aims, giving a definition of 'sustainability' and its implementation. It shows some of the existing public attitudes towards sustainability, outlining how sustainability relates to the motor sport and the FE community, highlighting the gaps in sustainability research.
- Method: This section outlines the study survey design, showing the reasoning behind question choices, providing information on the survey distribution techniques, and outlining the methods used for data analysis.
- Results: This section displays the basic survey results.
- Analysis: This section shows the simplified categories used to facilitate quantitate statistical analysis, displaying the Chi-Square test for association results.
- Discussion: This section addresses the research aims, using the survey and statistical analysis information to identify the type of supporter FE attracts and their opinions towards FE, what impacts they believe FE can have on sustainability and the wider EV market, and whether external factors influence the populations attitudes.
- Conclusion: This section outlines the final research observations, possible improvements, and highlights areas for future study.

2. Literature review

This literature review first outlines FEs sustainability aims. It then outlines the existing definitions of sustainability, demonstrating some sustainability implementation methods and highlighting inconsistences within these areas. The next section attempts to show the existing public attitudes towards sustainability. Finally, the literature review outlines how sustainability relates to motorsport and its supporter community.

2.1 Formula E's sustainability aims

The EY *FIA Formula E Championship Value Creation and Sustainability Report 2013* outlines FE's expectations for sustainable development over the next 25 years, claiming that FE will promote co-operation between "all levels of Government, Automotive and Energy industries, Universities and Research institutions, Private charities and NGO's" to create a sustainable future (EY 2013 p3). EY 2013 evaluated the potential worth of FE by assessing its ability to remove 'barriers to the EV market', forecasting the following:

"EV market penetration:

Forecasted 17% sales market share by 2040 under current conditions

↓

Current Barriers to the EV Market:

1) Pricing
2) Technological progress
3) Social awareness and responsiveness
4) Infrastructure
5) Regulations

↓

Green Acceleration Factor (GAF):

Impact of Formula E strategy/actions on current market barriers

↓

Accelerated EV market penetration = increase in sale of EV's

↓

Local and global impact in green growth"

(EY 2013 p2)

EY 2013 say that under its current projection, FEs direct influence over 'green growth' across the next 25 years could include "€142bn extra world wide sales generated in the car industry, 52-77m additional electric vehicles sold around the world" and "42,000 permanent jobs created in the car industries worldwide" (EY 2013 p4). EY 2013 claim FEs potential environmental impact over the next 25 years includes avoiding "900million tonnes of CO_2…€13.9billion saved in CO_2 costs" and "4billion oil barrels saved" (EY 2013 p5). Finally, EY 2013 claim that the potential social improvements of FE over the next 25 years include a "$10million average total visitor spend during each Formula E race event", and "€25billion saved on healthcare costs and productivity from pollution reduction and significant quality of life improvement in cities" (EY 2013 p6).

FE intends to use racing as a platform for improving EV technology, charging infrastructure, co-operation between industry and legislators, and making EVs a more viable option for personal mobility.

2.2 Definition of sustainability

Adoption of sustainability on global, government, business, community and individual levels are important to ensure future resource security while providing a good quality of life today.

Robertson 2014 claims that a simple way of defining sustainability is the "triple bottom line", or, the 3Es (Economics, Environment and Equity), claiming it is impossible to tackle the 3Es individually as they are fundamentally intertwined. Addressing the environmental pillar requires human's repositioning ourselves into a more sustainable position in the worlds ecological system (Robertson 2014). Addressing the economic pillar requires a more even distribution of resources and major changes to the worlds economic systems, and addressing the equity pillar requires closing global inequality gaps (Robertson 2014). However, the triple bottom line fails to acknowledge that the environmental pillar should take priority, as with its degradation comes the failure of social and economic systems (Farley and Smith 2013).

The concept of sustainability is difficult to define, providing different meanings depending on interpretation (Farley and Smith 2013). For example, economists claim that sustainable development should "sustain economic growth indefinitely", while environmental groups claim that little real sustainability has been achieved, with the only consensus being that sustainability needs global scale consideration (Phillis and Kouikoglou 2009).

The United Nations World Commission for Environment and Development "Our Common Future"/Brundtland report was the first international attempt to define sustainability, stating that sustainable development only works if it "meets the needs of the present without compromising the ability of future generations" (Dresner 2008 p2). By the 1992 Rio de Janeiro UNCED conference most member states had accepted the concept of sustainable development, however some put emphasis on long-term economic growth and others on environmental protection, compromising action plan agreement (Dresner 2008). At the 1992 Rio Earth Summit businesses were challenged to provide their perspective on sustainability, with many siting significant cost savings associated with sustainable practices (Farley and Smith 2013).

Sustainability aims to shift from the earths 'natural capital' (e.g. oil) to 'human capital' (e.g. renewable energy) (Dresner 2008). However, practicality issues include decreasing global oil dependency and accepting that there may be some 'critical natural capital' that must be preserved (Dresner 2008).

Despite sustainability being a relatively new a concept, 'ecological modernization' could be a more appropriate sustainable discourse for the 21st century. Ecological modernization claims that although science and technology contributed to unsustainable practices it can also provide the solutions, that the free economic markets and consumers/customers have an increasing role in environmental reform, there is a decreasing traditional statutory role of the government and the neglect of environmental issues by businesses has become unacceptable (Mol 2000).

Hajer 1995 claims that under ecological modernization environmental damage is seen as a potential risk to industry profits, with firms suffering from customer boycotting and investor downturn if they are seen to be unsustainable.

Ecological modernization has risen to prominence because it is more easily agreeable with broader political-economical factors than traditional sustainability discourses (Buttel 2000).

It appears that FE is a major adopter of ecological modernization, using technology, consumerism and economic markets to drive sustainability changes in motorsport and personal mobility.

The triple bottom line/3Es provides the most universally accepted sustainability definition. However, disagreements over what sustainability pillar takes priority, what sustainability actually means, and whether ecological modernization is a more appropriate sustainable discourse make creating effective and large-scale policies difficult.

2.3 Methods of implementing sustainability initiatives

Robertson 2014 suggests that sustainability initiatives should involve people via top down and bottom up approaches, requiring strong leadership and champions that will influence others into sustainable behavior. FE has a similar approach, using the series as a champion of sustainable technology. Robertson 2014 claims that top down initiatives take affect faster while bottom up schemes create longer lasting policies, with Ball and Helbing 2012 agreeing that bottom up approaches often achieve more sustainable outcomes. However, FE has a majority top down approach, hoping that the technology and sustainability examples pioneered in FE will penetrate everyday behavior.

Phillis and Kouikoglou 2009 suggest that organizations/companies either employ sustainable technology/initiatives that address their long-term future, or, pursue short term and often-unsustainable practices for immediate profits. FE has already predicted a range of possible future scenarios over the next 25 years, attempting to address their long-term sustainability impacts, acting as "a catalyst for change" via "technological innovations, social awareness and infrastructure development" (EY 2013 p1).

Mullingan 2015 claims that alternative low-carbon technologies will have to be entertained to achieve real sustainability, with a common belief that climate change can be mitigated by technology, the responsibility for

implementing changes lies with experts, and that the 3E's must be adhered to for an initiative to work.

However, Robertson 2014 suggests that to achieve sustainability there needs to be full international co-operation, claiming that sustainability solutions are cumulative. Although the public believes that sustainability can be achieved through technological innovation, and the responsibility for implementing change lies with experts, sustainability relies on unilateral action at all levels. Technological innovation alone is not enough to achieve sustainability, and major environmental/behavioral changes are required (Farley and Smith 2013).

The Foresight: Intelligent Infrastructure Systems (IIS) project outlines 2 broad ways public transport behavior can be improved (Government Office for Science and Technology 2006). Firstly, public behavioral changes can be achieved by providing useful and easily accessible information on alternative modes of transport and the most economical routes. Secondly, change can be forced by ensuring travelers pay the full economic, social and environmental cost for each journey (e.g. 'Carbon allowance') (Government Office for Science and Technology 2006).

The Earth Summit in Rio de Janeiro 1992 first outlined that it is the responsibility of local governments to educate and mobilize the public on sustainability, then at the World Summit on Sustainable Development in Johannesburg 2002 the needed to focus on poverty, the environment and natural resources to achieve sustainability was identified, requiring changes to consumption and production patterns (Parkin 2012). Public behavioral changes are required to achieve sustainability, but viable low carbon technologies need developing to replace existing ones and to prevent global economic collapse.

With decreasing fossil fuel reserves comes an increasing risk of economic crisis, and currently fossil fuels are vital for global economies (Cabezas and Diwekar 2012). Cabezas and Diwekar 2012 suggest that economic growth has always increased in parallel with the production of fossil fuels, creating challenges to integrate carbon neutral technology while maintaining a strong economy. Robertson 2014 also suggests that, due to fossil fuel dependency, it's not possible to abruptly switch to carbon neutral technologies without total economic collapse, and a realistic transition could take decades.

Frame works for a carbon neutral transition include the development of new sciences, technologies and helping businesses adapt to new operating procedures (Gorman *et al* 2012). FE is a leader in fossil fuel free business, having committed to the RE100 scheme to become 100% renewable (FIA Formula E Championship[11]). However, FE have already identified that its sustainability and EV expansion aims will take decades to implement, with a projected slow transition away from fossil fuels.

Changing the existing mobility system is challenging, with ICVs becoming 'locked in' as the predominate mode of transport in the 20th century (Urry 2005). To make EVs a viable future option, an integrated system similar to the existing ICV one needs rapid development.

According to Urry 2005, to replace our current fossil fuel based system not only will low carbon technology need developing, but the de-privatization of vehicles and changes from 'predict-and-provide' transport policies to those aimed at reducing demand are also required. Although FE is attempting to inspire automobile system changes, the de-privatization of cars directly contradicts FEs EV expansion aims, raising questions over if FE will actually influence sustainable mobility system changes.

There is extensive economic, political, social and technological interest in ensuring that fossil fuel mobility remains dominant (Dennis and Urry 2009), with every category of motorsport other than FE being dependent on fossil fuels. If FE wants to achieve its sustainability and EV expansion aims it will have to overcome social, infrastructure, political and technological barriers.

Although FE has a strong sustainability strategy, they will also face competition from other low carbon technologies. Dennis and Urry 2009 claim the low carbon technology that will provide the basis for personal transport over the next century will be decided within a few decades, and there is no clear leader for this position. Not only will FE have to compete with ICVs, but it will also have to prove that EVs are the most viable low carbon technology.

Organizations can either pursue shot term profits or long-term sustainability, and for sustainability to be properly implemented public attitude changes and unilateral co-operation is vital. However, the existing fossil fuel system is resistant to change, and many of the public behavioral changes

required to achieve sustainability are incompatible with FEs aims. Despite this, FEs sustainability initiatives do provide a potential fossil fuel alternative that can also sustain economic activity.

2.4 Public attitudes towards sustainability

Brand 2010 argues that high public interest means that "global environmental problems have been and continue to be at the top of global political agenda" (Brand 2010 p135), suggesting that the public are more interested in sustainability than ever before. Leiserowitz *et al* 2005 also claim that global public support for sustainability is quite high, with people often valuing the environment above economics and many claiming that they would pay increased taxes to ensure its security.

However, Leiserowitz *et al* 2005 go on to claim that in a 2002 survey of 20 developed countries only 36% of respondents avoided a product on environmental grounds, 6/10 people claimed to recycle and answers were riddled with contradictions (Leiserowitz *et al* 2005). Leiserowitz *et al* 2006 also suggest that "most advocates for sustainable development recognize the need for changes in human values" (Leiserowitz *et al* 2006 p414), and positive attitudes towards sustainability doesn't always inspire sustainable action. Leiserowitz *et al* 2006 claim that global attitudes towards consumption are complicated, with both a global feeling that consumption values need changing and a public enjoyment of consumerism.

Leiserowitz *et al* 2006 highlight there are positive global attitudes towards science and technology, with many believing technology is the key to achieving sustainability, and although some global sustainability attitude generalizations can be taken, there are national differences.

Pursell 2008 also claims that modern society believes technology will fix threat of climate change, and technologies that challenge the established economical and political systems are least lightly to be accepted, being to expensive and inconvenient. For FE to influence the expansion of EVs they will have to overcome established industry barriers (e.g. technological limitations, vehicle purchase cost) and make EVs an attractive alternative for the public.

According to Farley and Smith 2013 the American public are attempting to address what they consider sustainability to by purchasing efficient household appliances and hybrid vehicles. However, Farley and Smith 2013 also highlighted that despite these efforts the USA is still one of the least sustainable developed countries in the world, with a great misunderstanding about what sustainability actually is. Cotton and Alcock 2013 highlight that "environmental sustainability is the most frequently identified of the three pillars of sustainability" (Cotton and Alcock 2013 p1457), and a public misunderstanding of the wider sustainability area creates uncertainty over if the public attitudes towards sustainability are accurate.

Sustainability has become popular among the media and politicians as an affective way of phasing 'environmentalism' to the general public (Dresner 2008). However, the UKERC 2012 suggests that although the UK supported renewable energy, "politicians, scientists and the media are causing people to switch off" (UKERC 2012 p4), and as a consequence sustainability has started taking a lower public priority.

The British Social Attitudes Survey 2014: Public attitudes towards transport found that "75% of respondents showed willingness to buy a car with lower CO_2 emissions" (DfT 2014 p14). However, the DfT 2014 also claimed that there is a clear "gap between what people think should happen and what…they are prepared to do" (DfT 2014 p18), suggesting that the public may admire EV technology in theory, but would be unwilling to purchase them. The UK has the potential to be a significant EV consumer market, but public uncertainty about sustainability and EV technology has the potential to hinder this expansion.

Although FE is open to support from all demographics of the public, it has the specific aim of attracting a younger and more environmentally conscious audience (Schuttle 2016). Caird *et al* 2008 conducted a survey of environmentally conscious consumers in the UK, concluding that they adopted green measures "to save energy, money and/or the environment" (Caird *et al* 2008 p149), sometimes rejecting green measures because of price barriers and technological issues. If FE wants to influence their environmentally conscious supporters into purchasing EVs they need to present economical and environmental incentives.

There are general positive public attitudes towards sustainability and carbon neutral technology, but research studies into public sustainability attitudes are contradictory and create uncertainty. There may also be confusion among the public regarding what 'sustainability' actually is, with many becoming disengaged by politicians and scientists.

2.5 Motorsport sustainability and gaps in the research

In 2005 motorsport was worth £50billion and 0.23% of the worlds GDP, with all categories sharing the common themes of technological competition and a dependence on non-renewable resources, potentially influencing supporters into unsustainable behavior (Dingle 2009).

However, Williams 2015 claims that the only reason FE exists is because at least some of the motorsport community has realized they are not sustainable. FE has been divisive within the motor racing community, some claim its just a refuge for F1 rejects in identical cars, while others say it's the only viable motorsport future (Williams 2015).

Dingle 2009 suggests that recently motor sport has started to recognize sustainability, driven by the manufactures desire to create more efficient vehicles and improve the motor racing public image. However, Dingle 2009 concludes that, even though recent motorsport sustainability efforts have been made, the supporters are still stuck in unsustainable ways.

However, Allen 2014 claims "the FIA recognized some time ago that if it did not address sustainability and regulate to improve its own profile, then outside forces might come in and force regulation on it". Despite this, Allen 2014 also says that motorsport sustainability initiatives are tough to accept by a large amount of F1 supporters, who are skeptical of 'Green washing'. 'Green Washing' is often associated with businesses marketing products as sustainable to make them more attractive to environmentally conscious consumers, when in reality minimally efficient practices are employed (Farley and Smith 2013).

The general opinion is that motorsport supporters are influenced to act in unsustainable ways and are skeptical to change. However, very little research has been conducted into motorsports influence on supporters, especially regarding sustainability. It is uncertain if FE could inspire existing motorsport

supporters into more sustainable behavior, whether existing motorsport supporters already consider themselves to be sustainable, or if FE could generate support from new groups.

3. Methodology

The method section first outlines the survey question design, providing reasons behind question choices. This section then demonstrates the methods of survey distribution and data analysis.

3.1 Survey question design

In total two pilot surveys and one final survey were produced, and although design remained similar throughout, certain questions were adapted depending on pilot survey feedback.

3.1.1 Pilot survey 1

Pilot survey 1 (**Appendix 1**) was produced to test the initial question design, distribution method, ease of result analysis and overall competence of research.

The opening survey paragraph explains who is conducting the research, the reason why, and details on the £10 Amazon Voucher prize draw.

Question 1 asked a closed, multiple-choice question of age. An age range assists with analysis, enabling groups to be categorized together while protecting against respondent embarrassment; Flowerdew and Martin 2005 suggest that potentially embarrassing questions should be avoided where possible.

Question 2 was a closed, multiple-choice question regarding gender, helping to identify what type of supporter FE attracts.

Question 3 asked for an optional e-mail address, only applicable to those who wanted to enter the prize draw.

Question 4 asked an open question regarding personal occupation. However, pilot survey 1 found that this question lead to unanalyzable responses and was removed from pilot survey 2.

Question 5 asked an optional, open question regarding nationality. This question was optional in pilot survey 1 to identify if respondents were confortable sharing this information. Results found that respondents were

comfortable giving their nationality; with a variety of countries being represented.

Question 6 asked a closed, multiple-choice question over if the respondents would consider purchasing an EV, placed before the motorsport and FE questions to avoid respondent bias. Question 6 has an impartial response option for those with neutral feelings towards EV's, avoiding forced opinions and 'patterned responses' (Flowerdew and Martin 2005). Neutral options are included in all the closed, multiple-choice, scale and lichert scale questions.

Question 7 asked an optional, open question over why the respondent's would/would not purchase and EV. Question 7 gives the respondents an opportunity to express the reasons behind their Question 6 response, collecting qualitative information.

Question 8 employed a lichert scale to assess the respondents concern over environmental sustainability. The lichert scale is a compromise between restrictive closed questions and open less quantifiable ones, allowing an expression of opinion whilst yielding quantifiable information.

Question 9 asked a closed, multiple-choice question over if the respondent's followed/engaged with any other motorsport categories outside of FE. Due to the vast amount of global motor racing categories an open question would be unanalyzable, so various multiple choices that cover most major car racing disciplines were created.

Question 10 asked a closed, multiple-choice question over if the respondents believe the motor racing industry is/or could be sustainable at present. Whether the motor racing industry is actually sustainable or not is of no significance for this question, only what the supporters believe.

Question 11 asks a closed, multiple-choice question over if motorsport influences the respondent's personal choice of vehicle.

Question 12 asked an optional, open question over why the respondent is/isn't influenced by motorsport for their personal vehicle. However, due to a lack of responses and useful information this question was removed after pilot survey 1.

Question 13 asked a closed, scale question over how intensely the respondents follow FE, allowing grouping based on intensity of support.

Although open to individual interpretation, a closed, scale question is the best compromise between opinion and analyzability.

Question 14 asks an optional, open question of what the respondent's general impressions of FE are. This is relatively unstructured, assessing if respondents automatically associated sustainability with FE.

Question 15 presents the respondents with a statement of FEs major sustainability and EV expansion aims from the EY 2013 report, asking them an open question of what they think of these aims.

Question 16 probes the EY 2013 statement further by asking the respondents a closed, scale question over if they agree that the FE aims are achievable.

Question 17 asks a closed, multiple-choice question over if the respondents believe there is a market for a fully electric racing series, assessing whether supporters believe that FE has a viable future in motor racing.

Question 18 asked a closed, multiple-choice question over if the respondents would purchase an EV as they are today. This is to assess whether FE supporters would invest in current EV technology, or if they believe more development is required.

Question 19 asked an optional, open question over why the respondent's would/wouldn't purchase an EV as they are today.

Question 20 asked a closed, multiple-choice question over if FE could bring changes to EV technology, would the respondent's opinions on EVs change. This question assesses if FEs aim of driving EV expansion through technological improvements is achievable.

Question 21 asked a closed, multiple-choice question over if the respondents are aware of the teams or manufacturers involved in FE. This assesses the effectiveness of FE at leaving a public impression.

Question 22 asked an open, optional question over if the respondents could name the teams or manufacturers involved in FE, assessing if different teams within FE can have differing impacts on supporters.

Finally pilot survey 1 ends with a disclaimer, the researcher contact details and information regarding the £10 Amazon Voucher prize draw.

3.1.2 Pilot survey 2

Some of the questions were revised for pilot survey 2 (**Appendix 2**), identifying if a different type of survey would collect more representative information. The question changes for pilot survey 2 are outlined below:

- The question regarding age was removed (Question 1).
- The question regarding personal occupation was removed (Question 4)
- The question of nationality was altered from optional to compulsory (Question 5).
- The question regarding why the respondent is/isn't influenced by FE was removed (Question 12)

Everything else from pilot survey 1 remained in pilot survey 2.

3.1.3 Final survey

The only change from pilot survey 2 for the final survey (**Appendix 3**) was the reintroduction of the question regarding age, as this information was deemed important for analysis.

3.2 Data collection/sampling

3.2.1 Pilot survey 1

Pilot survey 1 was created on esurv.org (after being checked for the proper data protection security) and was sampled exclusively on the Internet, collecting 20 respondents, enough to test the effectiveness of a pilot survey (Flowerdew and Martin 2005).

The Official Formula E Sustainability Manager granted permission to post pilot survey 1 on their social media (Facebook) page (20/05/15). Pilot survey 1 was also launched on the social media platform Reddit (/r/formula e, and, /r/motorsport 20/05/15).

3.2.2 Pilot survey 2

After reviewing the effectiveness of the pilot survey 1 and taking external advice, pilot survey 2 was created on Google Forms.

Pilot survey 2 was distributed in Internet and physical formats. The 'Formula E Addicts' Facebook support group gave permission to post pilot survey 2 on their page (22/05/15); pilot survey 2 was also posted on Reddit (/r/formulae, and, /r/motorsports 03/06/15). Finally, pilot survey 2 was distributed at Donington Park (MGCC Sports and Saloon Car event 02/06/15). All respondents were approached in the same way and at random, creating a consistent and controlled variable (Flowerdew and Martin 2005).

In total pilot survey 2 collected 27 respondents and distribution, response and analysis methods were deemed suitable for the final survey.

3.2.3 Final survey

The Final survey was launched in physical format at Oulton Park (BTCC Event 07/06/15), yielding 10 responses, and at Donington park (Official Formula E Pre-season testing 25/08/15), yielding 24 responses. Finally, the Final survey was distributed at Donington Park once more (British GT & Formula 4 Championship 13/09/15), gathering 15 responses.

The Final survey was also distributed on Reddit (/r/formulae, /r/formula1, and, /r/motorsport 05/06/15), gathering 43 responses.

The Final survey yielded 92 respondents in total, over the minimum 50 responses to consider a study statistically viable (Flowerdew and Martin 2005).

The Final Survey raw quantitative (**Appendix 4**) and qualitative results (**Appendix 5**) are attached as appendixes.

3.3 Survey analysis method

The quantitative results were initially analyzed individually to draw basic conclusions. The individual quantitative results were then placed together into cross-tabular tables (**Appendix 6**). These tables were then simplified to facilitate the use of the Chi-Square test for association (Minitab 17) between results. Chi-Square tests if two variables are independent from one another (Schumacker and Tomek 2012) and was adopted to ascertain if age, nationality, sustainability concern and intensity of FE support affects other variables.

The qualitative results were analyzed using coding and categorization. The categories were created from the material collected, not existing theories,

making them more relevant to the research (Flick 2007), attempting to draw generalizations.

4. Results

This section first displays the basic quantitative results, then it shows the qualitative results in their respective codified categories.

4.1 Basic quantitative results

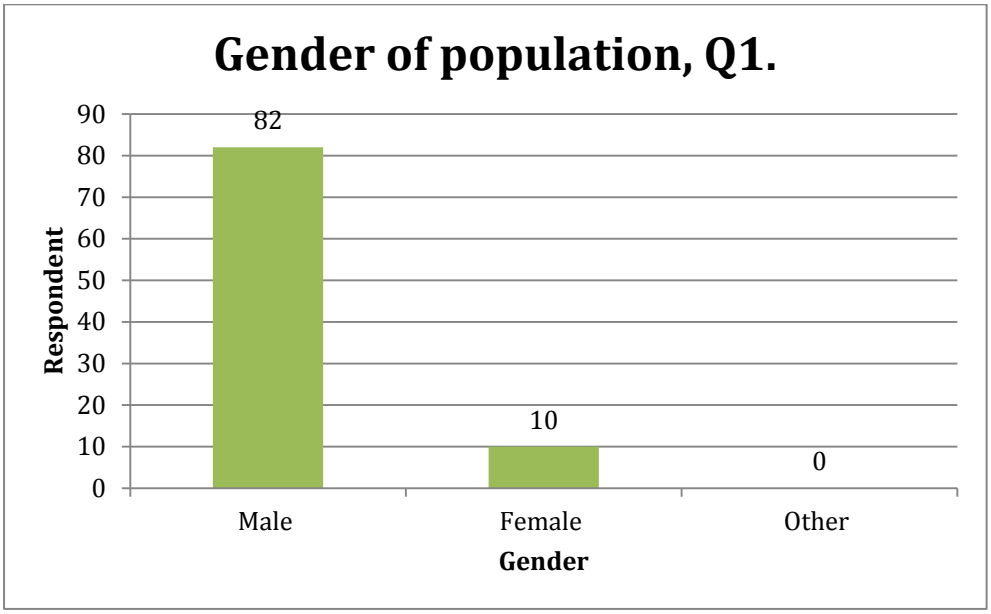

Figure 1: The population gender results.

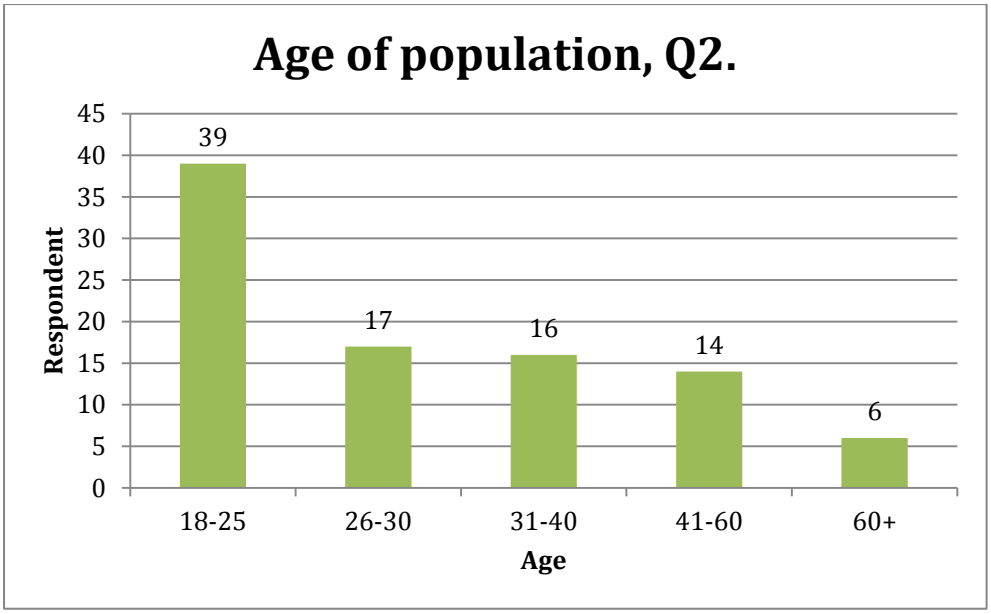

Figure 2: The population age results.

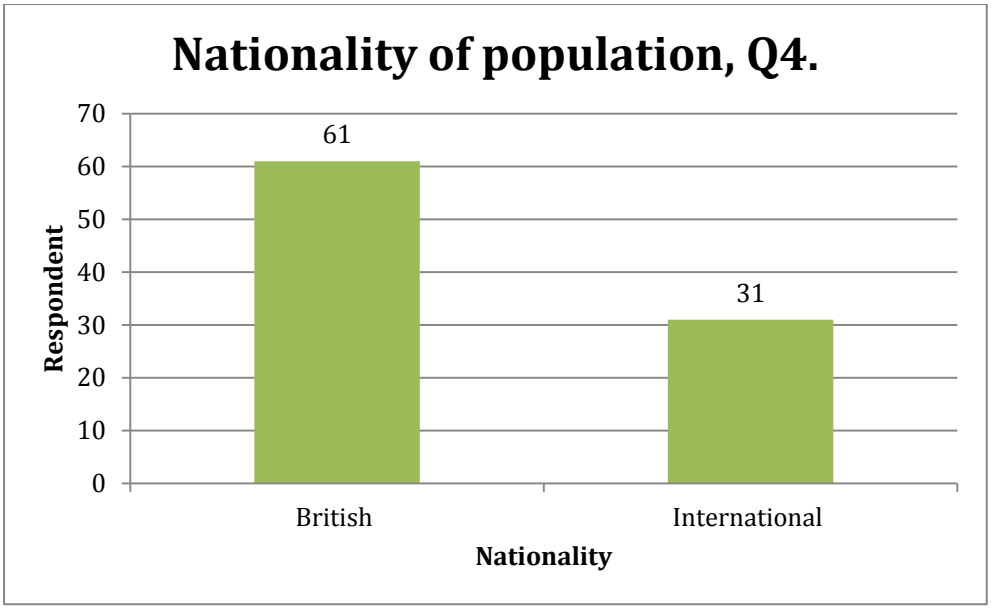

Figure 3: The population nationality results.

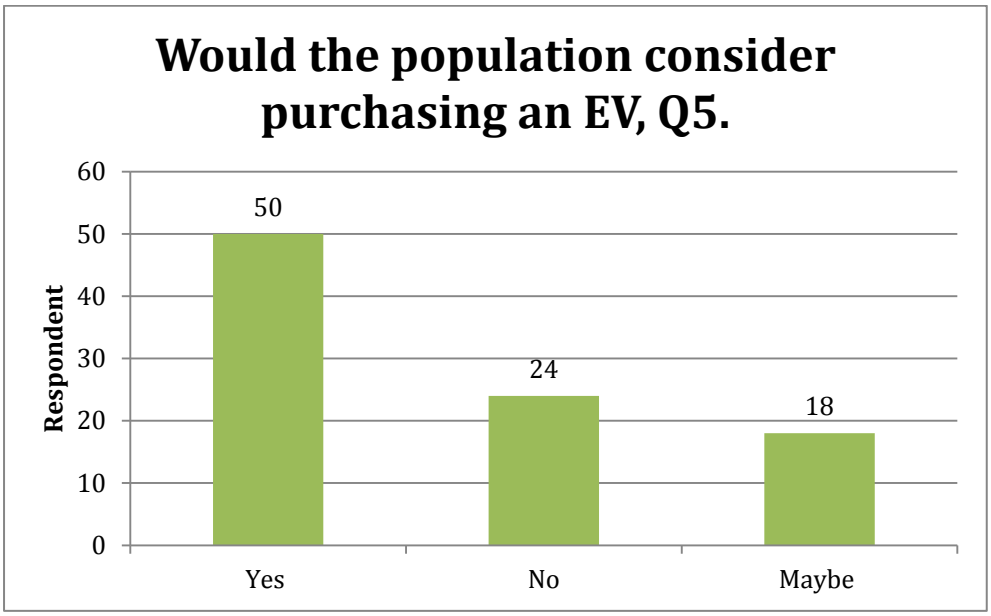

Figure 4: Whether the population would consider purchasing an EV results.

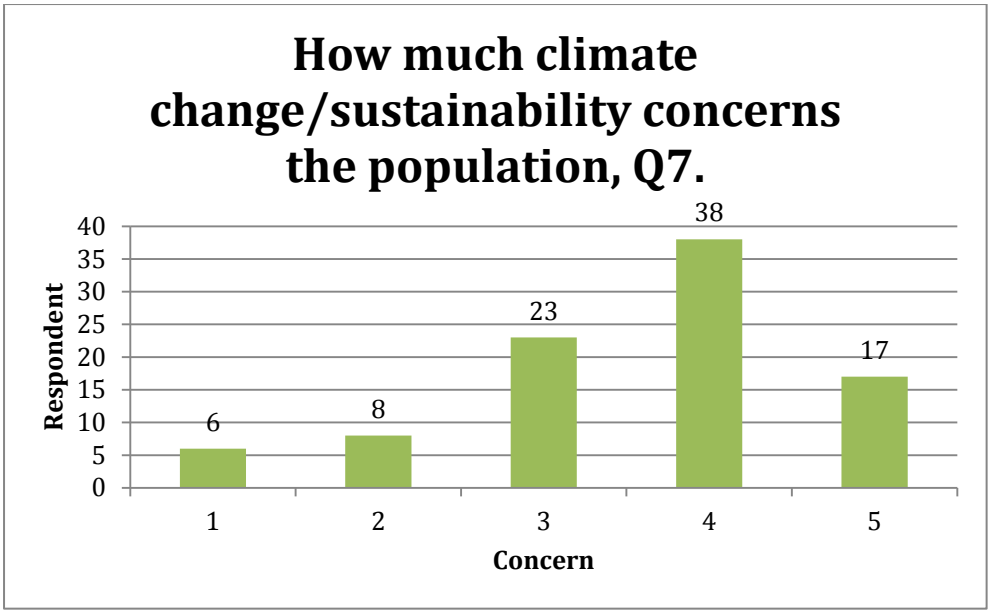

Figure 5: The population concern over climate change/sustainability results.

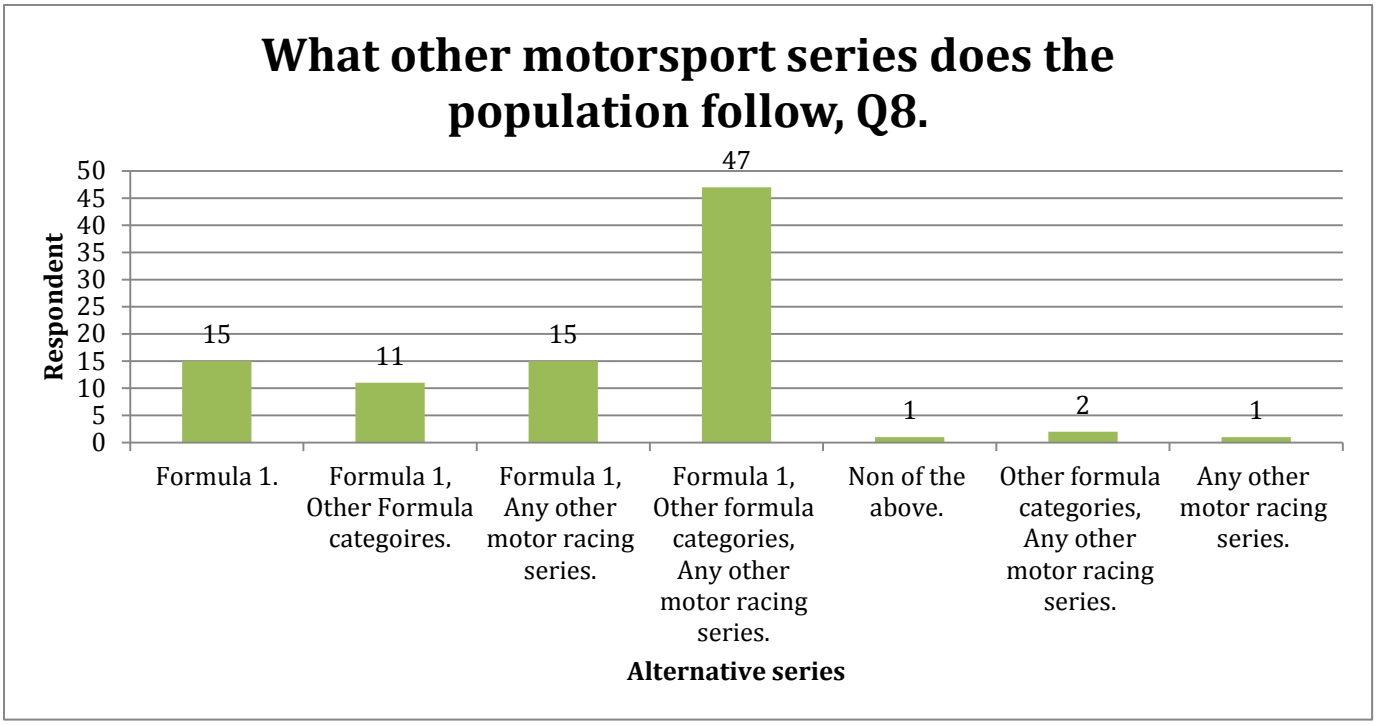

Figure 6: What other motorsport series the population follows results.

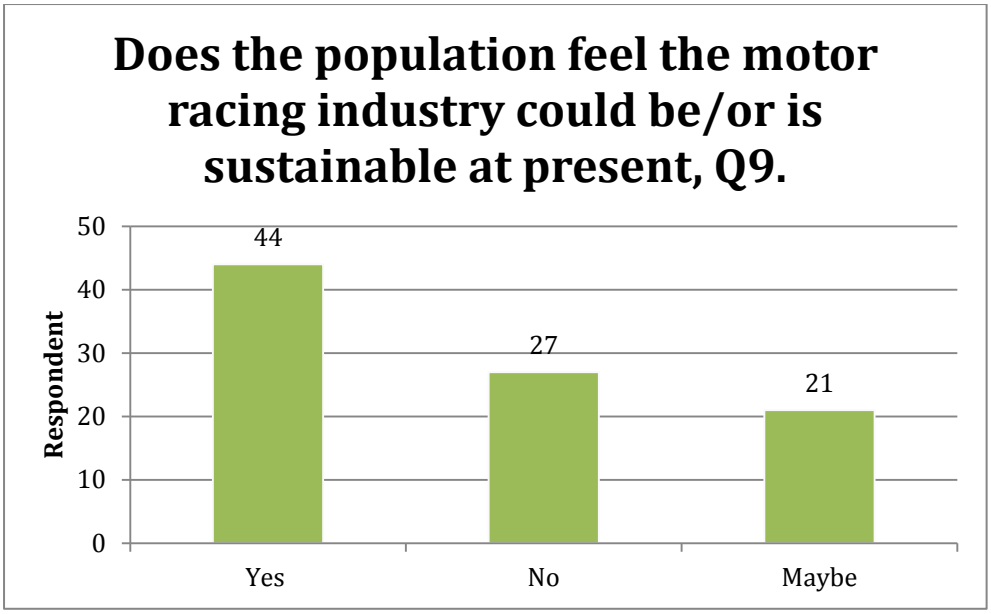

Figure 7: Whether the population feels the motor racing industry could be/or is sustainable at present results.

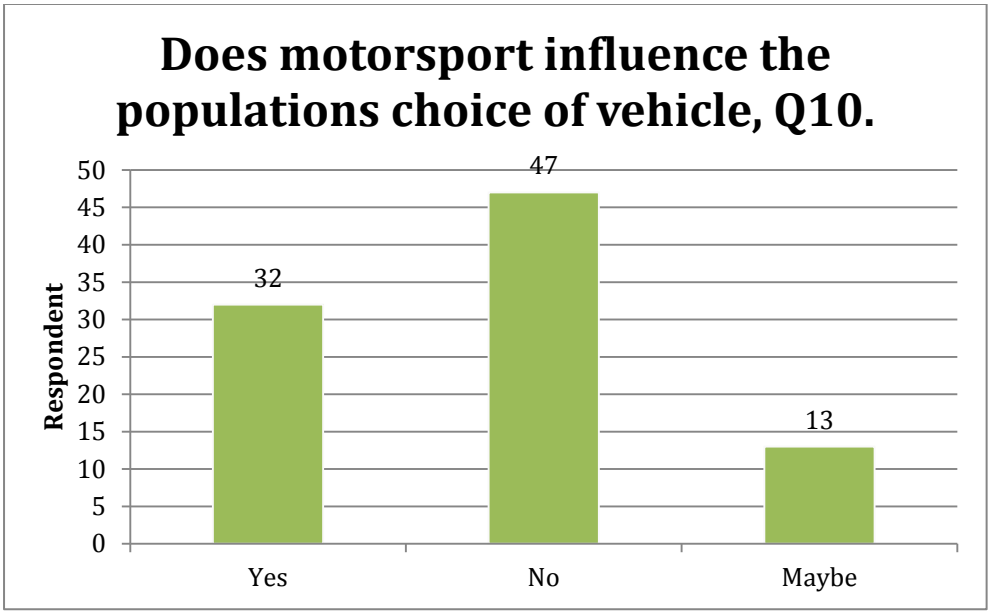

Figure 8: Whether motorsport influences the population's choice of vehicle results.

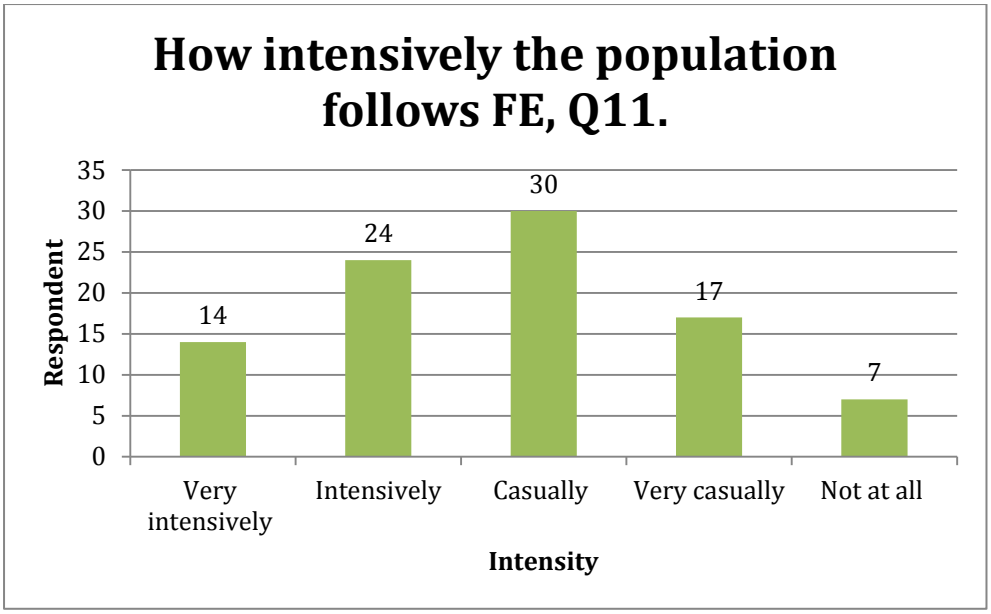

Figure 9: How intensively the population follows FE results.

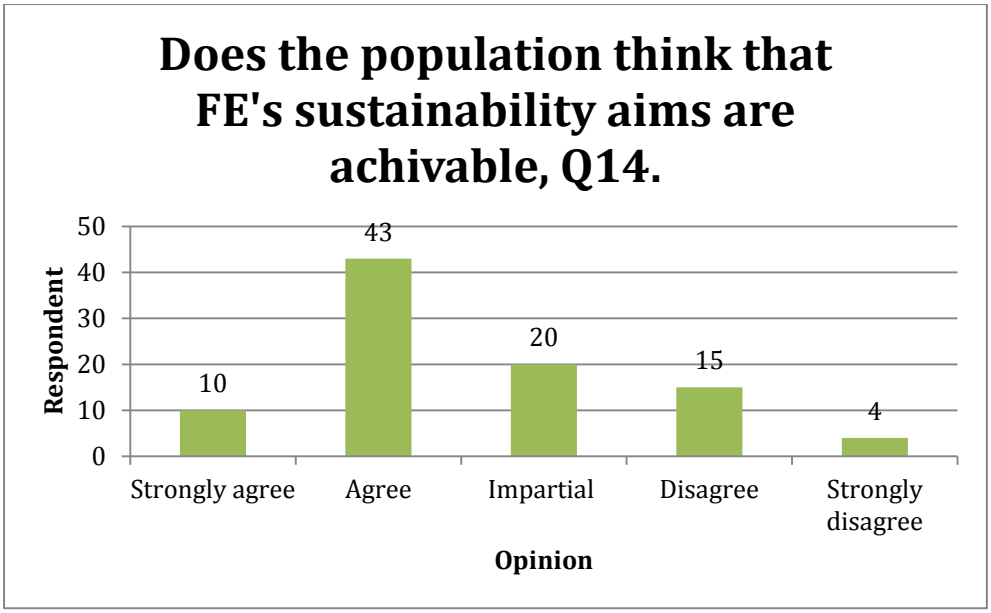

Figure 10: If the population thinks that FEs sustainability aims are achievable results.

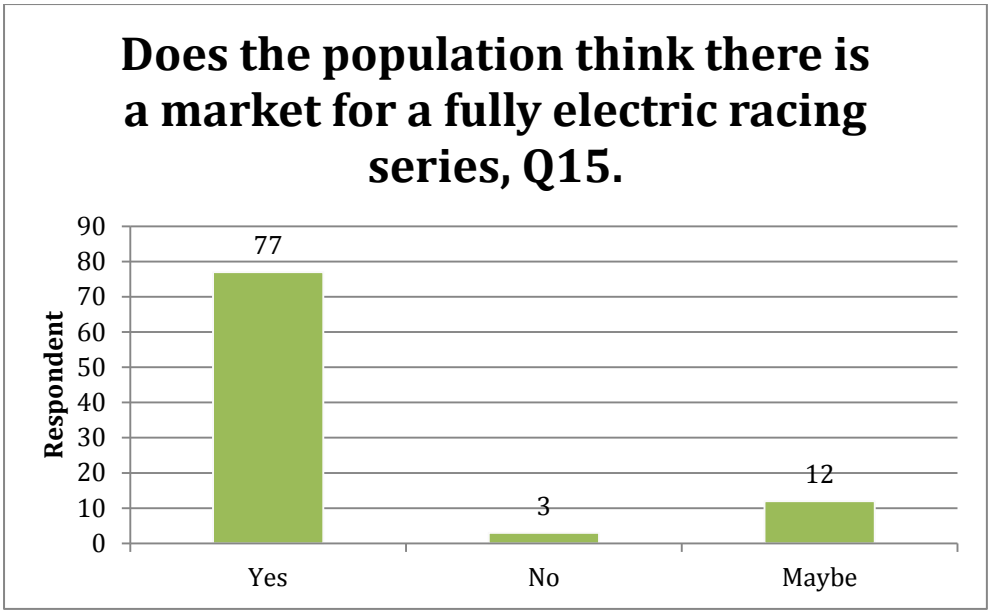

Figure 11: Whether the population thinks there is a market for a fully electric racing series results.

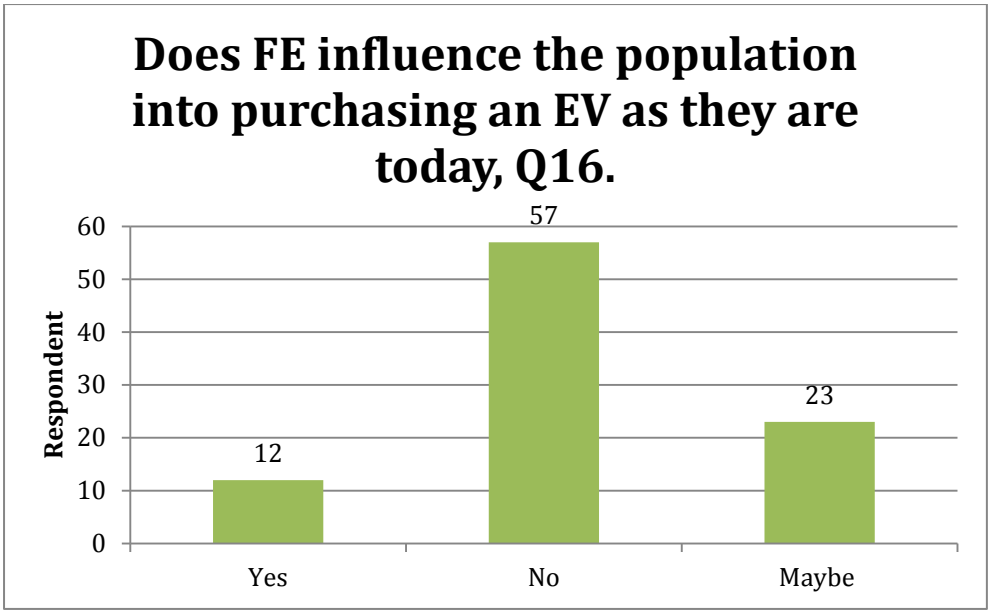

Figure 12: Whether the population is influenced by FE to purchase an EV as they are today results.

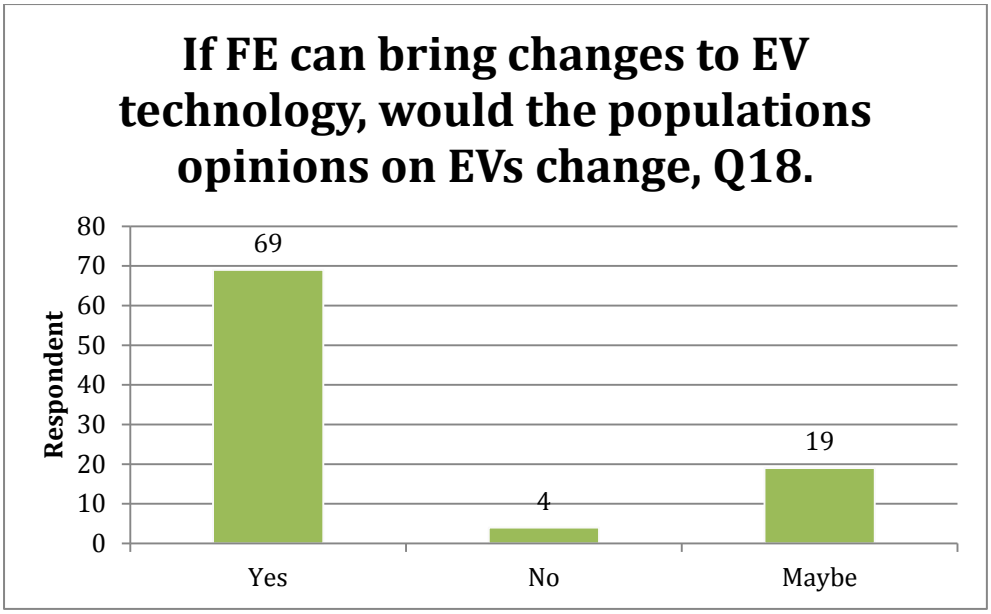

Figure 13: If FE can bring changes to EV technology, would the population's opinions on EVs change results.

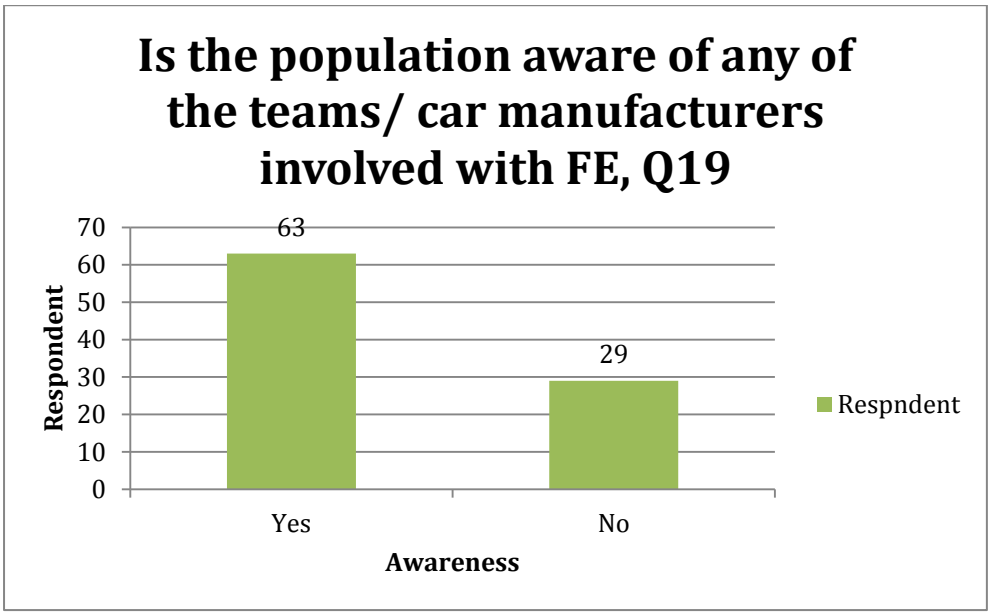

Figure 14: Whether the population is aware of any of the teams/car manufacturers involved with FE results.

4.2 Basic qualitative results

Table 1: Results for why the population would not consider purchasing an EV, (Question 6).

Reasons for "No":	**Respondents:**
Practicality reasons.	16
Prefer Hybrid technology.	1
Lack of internal combustion engine.	3
Lack of engine noise.	2
Unsustainable EV manufacturing.	4
Vehicle expense.	6
Lack of performance/image problems.	3
Lack of charging infrastructure.	8
Just shifts CO_2 production to other places.	5
EVs need development.	6
Total responses for Q6	86

Table 2: Results for why the population would consider purchasing an EV, (Question 6).

Reasons for "yes"	**Respondents:**
More economical.	30
Recent infrastructure improvements.	2
EVs are the future automobile technology.	7
More environmentally friendly.	17
EV technology improvements.	9
Electric vehicles are now desirable.	6
Social responsibility.	1
EVs are fun/exiting.	1
Total responses for Q6	86

Table 3: Positive general impressions towards FE, (Question 12).

Positive responses:	**Respondents:**
Enjoyed it/ Good entertainment.	33
Cars were desirable.	2
Good/Unpredictable racing.	26
Good for the environment.	1
Potential development opportunities.	11
Good drivers.	5
Good concept.	4
Pushing EV technology.	3
Good atmosphere.	1
Good publicity.	3
Good alternative to ICVs.	3
Total responses for Q12	81

Table 4: Negative general impressions towards FE, (Question 12).

Negative responses:	**Respondents:**
Didn't enjoy it/Boring.	3
Lack of noise/atmosphere.	12
Cars need development.	13
Just for F1 rejects.	2
Don't like Fanboost/social media input.	6
Cars are too slow.	9
Not enough media attention/publicity.	4
Total responses for Q12	81

Table 5: Positive general impressions towards FE's sustainability aims, (Question 13).

Positive responses:	**Respondents:**
Ambitious/optimistic	10
Good for promoting/pushing EVs.	11
Interesting.	2
Good start.	2
Good to reduce fossil fuel dependency.	4
Positive/Good/amazing/great goal.	30
Good for the environment.	3
This is achievable.	4
Improves public EV image.	1
Total responses for Q13	92

Table 6: Negative general impressions towards FE's sustainability aims, (Question 13).

Negative responses:	**Respondents:**
Statement can't be proved.	2
Not possible/unachievable/overly optimistic.	23
Won't make any difference globally.	2
Lack of publicity.	6
Prefer a Hybrid future.	3
Negative EV image.	4
Just designed to sell cars.	2
EV infrastructure isn't ready.	2
Implementation uncertainty.	2
EVs need development.	5
Not concerned with FE's influence on sustainability.	1
Just shifts CO_2 production to other places.	3
Not bothered	3
Figures are produced by the FIA.	1
Lack of race to road technology transfer.	1
Total responses for Q13	92

Table 7:Why the population would be influenced by FE to purchase an EV as they are today, (Question 17).

Would:	**Respondents:**
Strong race to road technology transfer.	3
EV technology improvement.	2
FE makes EVs look good.	2
More FE constructers.	1
FE potential future influence.	1
FE creates better EV publicity.	1
Social responsibility.	1
Total responses for Q17	61

Table 8: why the population would not be influenced by FE to purchase an EV as they are today, (Question 17).

Would not:	**Respondents:**
Racing doesn't influence personal choice of vehicle.	4
EV technology isn't ready.	16
Practicality issues.	14
Prefer ICVs.	2
Lack of race to road technology transfer.	7
Unsustainable EV manufacturing.	2
Preexisting interest in EVs before FE.	2
EVs still aren't desirable.	3
EVs are too expensive	7
Lack of EV publicity.	1
Poor EV public image.	3
Prefer Hybrid technology	2
Tesla is a better option to FE.	2
Lack of performance.	1
Total responses for Q17	61

Table 9: what teams/ car manufacturers the population was able to identify, (Question 19).

Teams/ car manufacturers:	**Respondents:**
Spark-Renault SRT1_01E.	1
Dallara.	2
McLaren Electronics Systems.	4
Williams Advanced Engineering.	3
Hewland.	0
Michelin.	1
DHL.	1
Renault/e-dams Renault Formula E Team.	41
Amlin Aguri Formula E Team.	13
Andretti Formula E team.	17
Audi Sport ABT Formula E Team.	33
NEXTEV TCR Formula E Team.	13
Dragon Racing Formula E Team.	17
Mahindra Racing Formula E Team.	21
Trulli Formula E Team.	18
Venturi Formula E Team.	16
Virgin Racing Formula E Team.	29
BMW.	2
Qualcomm.	1
DS/Citoren.	3
Total responses for Q20	60

5. Analysis

This section first outlines the simplified quantitate categories needed for the Chi-Square test for association, it then displays the simplified cross-examined questions for statistical analysis, finally showing the Chi-Square test for association results.

5.1 Simplified quantitative categories

Once the basic quantitative results were organized into relevant cross-tabular tables some recurring low frequency responses were identified, potentially affecting the Chi-Square test for association. To eliminate some of the extreme low frequencies, separate response categories were combined together to create new 'simplified' ones.

Table 10: Simplified age categories (question 2).

Age	Respondent
18-30	56
31+	55
Total	92

Table 11: Simplified concern over sustainability categories (question 7).

Concern	Respondent
1-3 (Lower)	37
4-5 (Higher)	55
Total	92

Table 12: Simplified intensity of FE support categories (question 11).

Intensity	Respondent
(Intensively – Very Intensively) Higher intensity	38
(Not at all – Casually) Lower intensity	54
Total	92

Table 13: Simplified opinion of whether the population thinks FE's sustainability aims are achievable categories (question 14).

Opinion	Respondent
(Strongly Disagree – Disagree) Disagree	19
(Impartial – Impartial) Impartial	20
(Agree – Strongly Agree) Agree	53
Total	92

5.2 Simplified cross examined questions

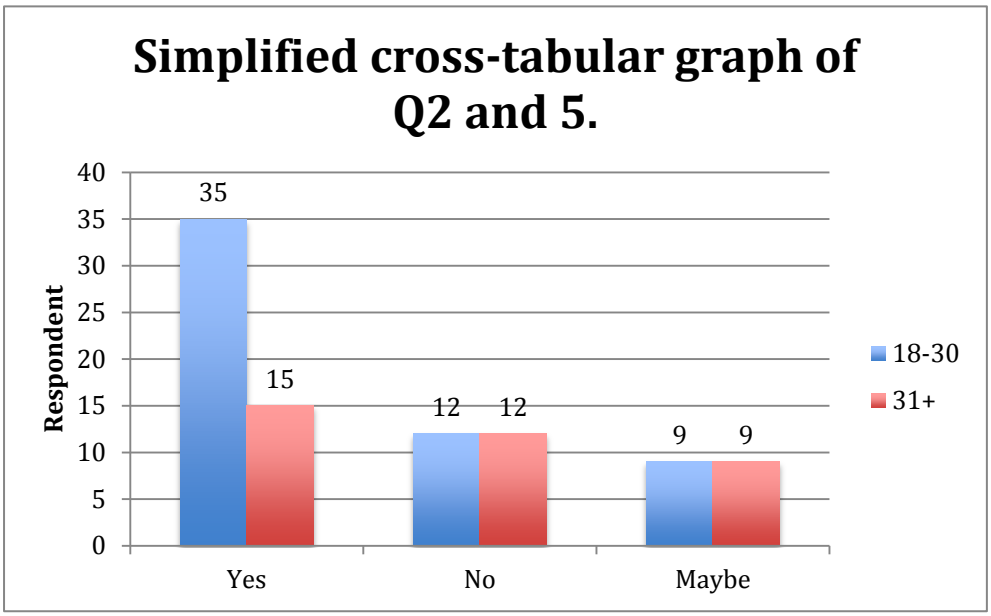

Figure 15: Graph showing whether age influences if the population would/wouldn't consider purchasing an EV, (question 2 and 5).

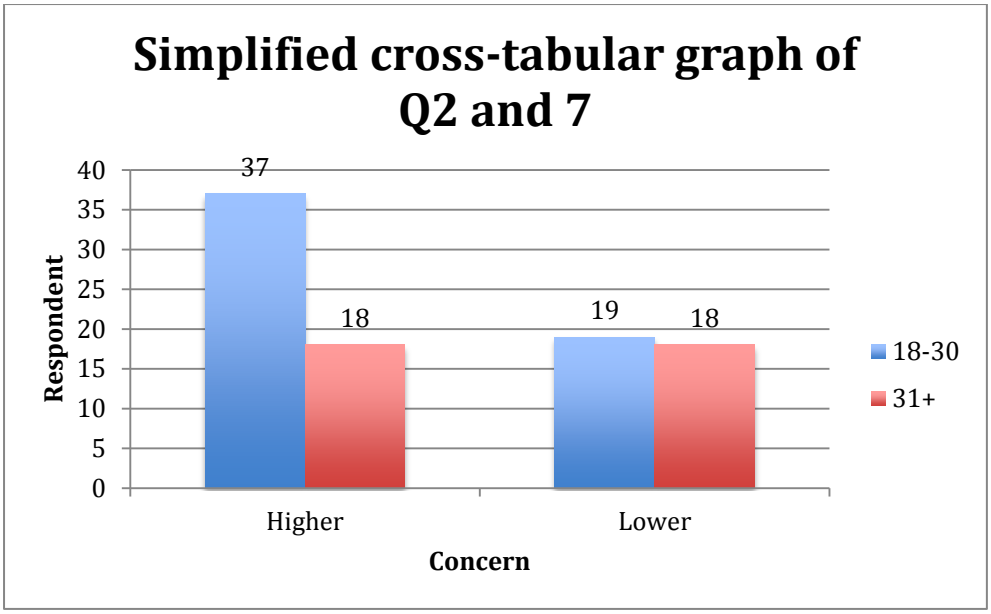

Figure 16: Graph showing whether age influences how concerned the population is over sustainability, (question 2 and 7).

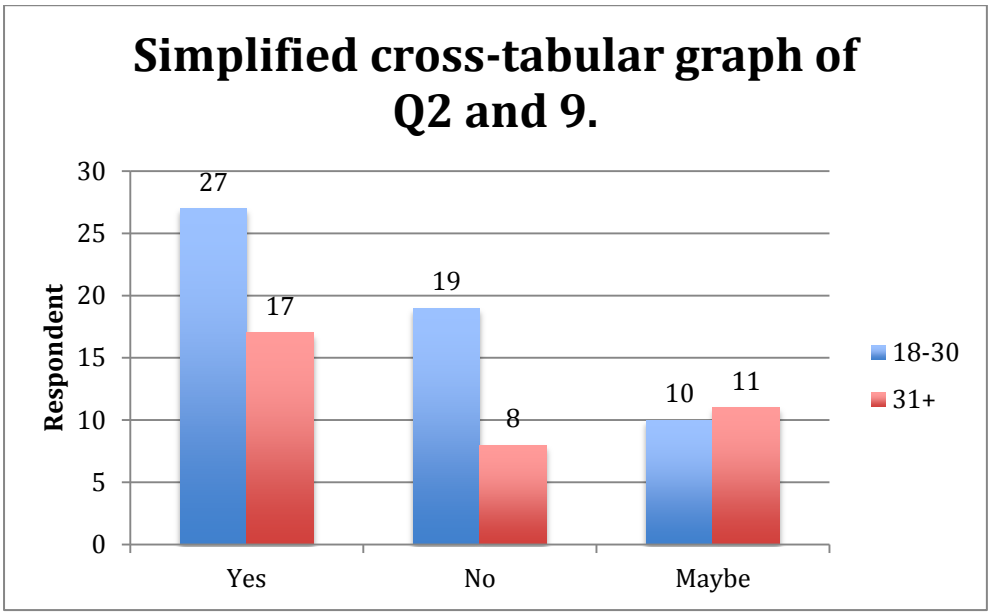

Figure 17: Graph showing whether age influences if the population thinks that the motor racing industry could be/or is sustainable at present, (question 2 and 9).

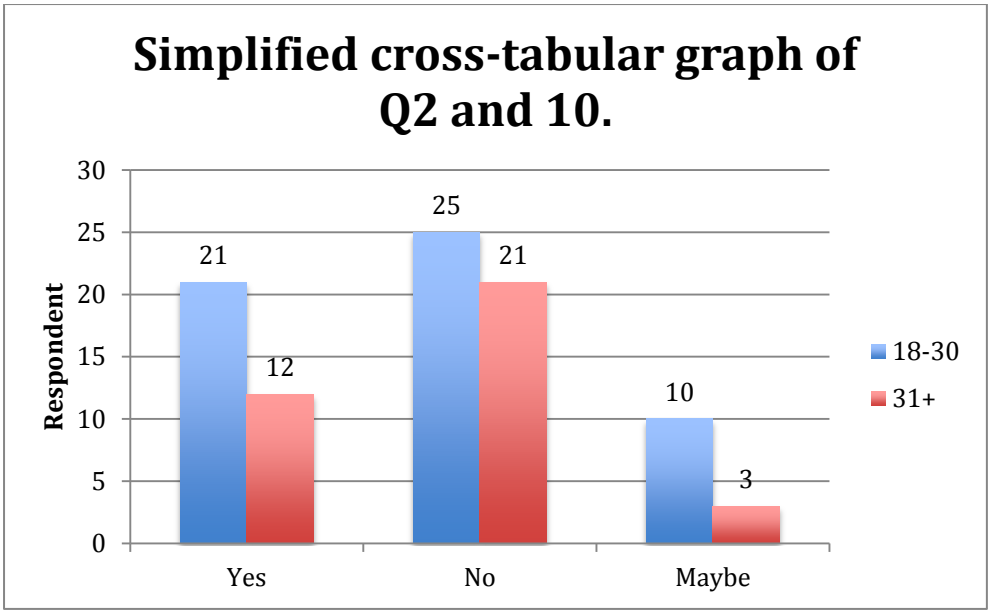

Figure 18: Graph showing whether age effects if the population is influenced by motorsport for their personal choice of vehicle, (question 2 and 10).

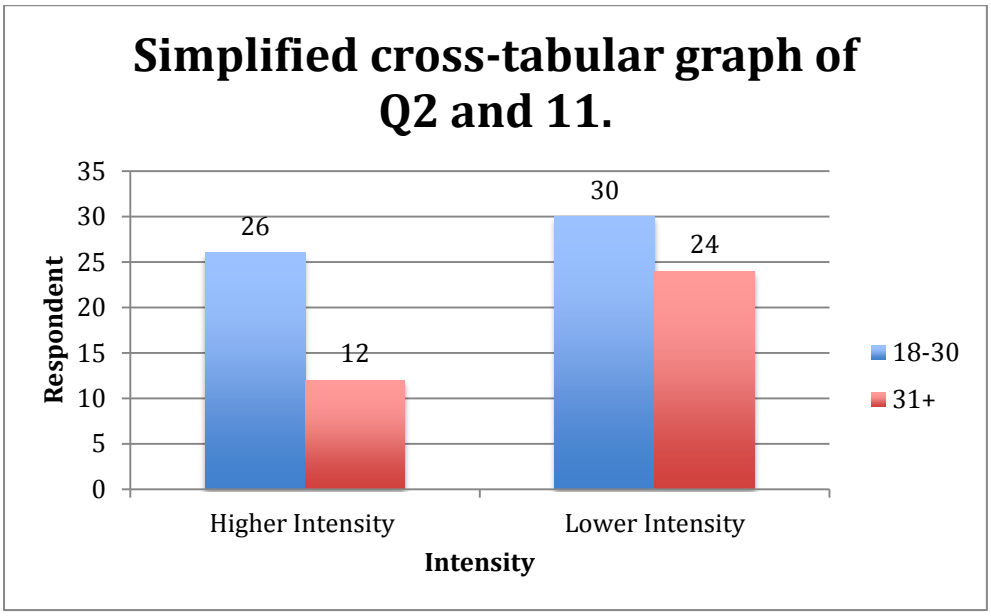

Figure 19: Graph showing whether age influences how intensely the population follows FE, (question 2 and 11).

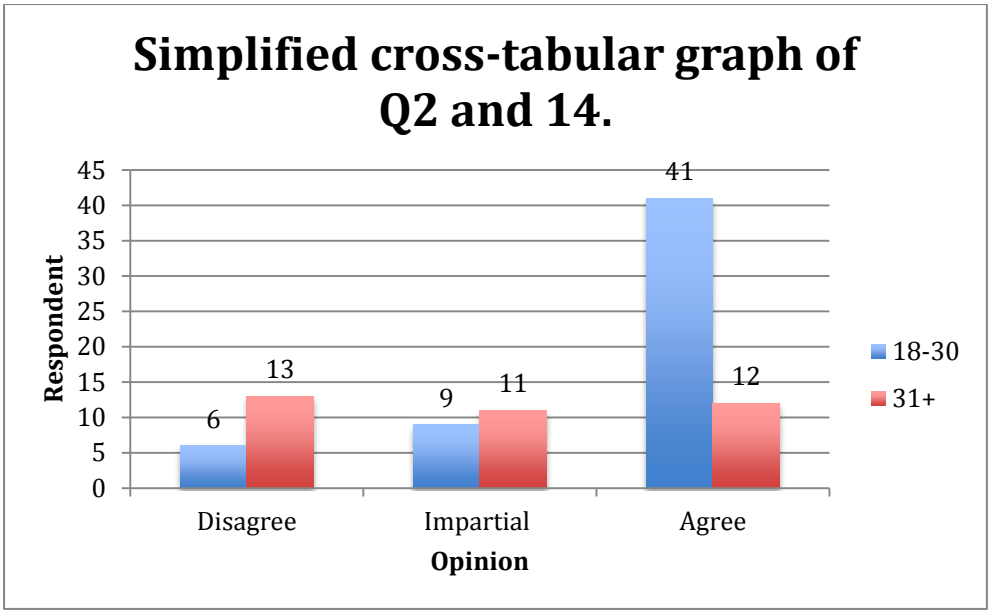

Figure 20: Graph showing whether age influences if the population agrees FE's sustainability aims are achievable, (question 2 and 14).

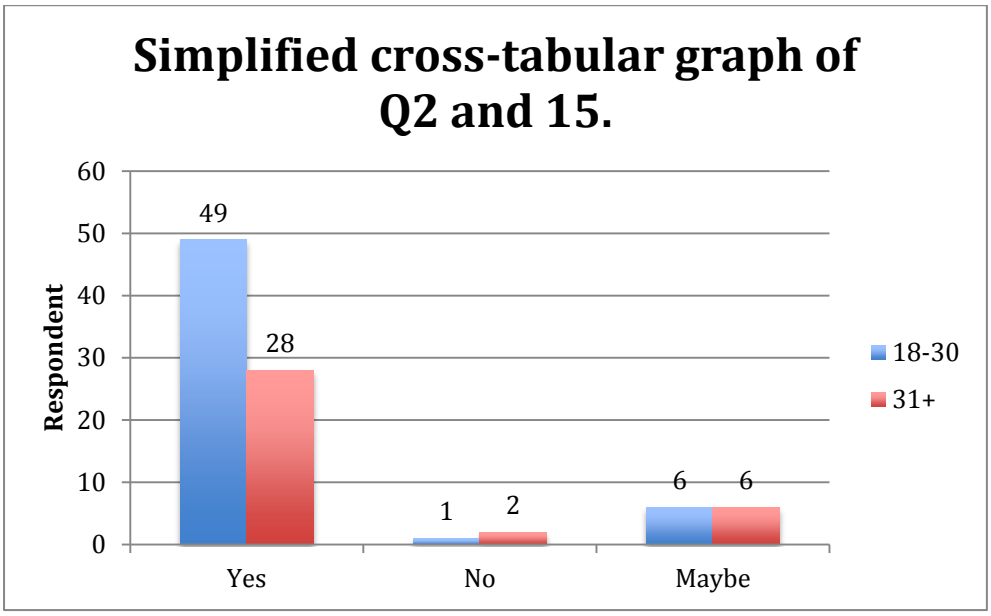

Figure 21: Graph showing whether age influences if the population thinks there is a market for a fully electric racing series, (question 2 and 15).

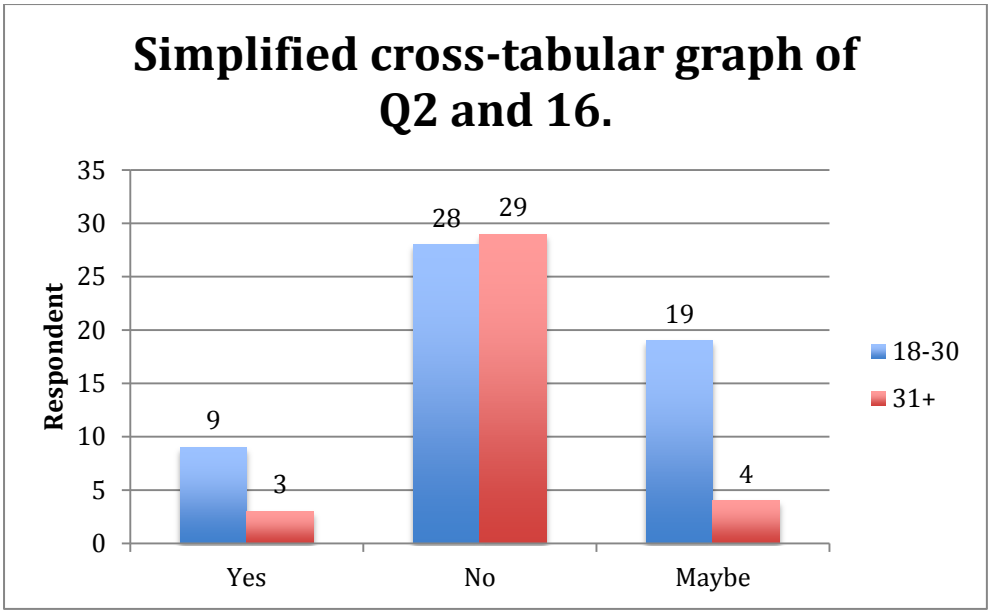

Figure 22: Graph showing whether age effects if the population is influenced by FE to purchase an EV as they are today, (question 2 and 16).

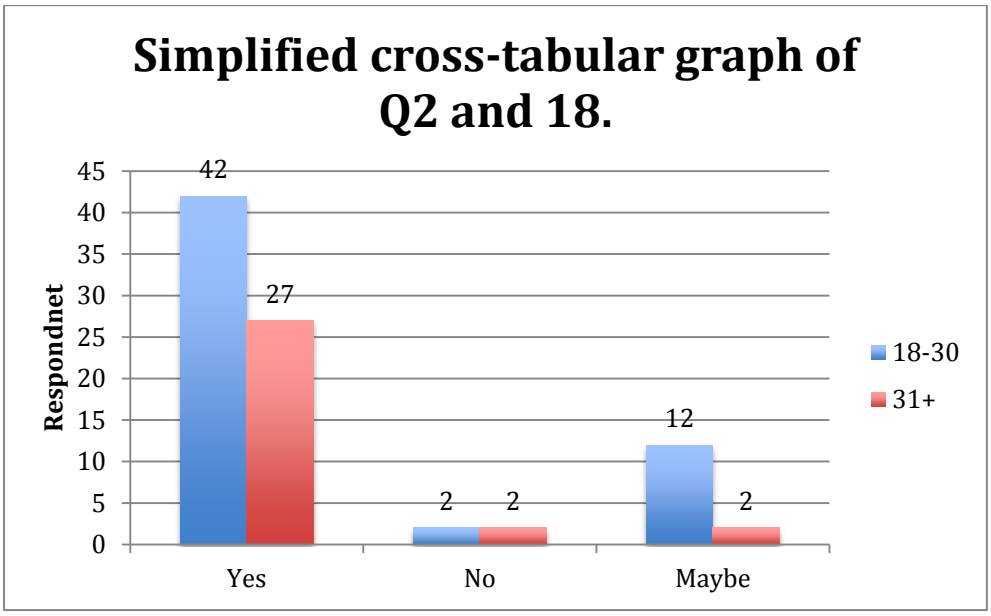

Figure 23: Graph showing whether age influences if the populations opinions on EV's would change if FE could bring changes to EV technology, (question 2 and 18).

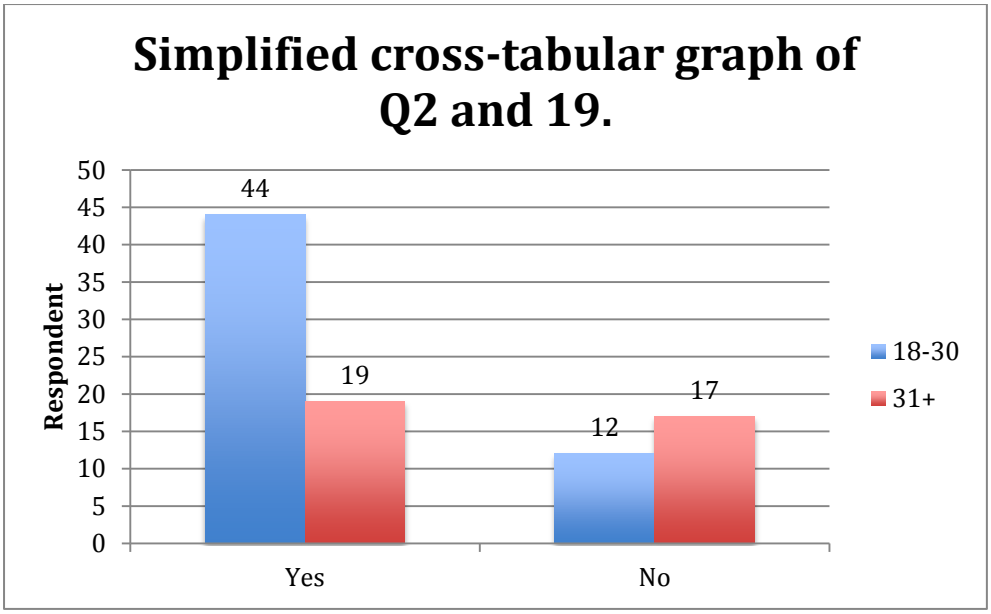

Figure 24: Graph showing whether age influences if the population are able to identify any of the teams/car manufactures involved with FE, (question 2 and 19).

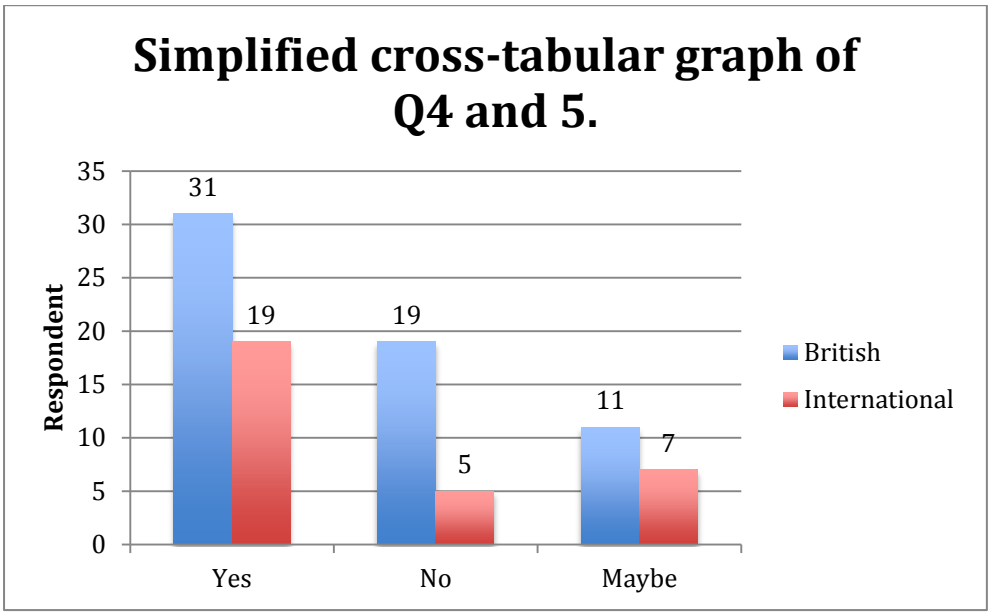

Figure 25: Graph showing whether nationality influences if the population would/wouldn't consider purchasing an EV, (question 4 and 5).

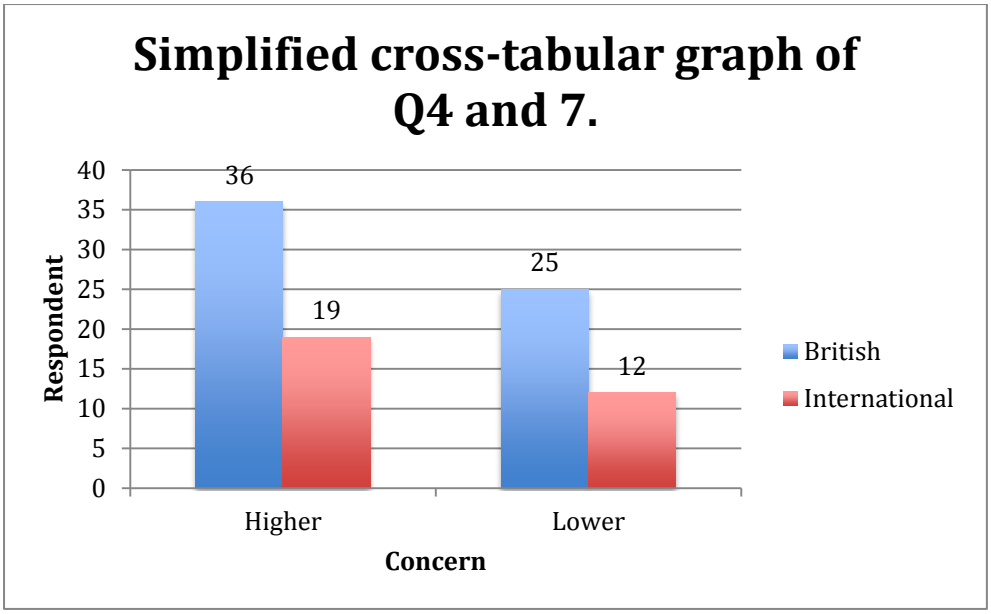

Figure 26: Graph showing whether nationality influences how much the population is concerned over sustainability, (question 4 and 7).

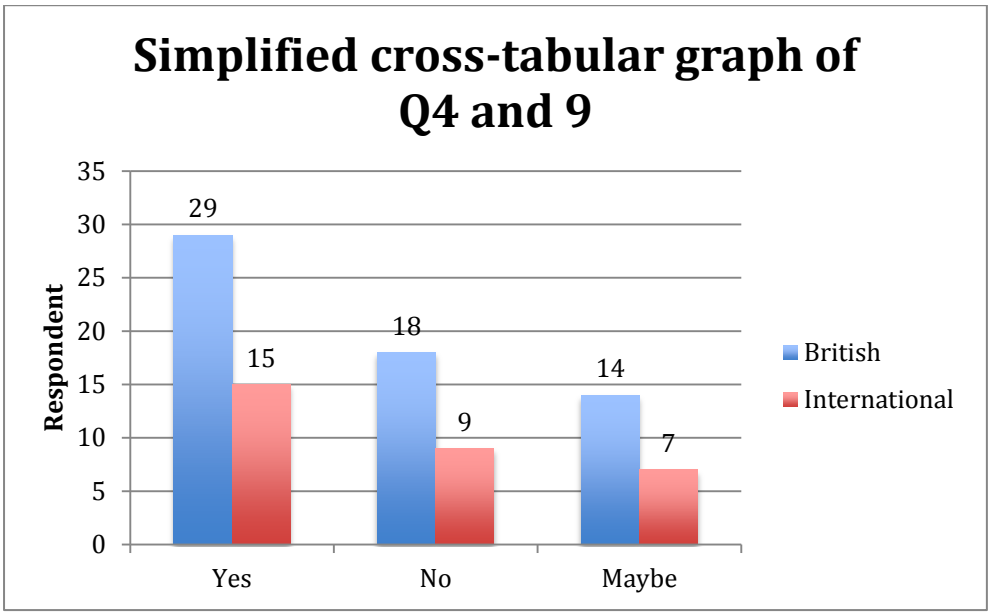

Figure 27: Graph showing whether nationality influences if the population thinks that the motor racing industry could be/or is sustainable at present, (question 4 and 9).

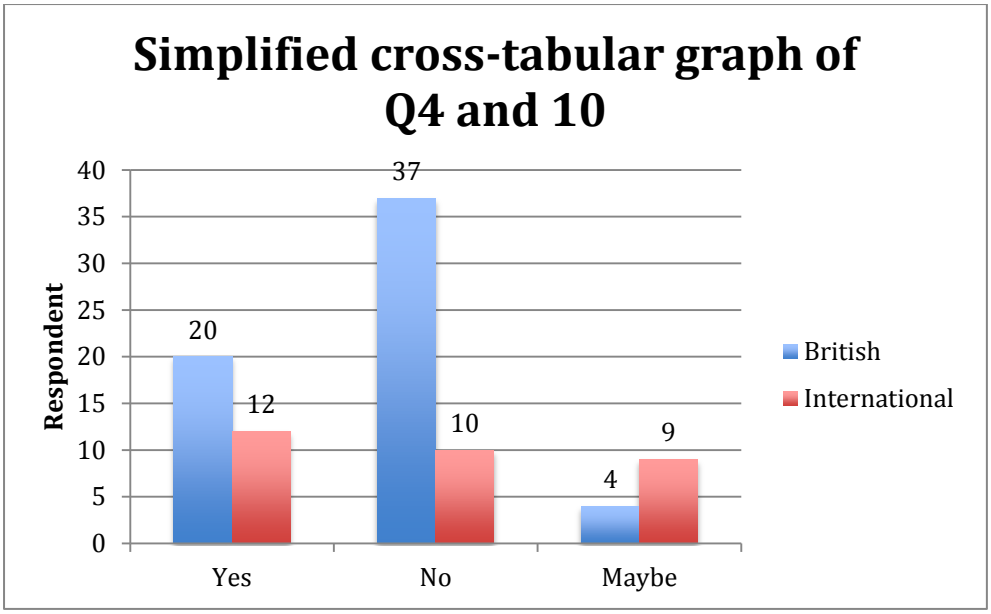

Figure 28: Graph showing whether nationality effects if the population is influenced by motorsport for their personal vehicle, (question 4 and 10).

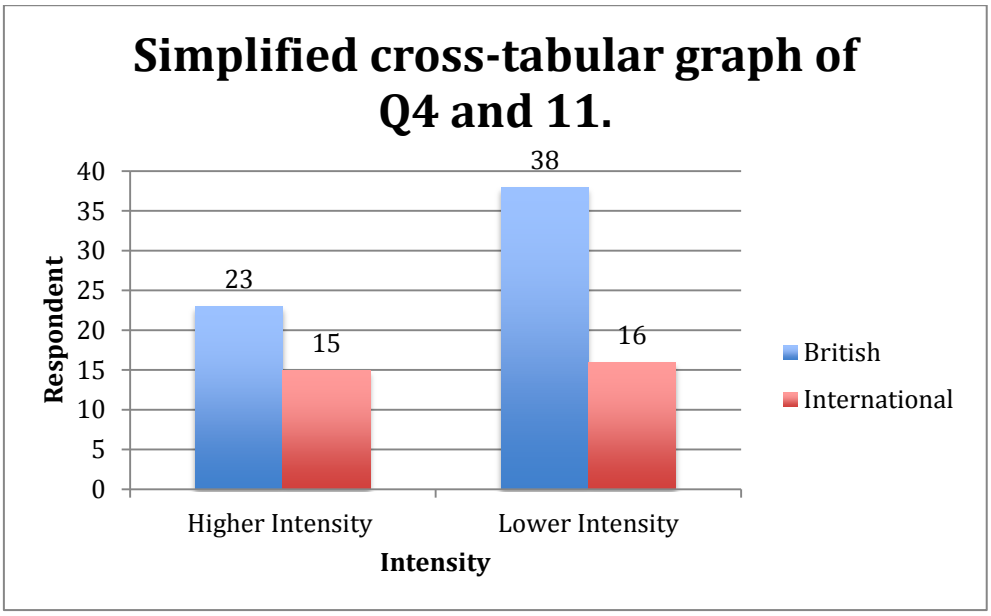

Figure 29: Graph showing whether nationality influences how intensely the population follows FE, (question 4 and 11).

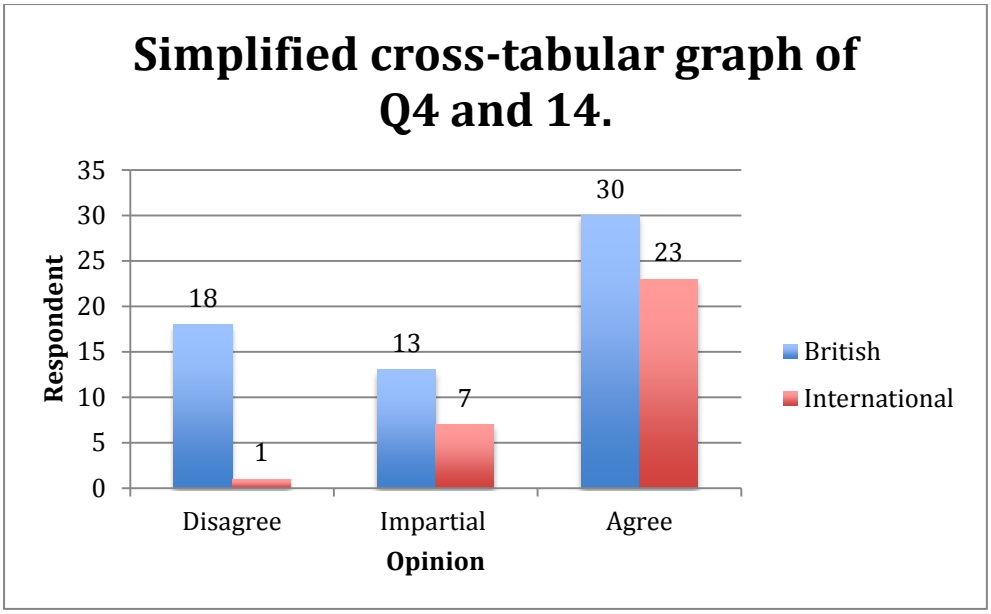

Figure 30: Graph showing whether nationality influences if the population believes that FE's sustainability aims are achievable, (question 4 and 14).

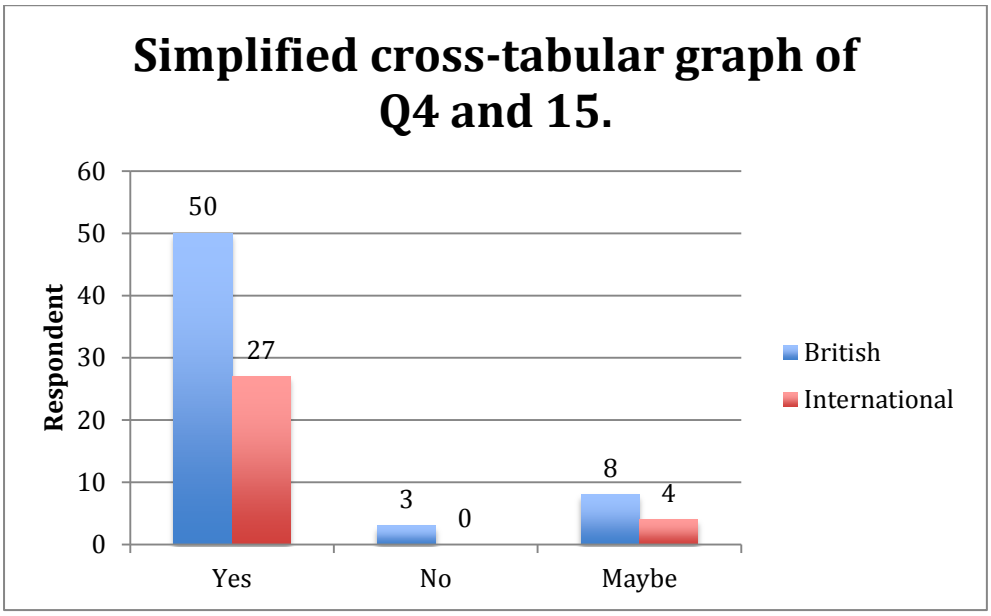

Figure 31: Graph showing whether nationality influences if the population thinks that there is a market for a fully electric racing series, (question 4 and 15).

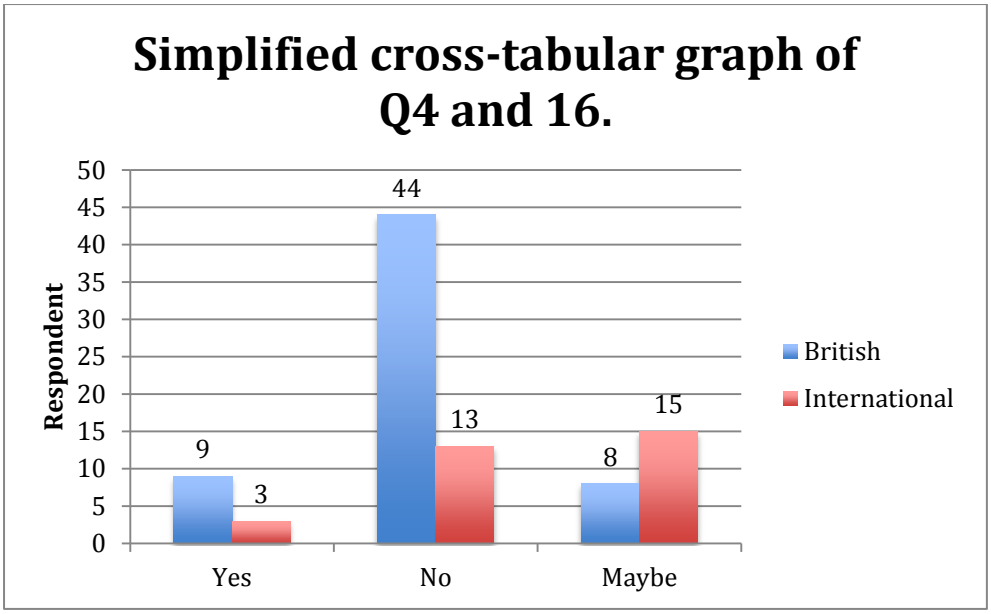

Figure 32: Graph showing whether nationality effects if the population is influenced by FE to purchase an EV as they are today, (question 4 and 16).

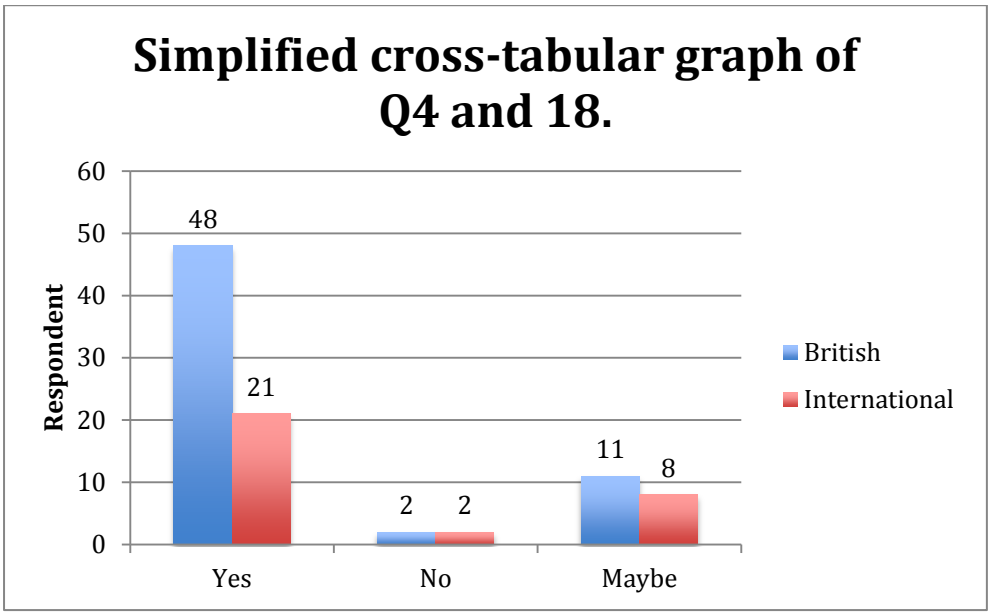

Figure 33: Graph showing whether nationality influences if the populations opinions of EV's would change if FE could bring changes to EV technology, (question 4 and 18).

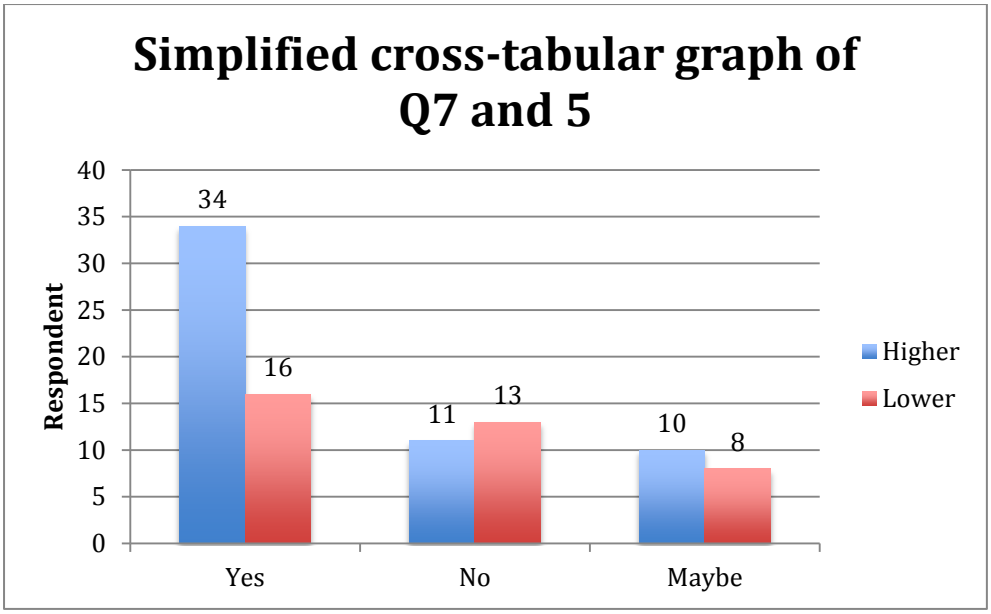

Figure 34: Graph showing whether concern over sustainability influences if the population would/wouldn't consider purchasing an EV, (question 7 and 5).

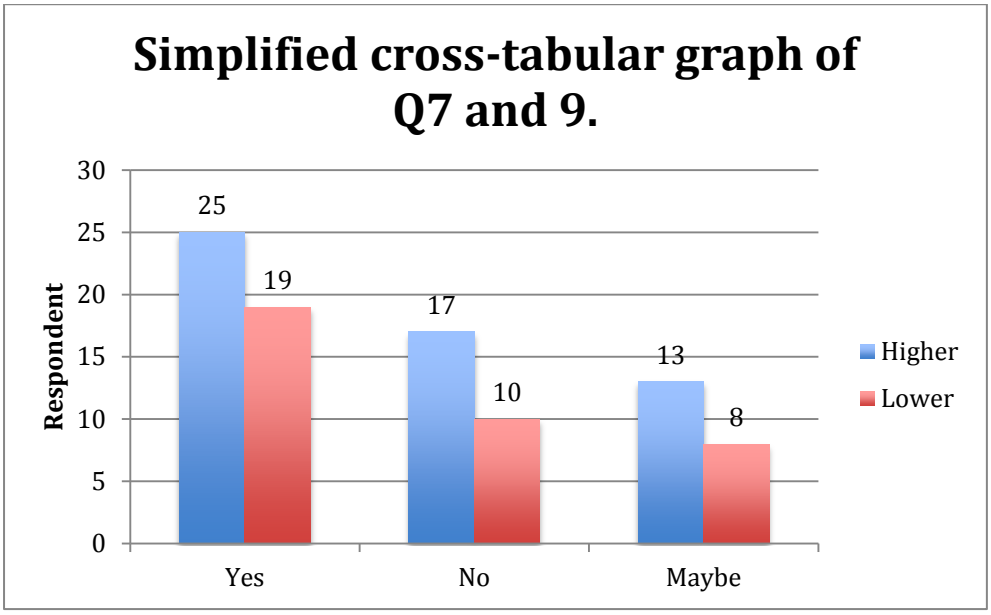

Figure 35: Graph showing whether concern over sustainability influences if the population thinks that the motor racing industry could be/or is sustainable at present, (question 7 and 9).

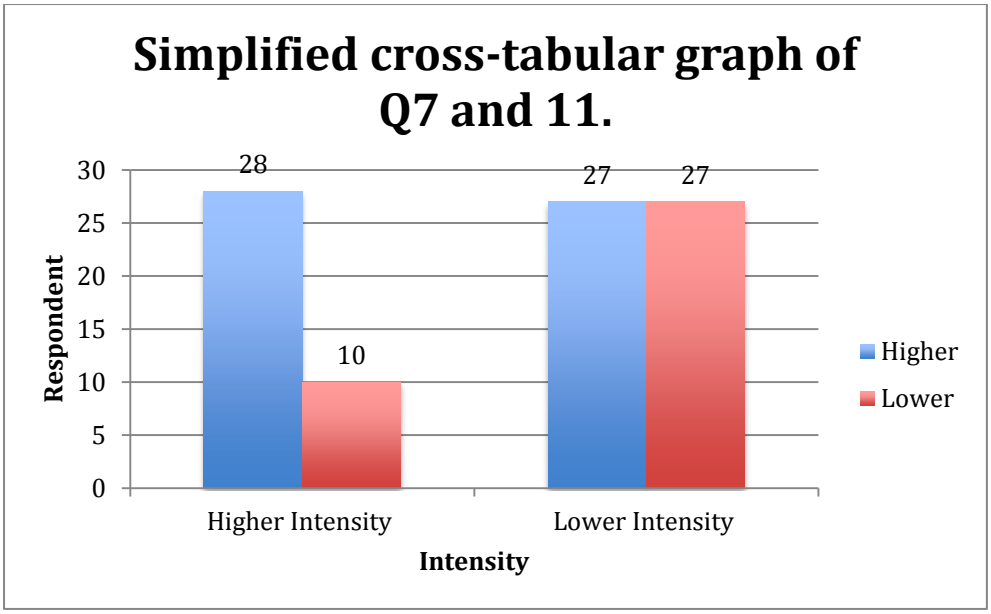

Figure 36: Graph showing whether concern over sustainability influences how intensely the population follows FE, (question 7 and 11).

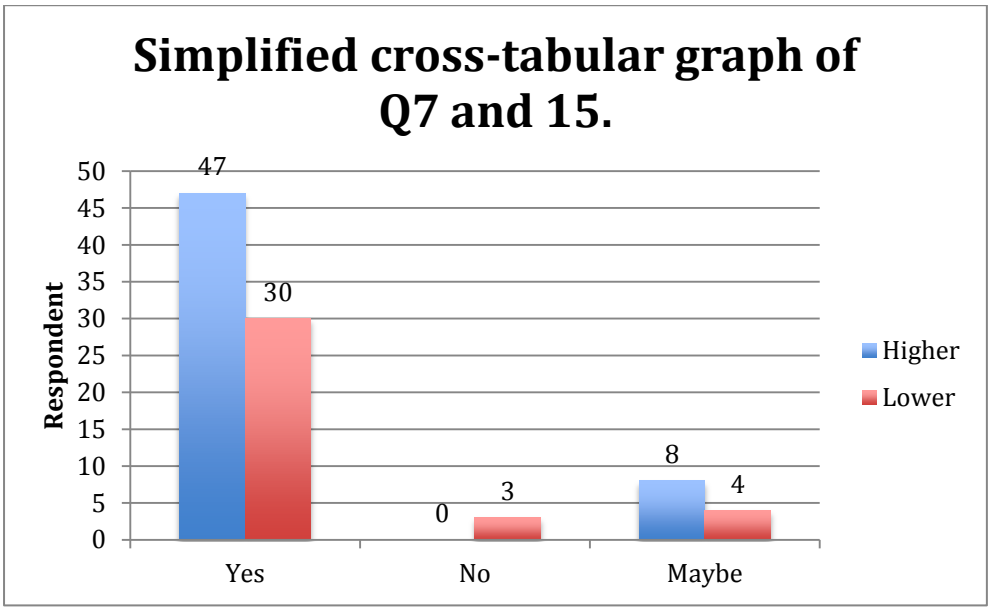

Figure 37: Graph showing whether concern over sustainability influences if the population thinks there is a market for a fully electric racing series, (question 7 and 15).

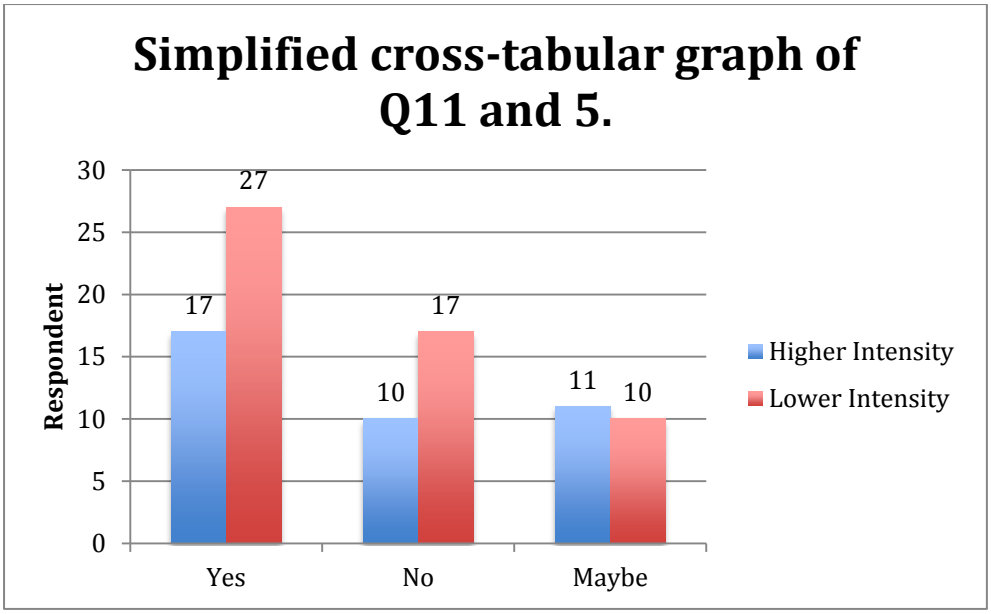

Figure 38: Graph showing whether intensity of FE support influences if the population would/wouldn't consider purchasing an EV, (question 11 and 5).

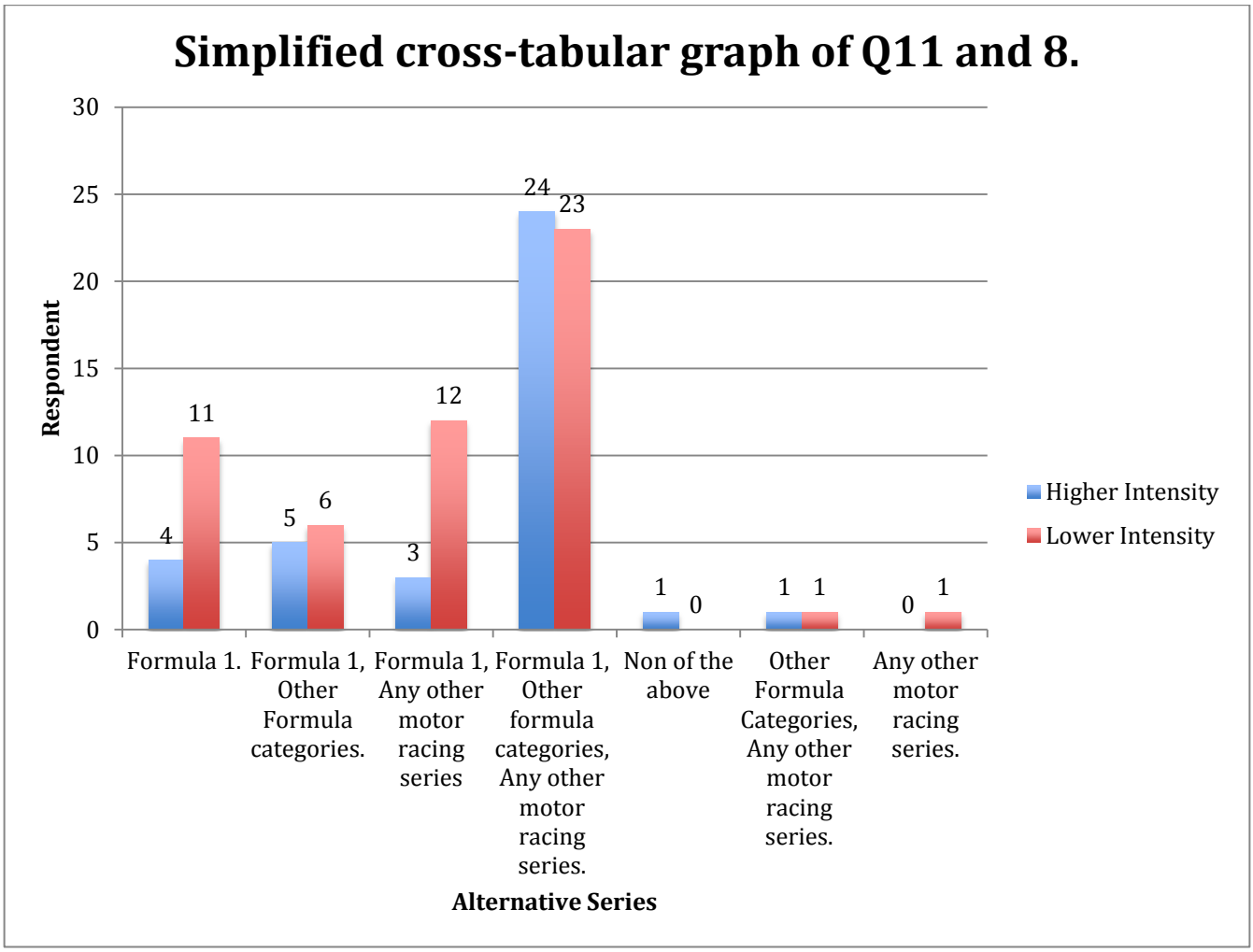

Figure 39: Graph showing whether intensity of FE support influences if the population engages with other motor racing series, (question 11 and 8).

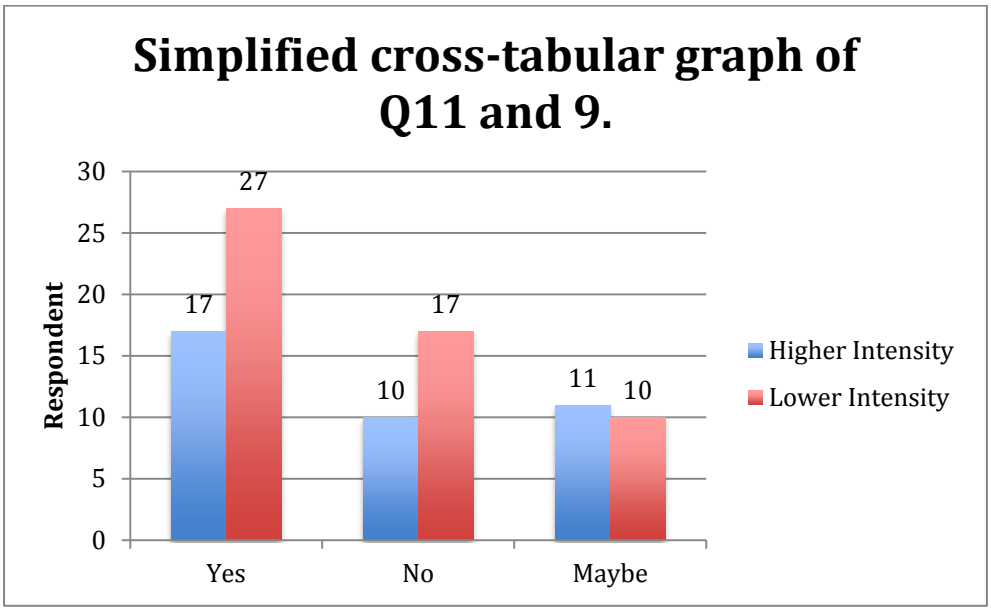

Figure 40: Graph showing whether intensity of FE support influences if the population thinks that the motor racing industry could be/or is sustainable at present, (question 11 and 9).

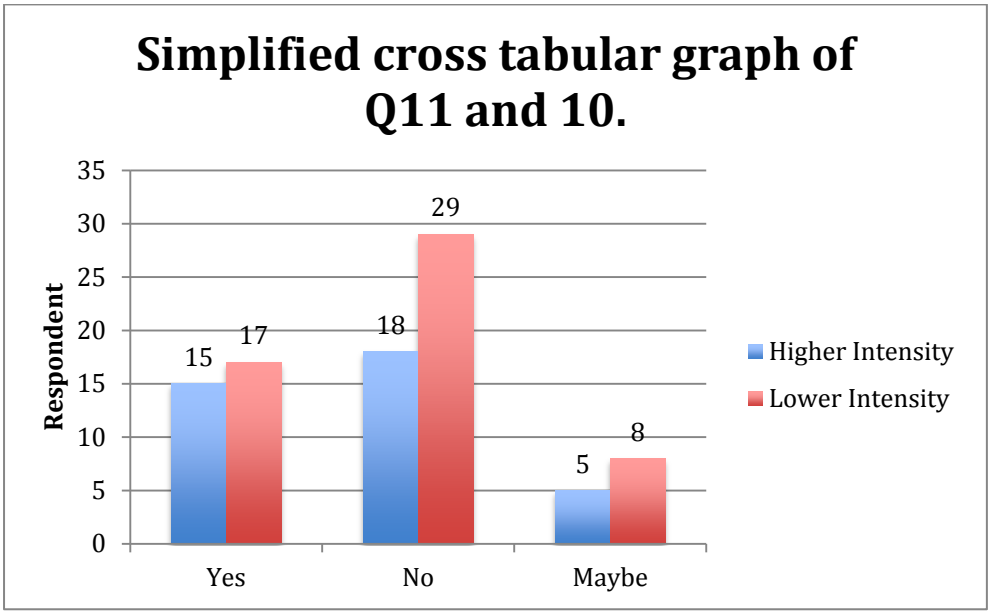

Figure 41: Graph showing whether intensity of FE support effects if the population is influenced by motorsport for their personal vehicle, (question 11 and 10).

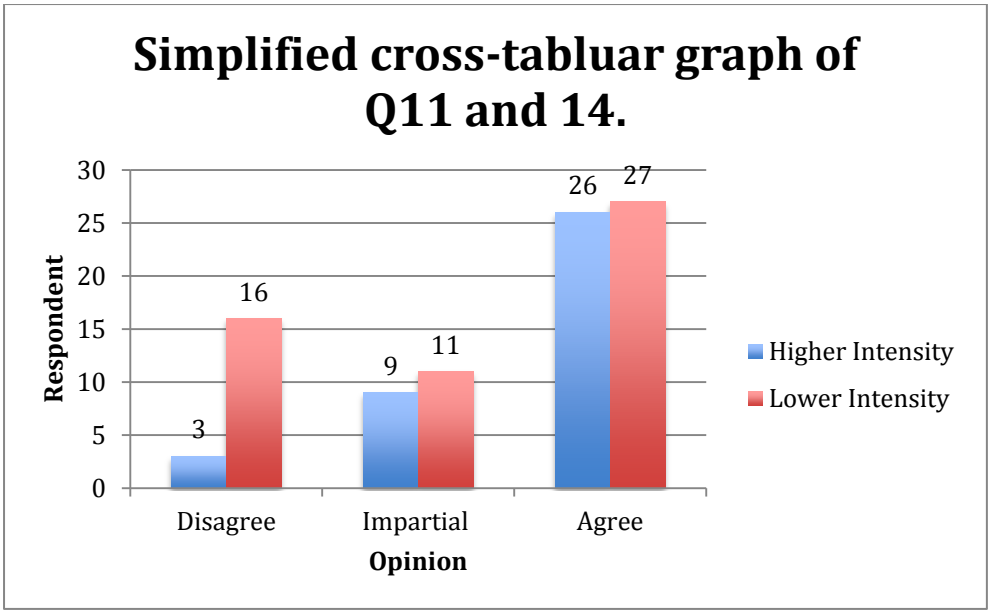

Figure 42: Graph showing whether intensity of FE support influences if the population agrees that FE's sustainability aims are achievable, (question 11 and 14).

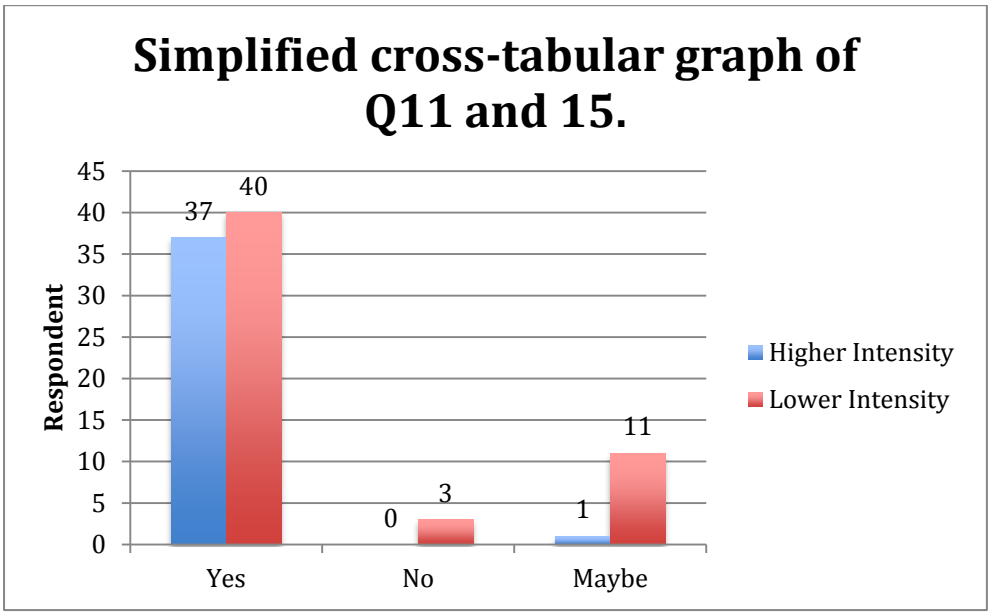

Figure 43: Graph showing whether intensity of FE support influences if the population thinks there is a market for a fully electric racing series, (question 11 and 15).

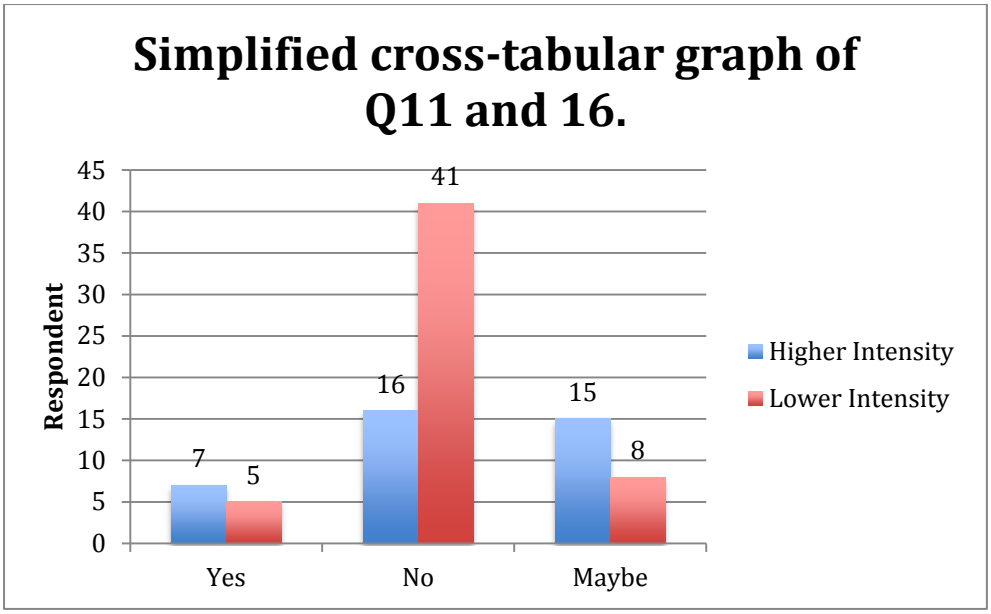

Figure 44: Graph showing whether intensity of FE support effects if the population is influenced by FE to purchase an EV as they are today, (question 11 and 16).

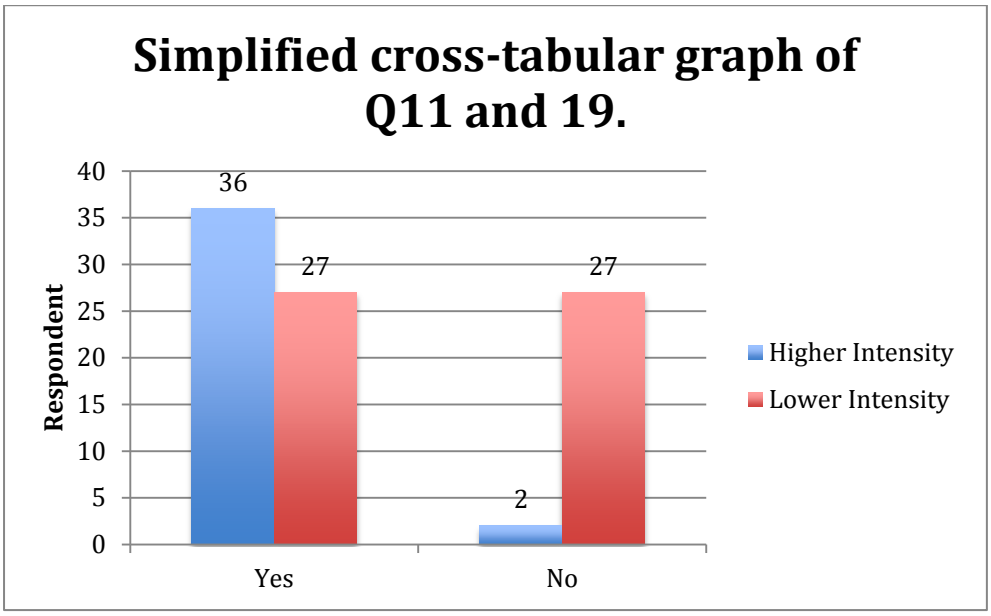

Figure 45: Graph showing whether intensity of FE support influences if the population can identify any of the teams/car manufacturers involved with FE, (question 11 and 19).

5.3 Chi-Square test for association results

The Chi-Square tests operate with the null hypothesis that there isn't any relationship between the data sets, and the alternative hypothesis that there is a relationship. For example, the null hypothesis for question 2 and 16 is that there is no relationship between the population's age and whether they are influenced by FE to purchase an EV as they are today.

The Null hypothesis is accepted if the test results are higher than the minimum 0.05 P-Value/level of confidence.

5.3.1 Age Chi-Square test for association results

Table 14: Chi-Square results for questions cross-examined with age (question 2).

Cross examined question	P-Value	Hypothesis accepted
Q2+5	0.147	Null
Q2+7	0.125	Null
Q2+9	0.276	Null
Q2+10	0.311	Null
Q2+11	0.213	Null
Q2+15	0.407	Null
Q2+16	0.012	Alternative
Q2+18	0.173	Null
Q2+19	0.009	Alternative

The Chi-Square result for whether age effects if the population is influenced by FE to purchase an EV as they are today (question 2 and 16) was P-Value 0.012, acceptable for the alternative hypothesis. This relationship suggests that the younger sample FE and motorsport supporter population are more lightly to be influenced by FE to purchase an EV as they are today.

The Chi-Square result for whether age effects if the population can identify any of the teams/car manufacturers involved with FE (question 2 and 19) was P-Value 0.009, acceptable for the alternative hypothesis. This relationship suggests that the younger sample FE and motorsport supporter

population are more able to identify the teams and manufacturers involved with FE.

All other Chi-Square test results for question 2 were above P-Value 0.05, acceptable for the null hypothesis and concluding that there was no relationship between age and the other questions.

5.3.2 Nationality Chi-Square test for association results

Table 15: Chi-Square results for questions cross-examined with nationality (question 4).

Cross examined question	P-Value	Hypothesis accepted
Q4+5	0.300	Null
Q4+7	0.833	Null
Q4+9	0.997	Null
Q4+10	0.005	Alternative
Q4+11	0.325	Null
Q4+14	0.010	Alternative
Q4+15	0.452	Null
Q4+16	0.001	Alternative
Q4+18	0.495	Null

The Chi-Square result for whether the sample British and international attitudes differs over if the population is influenced by motorsport for their personal choice of vehicle (question 4 and 10) was P-Value 0.005, acceptable for the alternative hypothesis. This relationship suggests that the sample British FE and motorsport supporter population are less lightly to be influenced by motorsport for their personal choice of vehicle.

The Chi-Square result for whether the sample British and international attitudes differ over if the population believes that FEs sustainability aims are achievable (Question 4 and 14) was P-Value 0.010, acceptable for the alternative hypothesis. This relationship suggests that the sample British FE and motorsport supporter population are less optimistic about FEs sustainability aims.

The Chi-Square result for whether the sample British and international attitudes differ over if the population are influenced by FE to purchase an EV as

they are today (question 4 and 16) was P-Value 0.001, acceptable for the alternative hypothesis. This relationship suggests that the sample British FE and motorsport supporter population are less lightly to be influenced by FE to purchase an EV as they are today.

All other Chi-Square test results for question 4 were above P-Value 0.05, acceptable for the null hypothesis and concluding that there was no relationship between nationality and the other questions.

5.3.3 Sustainability Chi-square test for association results

Table 16: Chi-Square results for questions cross-examined with level of sustainability concern (question 7).

Cross examined questions	P-Value	Hypothesis accepted
Q7+5	0.175	Null
Q7+9	0.855	Null
Q7+11	0.023	Alternative
Q7+15	0.093	Null

The Chi-Square result for whether the respondent's level of sustainability concern effects how intensely the population follows FE (question 7 and 11) was P-Value 0.023, acceptable for the alternative hypothesis. This relationship suggests that the more the sample population support FE the higher their concern over sustainability is.

All other Chi-Square test results for question 7 were above P-Value 0.05, acceptable for null hypothesis and concluding that there was no relationship between level of sustainability concern and the other questions.

5.3.4 Intensity of FE support Chi-square test for association results

Table 17: Chi-square results for questions cross-examined with intensity of FE support (question 11).

Cross examined questions	P-Value	Hypothesis accepted
Q11+5	0.038	Alternative
Q11+8	0.320	Null
Q11+9	0.498	Null
Q11+10	0.730	Null
Q11+14	0.038	Alternative
Q11+15	0.011	Alternative
Q11+16	0.004	Alternative
Q11+19	0.000	Alternative

The Chi-Square result for whether how intensely the respondent follows FE effects if the population would purchase an EV (question 11 and 5) was P-Value 0.038, acceptable for the alternative hypothesis. This relationship suggests that the more intensely the sample population follows FE, the more lightly they are to purchase an EV.

The Chi-Square result for whether how intensely the respondent follows FE effects if the population thinks that FE's sustainability aims are achievable (question 11 and 14) was P-Value 0.038, acceptable for the alternative hypothesis. This relationship suggests that with an increasing sample population support for FE comes an increasing lightly hood that they think FEs sustainability aims are achievable.

The Chi-Square result for whether how intensely the respondent follows FE effects if the population thinks there is a market for a fully electric racing series (question 11 and 15) was P-Value 0.011, acceptable for the alternative hypothesis. This relationship suggests that the more intensely the sample population follows FE, the more lightly they are to agree that there is a market for a fully electric racing series.

The Chi-Square result for whether how intensely the respondent follows FE effects if the population is influenced by FE to purchase an EV as they are

today (question 11 and 16) was P-Value 0.004, acceptable for the alternative hypothesis. This relationship suggests that the more intensely the sample population follows FE, the more lightly they are to be influenced by FE to purchase an EV as they are today.

The Chi-Square result for whether how intensely the respondent follows FE effects if the population can name the teams/car manufacturers involved with FE (question 11 and 19) was P-Value 0.000, acceptable for the alternative hypothesis. This relationship suggests that the more intensely the population supports FE, the more able they are to identify the teams and manufactures involved.

All other Chi-Square test results for question 11 were above P-Value 0.05, acceptable for null hypothesis and concluding that there was no relationship between intensity of FE support and the other questions.

6. Discussion

This discussion is divided into subsections according to the dissertation aims:

- What do motorsport supporters think of FE and what type of supporter is attracted?
- What impact could FE have on the wider commercial vehicle market?
- Do external factors (e.g. age or nationality) influence the population's opinions of FE, their sustainability aims and EVs in general?

6.1 What do motorsport supporters think of FE and what type of supporter is attracted?

According to Dingle 2009 motorsport supporters should be skeptical of FE, due to the wider motorsport area's unsustainable practices. However, this dissertation study has found that 98.9% (91/92) of respondents supported at least one other discipline of motorsport beyond FE (Figure 6), and only 3.3% (3/92) of respondents felt that there wasn't a market for a fully electric racing series (Figure 11).

Moreover, 57.6% (53/92) of respondents "agree/strongly agree" that FE's sustainability aims are achievable, while only 20.7% (19/92) "disagree/strongly disagree" (Figure 10). General positive reactions towards FE's sustainability aims included that they are positive (30/92), good for improving EV technology (11/92) and that they are ambitious but achievable (10/92) (Table 5). For example, respondent 15 is positive towards FEs sustainability aims, highlighting an importance to address fossil fuel dependency and climate change.

> I believe FE has a huge potential in advancing electric vehicles in the way of battery storage and usage. I also think that it is important to at least attempt to lower fuel emissions in the following years and reduce dependence on liquid fuel.
>
> **(Respondent 15, Q13 response)**

The overall sample impressions towards FE were positive, attracting supporters from wide range of other motor racing disciplines. However, there are misconceptions about the type of supporter FE attracts. Schuttle 2016 claims that FE shouldn't appeal to traditional F1 supporters, however, 95.7% (88/92) of

the population engaged with both F1 and FE (Figure 6). But, Schuttle 2016's claim that FE attracts a younger audience appears to be accurate, with 42% (39/92) of the sample population aged 18-25, and only 6.5% (6/92) registering as 60+ (Figure 2). This study also suggests that FEs audience is male dominated, with 89% (82/92) of respondents identifying as male (Figure 1).

Despite positive overall impressions, some of the sample FE and motorsport supporter community do have reservations about FE. 16% (13/81) of respondents claimed that FEs technology needed further development in order to improve their opinions (Table 4), and 25% (23/92) of respondents claimed that FE's sustainability aims are overly optimistic and unachievable (Table 6).

However, Many of the sample FE and motorsport supporter community still have mixed feelings towards FEs sustainability and EV expansion aims. For example, respondent 26 suggests that although the concept of FE is strong, development is required to increase FEs EV influence.

> Good idea, might need a few seasons to turn into something that is magnificent, [it has] a lot of quirks and issues right now, but overall I am satisfied for it being the first season.
> **(Respondent 26, Q12)**

Its apparent that FE attracts existing motorsport supporters, suggesting that at least some of this community is open to the concept of a fully electric racing series, and possibly EVs in general. However, it is equally clear that opinions towards FE and its wider sustainability and EV expansion aims could still see significant improvements, with many reserving judgment until they have seen the impact FE can have on real world technology.

6.2 What impact could FE have on the wider commercial vehicle market?

There is significant support from the sample FE and motorsport supporter community for EV's, with 54% (50/92) of respondents claiming that they would at least consider purchasing an EV (Figure 4). For example, respondent 3 highlights that the EVs increasing economy and infrastructure availability are making them more attractive propositions.

> [Electric] vehicles are more economical, and there are more charging ports.
>
> **(Respondent 3, Q4)**

However, 61% (57/92) of respondents claimed that they would not be influenced by FE to purchase an EV as they are today (Figure 12), perhaps showing a lack of influence FE currently has on supporters. For example, respondent 7 highlighted that they don't feel there is a relationship between race and road technology.

> The cars seen on the racing track are not the ones the public will purchase.
>
> **(Respondent 7, Q17)**

The lack of influence motorsport has on supporters doesn't appear to be limited to FE, as only 34.8% (32/92) of respondents claimed that the wider motorsport area influenced their personal vehicle choice (Figure 8).

However, FEs current lack of supporter influence is lightly to improve, as 75% (69/92) of respondents claimed that if FE could improve EV technology they would become more optimistic about EVs (Figure 13). Statistical analysis also found that with an increased intensity of FE support comes an increased influence over EV purchase patterns (question 11 and 16). As FE develops it will have an increasing influence over the sample population uptake of EVs. For example, respondent 18 claims that despite not being influenced by FE to purchase an EV as they are today, if FE can develop EV technology their opinion may change.

> Currently, no. However, in the coming years if they can develop longer between charge batteries and it is proven on the track I might.
>
> **(Respondent 18, Q17)**

Ryley and Chapman 2012 claim that the major issues facing alternative fuel vehicles are purchase costs and infrastructure limitations, the sample FE and motorsport supporter community recognize this, with the most common reason why they wouldn't consider purchasing an EV being "practicality reasons" (16/86), other concerns included infrastructure issues and vehicle expense (Table 1). For example, respondent 41 claimed that EVs are limited to urban environments by current technology, and although interesting, EVs are not comparable with ICVs.

> Until battery tech gets good enough that electric cars can match petrol cars in cruising range, electric cars will be limited to highly urban environments. While interesting, at this point in time an electric car can not in any way overcome cars running on fossil fuels.
>
> **(Respondent 41, Q17)**

Kalinauckas 2015 suggests that the major reason the public is put off by EVs is 'Range Anxiety', the worry of running out of charge mid journey, going onto claim that FE doesn't help this image issue at present, as current technology only provides one car with enough charge for half a race. Some of the sample FE and motorsport supporter community also highlight the image and publicity issues associated with FE, with respondent 35 claiming that having to swap cars mid-race highlights how EV technology isn't ready for commercial applications yet.

> …Having to swap cars mid race is dumb. Just shows to the world that electric cars are not ready for the main stream yet. Which Tesla have shown is not the case.
>
> **Respondent 35, Q12**

Sperling and Gordon 2009 suggested that despite the issues of EVs, "some consumers are willing to pay a premium for environmental cars" (Sperling and Gordon 2009 p10). Statistical analysis found that there was no relationship between the sample populations sustainability concern and how lightly they are to purchase EVs (question 7 and 5), suggesting that the sample FE and motorsport supporter's aren't willing to pay a premium for EV technology, and that for EVs to impact this community they will have to become cost effective. This is similar to the claims of Caird *et al* 2008, suggesting economical incentives are often required to convince the public to invest in low carbon technology.

Moreover, Howarth and Ryley 2012 claim that due to EV purchase expense and practicality issues new business models, such as separating vehicle and battery ownership, will be needed to make EVs more appealing (Howarth and Ryley 2012). Novel business models, improvements to EV technology and competitive pricing are needed to inspire the sample FE and motorsport supporters to increase investment in EVs.

The Foresight IIS claimed that real change in the transport sector requires big behavioral changes from drivers. However, overall qualitative responses

from the sample FE and motorsport supporter community suggest that the population want to continue owning and driving vehicles in a conventional way, with some refusing to engage with EVs purely on the grounds of preferring ICVs (respondent 30).

> Eco friendly on [the] one hand, but misses a lot of what traditionally is part of a car: a noise-making engine.
> **(Respondent 30, Q4)**

Although most publications claim that travel is a derived demand, where people only travel as far and for as long as they need too, this fails to address those who travel for pleasure (McKenzie 2003). McKenzie 2003 claims that individuals don't always choose the most logically ideal form of transport. Some of the sample FE and motorsport supporter population also site personal reasons for preferring ICVs, with 3.5% (3/86) of respondents claiming the 'lack of internal combustion engine' and 2.3% (2/86) the 'lack of noise' as major reasons why they wouldn't consider EVs (Table 1). For example, respondent 13 showed a disregard towards practicality and sustainability in the pursuit of pleasure.

> "I enjoy driver cars focused mostly on the driving experience not cars where the focus is on comfort/practicality/economy"
> **Respondent 13, Q6**

However, the results do show a large proportion of the sample FE and motorsport supporter population did consider practicality when purchasing vehicles, with 34.9% (30/86) of respondents claiming that they would consider purchasing an EV because they are 'more economical' (Table 2).

Banister 2005 claims that there is 20 years before alternative fuel can represent over 20% of the world's vehicles, while Denis and Urry 2009 highlight that the technical template for 21st century auto mobility should be decided within the next few decades. This dissertation suggests that the sample FE and motorsport supporters feel that EV technology needs development before it can challenge ICVs, but once fully optimized EVs could set the template for 21st century personal transport.

FE has the potential to increase EV expansion into the commercial vehicle market, with the sample FE and motorsport supporter population having a

positive attitude towards the future of FE and EVs. However, the sample population also has clear reservations towards the current sate of EV technology. As the technology associated with FE improves, so too will its opportunity to penetrate the commercial vehicle market.

6.3 Do external factors influence the population's opinions of FE, their sustainability aims and EVs in general?

This research allowed the sample British FE and motorsport supporter attitudes to be compared with those of the international community. Statistical analysis found that there was no significant difference between the sample British and international populations over if they would consider purchasing an EV (question 4 and 5), concern over climate change (question 4 and 7), whether the population thinks that the motor racing industry could be/or is sustainable at present (question 4 and 9), whether the population thinks there is a market for a fully electric racing series (question 4 and 15) and whether the populations opinions of EVs would change if FE could bring improvement to EV technology (question 4 and 18). It would appear that some unilateral international sustainability agreement extends into the sample FE and motorsport supporter community.

However, there are certain areas where the sample British and international population opinions do differ. Statistical analysis found that the sample British FE and motorsport supporter community are less lightly to be influenced by motorsport for their personal choice of vehicle (question 4 and 10), are less influenced by FE to purchase an EV as they are today (question 4 and 16), and are less optimistic about FEs sustainability aims (questions 4 and 14). These findings are similar to the nationality differences found by Leiserowitz *et al* 2006, suggesting that despite much international sample population consensus, for FE to successfully implement their sustainability and EV expansion aims they will need to tailor their incentives for different countries.

Cotton and Alcock 2013 concluded in their study that younger people engage with, and have a more developed understanding of, sustainability when compared to other sectors of society. Statistical analysis found that the sample

population aged 18-30 was more lightly the be influenced by FE to purchase EVs than those aged 31+ (question 2 and 16), and were more able to identify the teams/car manufacturers associated with FE (question 2 and 19), suggesting that the younger sample FE and motorsport supporter community could have a higher interest in, and influence by, FE.

However, all other statistical analysis results suggested that age didn't influence if the sample population would purchase an EV (question 2 and 5), the populations concern over sustainability (question 2 and 7), if they feel that the motorsport industry is/or could be sustainable at present (question 2 and 9), if they are influenced by motorsport for their personal choice of vehicle (question 2 and 10), how intensively they follow FE (question 2 and 11), whether they feel there is a market for a fully electric racing series (question 2 and 15), and whether their opinions on EVs would change if FE could bring changes to EV technology (question 2 and 18).

Although the younger sample population may be more influenced by FE to purchase EVs and are more able to identify the teams/manufactures involved, statistical analysis has also found that age has little bearing on general EV opinions, intensity of FE support and how FE could change future EV opinions.

Statistical analysis also found that with in increasing level of sample FE support comes an increasing lightly hood that the population would purchase an EV (question 11 and 5), an increasing sustainability concern (question 7 and 11), an increasing belief that FEs sustainability aims are achievable (question 11 and 14), an increasing belief that there is a market for a fully electric racing series (question 11 and 15), an increasing influence by FE to purchase an EV as they are today (question 11 and 16), and an increasing ability to name the teams/manufactures involved with FE (question 11 and 19). These results suggest the more FE can engage their supporter community, the higher their chance of impacting EV expansion.

External factors do influence the sample FE and motorsport supporter population, with a less optimistic British attitude highlighting the importance of FE tailoring their sustainability initiatives to suit different national markets. Also, although FE attracts an environmentally conscious and young audience, age doesn't necessarily have a bearing on EV opinions and overall intensity of FE

support. However, an increasing intensity of FE support categorically increases the lightly hood of overall FE sustainability and EV expansion success.

7. Conclusion

This section first outlines the research conclusions, then highlights the studies limitations, finally making suggestions about potential future studies into FE.

7.1 study conclusions

This research found that the sample FE and motorsport population is generally positive towards FE, with many thinking there is the market for EV racing. The sample population also thought that, although sometimes overly optimistic, FE's sustainability aims are achievable.

However, the sample population did raise concerns over the limits that current EV technology imposes on FE, the need for more 'race to road' technology transfer and better media coverage.

This research found that despite the intensity of FE support, the sample population engaged with other motor racing categories, and that FE supporters should not be treated as an isolated group.

FE does have the potential to influence the wider EV market, with some of the population already considering purchasing EVs, and many more claiming that if FE could bring improvements to EV technology their opinions on EVs would also improve. However, some of the sample population is not convinced by EVs, claiming that EV technology and infrastructure isn't ready for commercial use yet.

There were also differences between the sample British and international FE and motorsport supporter communities, with the sample British population being less influenced by motorsport and FE to purchase EVs and less optimistic about FE's sustainability aims. FE's public strategy must take on regional differences, ensuring effective and relevant EV promotion.

Finally, with an increasing intensity of sample FE support comes an increasing lightly hood that the population would consider purchasing an EV, an increasing concern over sustainability and an increasing support for FE's sustainability aims.

FE has the potential to improve motorsport sustainability, helping EV public expansion by improving the EV image, technology and infrastructure. However, uncertainty around EVs still remain, the sample FE supporter population still feel that EV technology needs improvement and there is no guarantee that FE will influence public behavioral changes. If FE is to achieve its sustainability and EV expansion aims, it must ensure EV technology and infrastructure develops rapidly enough to outcompete other carbon neutral technologies, becoming the template for 21st century transport.

7.2 Study limitations and future studies

Due to the small-scale study size only 92 respondents were collected for the final survey, with over half registering as British. If the study were to be repeated a larger sample size and more international representation would be desirable.

Future studies could focus on what FE and motorsport supporters actually think 'sustainability' means, as this term can cause confusion. Also, with FE already into its second season, a study could be conducted into how FE and motorsport supporter attitudes towards FE have changed since the sports conception.

Word Count: 10919

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Appendix 1

Formula E Questionnaire

My name is Robert Webster, I am a student at the University of Central Lancashire. This is a dissertation project into Formula E, its sustainability aims and the way it can influence motorsport supporters.

The data collected from this questionnaire will be used for my dissertation, every response is anonymous and all the results will be password protected. An optional email address for a chance to win the £10 Amazon voucher may be included in the answers if you choose.

Optional Questions = (o)

1) Age:

- ○ 18-25
- ○ 26-30
- ○ 31-40
- ○ 41-60
- ○ 60+

2) Gender:

- ○ Male
- ○ Female
- ○ Other

3) Email Adress (o):

4) Type of Occupation (o):

5) Nationality (o):

6) Would you consider purchasing an electric vehicle:

○ Yes ○ No ○ Maybe

7) Why would you consider/not consider this (o):

8) How much does sustainability/climate change concern you on a scale of 1 (not at all) to 5 (highly):

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

General Motorsport Information

9) Do you follow/support/engage with:

- ☐ Formula 1
- ☐ Other Formula categories (eg Formula 3)
- ☐ Any car related racing series
- ☐ Any motor racing series
- ☐ Non of the above

10) Do you feel the Motor Racing Industry could be/or is sustainable at present:

○ Yes ○ No ○ Maybe

11) Does motorsport influence your choice of motor vehicle:

○ Yes ○ No ○ Maybe

12) If yes to question 11, why (o):

Formula E

13) How intensively do you follow Formula E:

- ○ Very Intensively
- ○ Intensively
- ○ Casually
- ○ Very casually
- ○ Not at all

14) What are your general impressions of Formula E (o):

The FIA Formula e championship value creation and sustainability report 2013 say that Formula E want to improve commercial electric vehicles, contribute the sale of 77million more electric vehicles, save up to 4billion barrels of oil and avoid 900million tonnes of CO2 over the next 25 years.

15) General impressions of the statement above:

16) Would you agree that Formula E's sustainability aims are achievable:

- ○ Strongly agree
- ○ Agree
- ○ Impartial
- ○ Disagree
- ○ Strongly Disagree

17) Do you think there is a market for a fully electric racing series:

○ Yes ○ No ○ Maybe

18) Would Formula E influence you to purchase an Electric Vehicle as they are today:

○ Yes ○ No ○ Maybe

19) Why (o):

20) If Formula E can bring changes to electric vFehicle technology would your opinions on Electric Vehicles change:

○ Yes ○ No ○ Maybe

21) Are you aware of the teams/car manufactures that are involved with Formula E?

○ Yes ○ No

22) If yes to question 21, could you list them (o):

Thank you for completing the Questionnaire, the £10 Amazon voucher winner will be selected at random and emailed after the research is completed. If you have any Questions feel free to contact me at robertwebster404@yahoo.com

Appendix 2

Formula E Sustainability Questionnaire

My name is Robert Webster, I am a student at the University of Central Lancashire. This is a dissertation project into Formula E, its sustainability aims and the way it can influence motorsport supporters.

The data collected from this questionnaire will be used for my dissertation, every response is anonymous and all the results will be password protected. An optional email address for a chance to win the £10 Amazon voucher may be included in the answers if you choose.
You must be 18 to participate.

* Required

1. **Gender** *
   Mark only one oval.
   - ◯ Male
   - ◯ Female
   - ◯ Other

2. **Email Adress**

   .....

3. **Nationality** *

   .....

4. **Would you consider purchasing an electric vehicle?** *
   Mark only one oval.
   - ◯ Yes
   - ◯ No
   - ◯ Maybe

5. **Why would you consider/not consider this?**

   .....

   .....

   .....

   .....

   .....

6. **How much does sustainability/climate change concern you on a scale of 1 (not at all) to 5 (highly)?** *
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

General Motorsport Information

7. **Do you follow/support/engage with:** *
Mark all relevant
Check all that apply.

- [ ] Formula 1
- [ ] Other Formula categories (e.g. Formula 3)
- [ ] Any other motor racing series
- [ ] Non of the Above

8. **Do you feel the motor racing industry could be/or is sustainable at present?** *
Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

9. **Does motor sport influence your choice of motor vehicle?** *
Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

Formula E

10. **How intensively do you follow Formula E?** *
Mark only one oval.

- ◯ Very intensively
- ◯ Intensively
- ◯ Casually
- ◯ Very casually
- ◯ Not at all

11. **What are your general impressions of Formula E?**

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The FIA Formula e championship value creation and sustainability report 2013 say that Formula E want to improve commercial electric vehicles, contribute the sale of 77million more electric vehicles, save up to 4billion barrels of oil and avoid 900million tonnes of CO2 over the next 25 years.

12. **General impressions of the statement above?** *

.....

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.....

13. **Would you agree that Formula E's sustainability aims are achievable:** *

Mark only one oval.

- ◯ Strongly agree
- ◯ Agree
- ◯ Impartial
- ◯ Disagree
- ◯ Strongly disagree

14. **Do you think there is a market for a fully electric racing series?** *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

15. **Would Formula E influence you to purchase an electric vehicle as they are today?** *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

16. **Why?**

.....

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.....

17. **If Formula E can bring changes to electric vehicle technology would your opinions on electric vehicles change?** *

Mark only one oval.

- Yes
- No
- Maybe

18. **Are you aware of the teams/car manufacturers that are involved with Formula E?** *

Mark only one oval.

- Yes
- No

19. **If yes to the previous question, could you list them?**

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.....

Thank you for completing the Questionnaire, the £10 Amazon voucher winner will be selected at random and emailed after the research is completed. If you have any Questions feel free to contact me at robertwebster404@yahoo.com

Appendix 3

Formula E Sustainability Questionnaire

My name is Robert Webster, I am a student at the University of Central Lancashire. This is a dissertation project into Formula E, its sustainability aims and the way it can influence motorsport supporters.

The data collected from this questionnaire will be used for my dissertation, every response is anonymous and all the results will be password protected. An optional email address for a chance to win the £10 Amazon voucher may be included in the answers if you choose.
You must be 18 to participate.

* Required

1. **Gender** *
   Mark only one oval.
   - ◯ Male
   - ◯ Female
   - ◯ Other

2. **Age** *
   Mark only one oval.
   - ◯ 18-25
   - ◯ 26-30
   - ◯ 31-40
   - ◯ 41-60
   - ◯ 60+

3. **Email Adress**

   .....

4. **Nationality** *

   .....

5. **Would you consider purchasing an electric vehicle?** *
   Mark only one oval.
   - ◯ Yes
   - ◯ No
   - ◯ Maybe

6. **Why would you consider/not consider this?**

7. **How much does sustainability (e.g. climate change/natural resource depletion) concern you on a scale of 1 (not at all) to 5 (highly)?** *
   Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

General Motorsport Information

8. **Do you follow/support/engage with:** *
   Mark all relevant
   Check all that apply.

- [ ] Formula 1
- [ ] Other Formula categories (e.g. Formula 3)
- [ ] Any other motor racing series
- [ ] Non of the Above

9. **Do you feel the motor racing industry could be/or is sustainable at present?** *
   Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

10. **Does motor sport influence your choice of motor vehicle?** *
    Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

Formula E

11. **How intensively do you follow Formula E?** *
Mark only one oval.

- ◯ Very intensively
- ◯ Intensively
- ◯ Casually
- ◯ Very casually
- ◯ Not at all

12. **What are your general impressions of Formula E?**

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The FIA Formula e championship value creation and sustainability report 2013 say that Formula E want to improve commercial electric vehicles, contribute the sale of 77million more electric vehicles, save up to 4billion barrels of oil and avoid 900million tonnes of CO_2 over the next 25 years.

13. **General impressions of the statement above?** *

.....

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.....

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.....

14. **Would you agree that Formula E's sustainability aims are achievable:** *
Mark only one oval.

- ◯ Strongly agree
- ◯ Agree
- ◯ Impartial
- ◯ Disagree
- ◯ Strongly disagree

15. **Do you think there is a market for a fully electric racing series?** *
Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

16. **Would Formula E influence you to purchase an electric vehicle as they are today?** *
Mark only one oval.

- Yes
- No
- Maybe

17. **Why?**

18. **If Formula E can bring changes to electric vehicle technology would your opinions on electric vehicles change?** *
Mark only one oval.

- Yes
- No
- Maybe

19. **Are you aware of the teams/car manufacturers that are involved with Formula E?** *
Mark only one oval.

- Yes
- No

20. **If yes to the previous question, could you list them?**

Thank you for completing the Questionnaire, the £10 Amazon voucher winner will be selected at random and emailed after the research is completed. If you have any Questions feel free to contact me at robertwebster404@yahoo.com

Appendix 4

respondent	Q1	Q2	Q4	Q5	Q7	Q8
1	Male	41-60	British	No	2	Formula 1, Other Formula categories, Any other motor racing series
2	Male	41-60	British	Yes	3	Formula 1, Any other motor racing series
3	Male	18-25	British	Maybe	3	Formula 1, Any other motor racing series
4	Male	26-30	British	No	4	Other Formula categories, Any other motorracing series
5	Male	31-40	British	No	3	Any other motor racing series
6	Male	31-40	British	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
7	Female	26-30	British	No	3	Formula 1
8	Male	41-60	British	No	4	Formula 1, Other Formula categories, Any other motor racing series
9	Male	41-60	British	No	3	Formula 1, Any other motor racing series
10	Male	18-25	British	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
11	Male	26-30	Irish	Yes	3	Formula 1, Any other motor racing series
12	Male	18-25	Spanish	Yes	5	Formula 1, Any other motor racing series
13	Male	18-25	American	Maybe	3	Formula 1, Other Formula categories, Any other motor racing series
14	Male	18-25	British	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
15	Male	18-25	Argentinian	Yes	3	Formula 1, Other Formula categories, Any other motor racing series
16	Male	18-25	British	Yes	3	Formula 1, Other Formula categories
17	Male	18-25	Brazilian	Maybe	2	Formula 1
18	Male	18-25	American	No	2	Formula 1
19	Male	18-25	British	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
20	Male	18-25	Danish	Maybe	5	Formula 1, Other Formula categories
21	Male	18-25	Australian	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
22	Male	18-25	British	Maybe	4	Formula 1, Other Formula categories, Any other motor racing series
23	Male	18-25	British	Maybe	4	Formula 1, Other Formula categories, Any other motor racing series

24	Male	18-25	British	No	4	Formula 1, Other Formula categories, Any other motor racing series
25	Male	18-25	American	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
26	Male	26-30	Mexican	Yes	4	Formula 1, Other Formula categories
27	Male	26-30	Swedish	Yes	4	Formula 1
28	Male	18-25	British	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
29	Male	26-30	Australian	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
30	Male	18-25	Dutch	Maybe	4	Formula 1, Other Formula categories
31	Male	18-25	British	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
32	Female	18-25	German	Maybe	4	Formula 1, Other Formula categories, Any other motor racing series
33	Male	26-30	American	Yes	2	Formula 1, Any other motor racing series
34	Male	41-60	British	No	4	Formula 1, Any other motor racing series
35	Male	18-25	British	Yes	3	Formula 1, Any other motor racing series
36	Male	18-25	American	No	1	Formula 1, Any other motor racing series
37	Male	31-40	British	No	3	Formula 1, Other Formula categories, Any other motor racing series
38	Male	18-25	Indian	Yes	4	Formula 1
39	Male	18-25	British	Yes	4	Formula 1
40	Male	18-25	American	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
41	Male	18-25	Ukrainian	No	3	Formula 1, Any other motor racing series
42	Male	26-30	Canadian	Yes	3	Formula 1, Other Formula categories, Any other motor racing series
43	Male	31-40	Filipino	Yes	2	Formula 1, Other Formula categories
44	Male	18-25	Portuguese	No	4	Formula 1, Other Formula categories, Any other motor racing series
45	Female	41-60	American	Maybe	3	Formula 1
46	Male	41-60	Danish	Yes	4	Formula 1, Other Formula categories
47	Male	18-25	American	Yes	4	Formula 1, Any other motor racing series
48	Male	26-30	Canadian	Maybe	4	Formula 1
49	Male	18-25	American	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
50	Male	18-25	American	Yes	5	Formula 1, Other Formula categories, Any other motor racing series

51	Male	18-25	British	Yes	3	Formula 1, Other Formula categories
52	Female	18-25	Japan	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
53	Female	31-40	Argentinian	Yes	5	Formula 1
54	Male	31-40	British	No	4	Formula 1, Other Formula categories
55	Male	60+	British	Yes	2	Formula 1, Other Formula categories, Any other motor racing series
56	Male	60+	British	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
57	Male	41-60	British	Yes	5	Non of the above
58	Male	18-25	British	No	4	Formula 1
59	Male	31-40	British	Yes	5	Formula 1
60	Male	26-30	British	Yes	5	Formula 1
61	Male	18-25	British	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
62	Male	26-30	British	Yes	4	Formula 1, Other Formula categories
63	Male	26-30	British	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
64	Male	41-60	British	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
65	Male	18-25	British	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
66	Male	26-30	British	No	4	Formula 1, Other Formula categories, Any other motor racing series
67	Female	60+	British	Maybe	5	Formula 1, Other Formula categories, Any other motor racing series
68	Male	31-40	British	Maybe	4	Formula 1, Other Formula categories, Any other motor racing series
69	Male	18-25	British	No	4	Formula 1, Other Formula categories, Any other motor racing series
70	Male	31-40	British	Maybe	1	Formula 1, Other Formula categories, Any other motor racing series
71	Male	18-25	British	Yes	3	Formula 1, Other Formula categories, Any other motor racing series
72	Male	31-40	British	Yes	1	Formula 1, Other Formula categories, Any other motor racing series
73	Male	41-60	British	Maybe	4	Formula 1, Other Formula categories, Any other motor racing series
74	Male	31-40	British	Yes	3	Formula 1, Any other motor racing series
75	Male	31-40	British	No	1	Formula 1, Any other motor racing series
76	Male	60+	British	No	4	Formula 1, Other Formula categories, Any other motor racing series
77	Male	31-40	British	No	4	Formula 1

78	Male	60+	British	No	1	Formula 1, Other Formula categories, Any other motor racing series
79	Male	60+	British	Maybe	3	Formula 1, Any other motor racing series
80	Male	18-25	British	Yes	5	Formula 1, Other Formula categories, Any other motor racing series
81	Male	31-40	British	Yes	3	Formula 1, Other Formula categories, Any other motor racing series
82	Male	26-30	British	Yes	4	Formula 1, Other Formula categories, Any other motor racing series
83	Male	26-30	British	No	2	Formula 1
84	Female	41-60	British	Maybe	4	Formula 1, Other Formula categories, Any other motor racing series
85	Male	26-30	British	Yes	2	Formula 1, Other Formula categories, Any other motor racing series
86	Female	18-25	Irish	No	3	Other Formula categories, Any other motor racing series
87	Male	41-60	British	Maybe	3	Formula 1, Any other motor racing series
88	Male	31-40	British	No	1	Formula 1, Other Formula categories, Any other motor racing series
89	Female	31-40	British	Yes	4	Formula 1, Other Formula categories
90	Male	26-30	British	Yes	3	Formula 1, Other Formula categories, Any other motor racing series
91	Male	41-60	British	Yes	4	Formula 1, Other Formula categories
92	Female	41-60	British	Maybe	3	Formula 1

respondent	Q9	Q10	Q11	Q14	Q15	Q16	Q18	Q19
1	Yes	No	Not at all	Impartial	Maybe	No	Yes	No
2	Yes	Yes	Very casually	Impartial	Yes	No	Yes	No
3	Yes	No	Casually	Impartial	Yes	No	Yes	No
4	Yes	Yes	Very casually	Agree	Maybe	No	Maybe	Yes
5	Maybe	Yes	Not at all	Disagree	Yes	No	Maybe	No
6	Maybe	Yes	Very casually	Disagree	Yes	No	Yes	No
7	No	No	Very casually	Agree	Yes	No	Yes	No
8	No	No	Casually	Strongly disagree	Yes	No	Yes	Yes
9	No	No	Not at all	Impartial	No	No	Yes	No
10	No	Maybe	Casually	Agree	Yes	Maybe	Maybe	Yes
11	Maybe	No	Intensively	Agree	Yes	Maybe	No	Yes

12	No	No	Very casually	Agree	Yes	Maybe	Yes	No
13	Yes	Maybe	Intensively	Agree	Yes	Maybe	Yes	Yes
14	Yes	Yes	Intensively	Disagree	Yes	Yes	Yes	Yes
15	Yes	Maybe	Casually	Strongly agree	Yes	Yes	Yes	Yes
16	Yes	No	Very Intensively	Disagree	Yes	No	Yes	Yes
17	No	Yes	Casually	Agree	Maybe	No	Yes	Yes
18	Yes	Yes	Casually	Agree	Yes	Maybe	Yes	Yes
19	Yes	Yes	Very Intensively	Strongly agree	Yes	Yes	Yes	Yes
20	Yes	Maybe	Casually	Agree	Yes	Maybe	Maybe	Yes
21	Yes	Yes	Very Intensively	Agree	Yes	No	Yes	Yes
22	Maybe	No	Casually	Agree	Yes	Maybe	Maybe	Yes
23	Maybe	Maybe	Intensively	Impartial	Yes	No	Yes	Yes
24	No	Maybe	Intensively	Agree	Yes	No	Maybe	Yes
25	Yes	Yes	Very casually	Strongly agree	Yes	Yes	Yes	No
26	Yes	Maybe	Casually	Agree	Yes	Maybe	Yes	Yes
27	Maybe	No	Intensively	Impartial	Yes	Maybe	Yes	Yes
28	Maybe	Yes	Very Intensively	Agree	Yes	Maybe	Maybe	Yes
29	No	No	Intensively	Agree	Yes	Maybe	Yes	Yes
30	No	No	Intensively	Impartial	Yes	No	Yes	Yes
31	Yes	Maybe	Casually	Agree	Yes	No	Yes	Yes
32	No	No	Casually	Agree	Yes	Maybe	Maybe	Yes
33	No	No	Intensively	Impartial	Yes	No	Yes	Yes
34	Yes	No	Casually	Impartial	Maybe	No	Maybe	Yes
35	Maybe	Yes	Casually	Strongly agree	Yes	No	Yes	Yes
36	Yes	No	Not at all	Impartial	Yes	No	Maybe	No
37	Maybe	No	Casually	Disagree	Yes	No	Maybe	Yes
38	Yes	Yes	Casually	Agree	Maybe	Yes	Yes	Yes

39	Yes	Yes	Not at all	Agree	Maybe	No	Yes	No
40	Yes	Yes	Very Intensively	Strongly agree	Yes	Maybe	Yes	Yes
41	No	Maybe	Casually	Impartial	Yes	No	Maybe	No
42	Maybe	No	Very Intensively	Agree	Yes	Maybe	No	Yes
43	Maybe	Yes	Very Intensively	Impartial	Yes	No	Maybe	Yes
44	Yes	Yes	Intensively	Strongly agree	Maybe	Maybe	Maybe	Yes
45	No	Maybe	Very casually	Impartial	Maybe	No	Yes	No
46	Maybe	Maybe	Casually	Agree	Yes	No	Maybe	Yes
47	Yes	Yes	Casually	Strongly agree	Yes	No	Yes	Yes
48	Yes	Maybe	Intensively	Agree	Yes	Maybe	Maybe	Yes
49	Maybe	Yes	Very Intensively	Agree	Yes	No	Yes	Yes
50	Yes	Yes	Casually	Strongly agree	Yes	Maybe	Yes	No
51	No	Yes	Casually	Agree	Yes	No	Yes	No
52	No	No	Very casually	Strongly disagree	Yes	No	Yes	Yes
53	Maybe	Maybe	Intensively	Agree	Yes	Maybe	Yes	Yes
54	No	No	Casually	Agree	Yes	No	Yes	Yes
55	Maybe	Yes	Very Intensively	Impartial	Yes	Yes	Yes	Yes
56	Yes	No	Intensively	Agree	Yes	Maybe	Yes	Yes
57	No	No	Intensively	Strongly agree	Yes	No	Yes	Yes
58	Yes	No	Very casually	Agree	Maybe	Yes	Yes	Yes
59	No	No	Intensively	Agree	Yes	Maybe	Yes	No
60	No	No	Not at all	Agree	Yes	Yes	Yes	Yes
61	No	Yes	Very Intensively	Agree	Yes	No	Yes	Yes
62	No	No	Very Intensively	Agree	Yes	Yes	Yes	Yes
63	No	No	Intensively	Impartial	Yes	Maybe	Yes	Yes
64	Yes	No	Intensively	Impartial	Yes	No	Yes	Yes
65	Yes	No	Very Intensively	Agree	Yes	Maybe	Yes	Yes

66	Maybe	No	Casually	Impartial	Yes	No	Yes	Yes
67	No	No	Casually	Impartial	Yes	No	Yes	No
68	Maybe	Yes	Intensively	Strongly agree	Yes	Yes	Yes	Yes
69	No	No	Intensively	Disagree	Yes	No	Maybe	Yes
70	Maybe	No	Very casually	Disagree	Yes	No	Yes	No
71	Yes	No	Intensively	Agree	Yes	No	Yes	Yes
72	Yes	No	Not at all	Agree	Maybe	No	No	No
73	Yes	No	Intensively	Impartial	Yes	Maybe	Yes	No
74	Yes	Yes	Very casually	Impartial	Yes	No	Yes	No
75	Yes	No	Intensively	Agree	Yes	No	Yes	Yes
76	Yes	No	Very casually	Disagree	Maybe	No	Yes	No
77	Maybe	No	Very casually	Disagree	Maybe	No	Maybe	No
78	Yes	No	Casually	Disagree	Yes	No	No	No
79	Yes	No	Casually	Disagree	Yes	No	Yes	Yes
80	Maybe	Yes	Very Intensively	Agree	Yes	Yes	Yes	Yes
81	Yes	No	Casually	Disagree	Yes	No	Yes	Yes
82	Yes	No	Very casually	Disagree	Yes	No	Yes	Yes
83	No	No	Very casually	Disagree	No	No	Yes	No
84	Yes	Yes	Very Intensively	Agree	Yes	No	Yes	Yes
85	Yes	Yes	Casually	Agree	Yes	No	Yes	No
86	Yes	Yes	Intensively	Agree	Yes	No	Yes	Yes
87	Yes	No	Casually	Disagree	Yes	No	Yes	Yes
88	No	Yes	Very casually	Strongly disagree	No	No	Maybe	No
89	Maybe	No	Very casually	Agree	Yes	No	Yes	Yes
90	No	No	Casually	Agree	Yes	No	Yes	No
91	Yes	Yes	Intensively	Agree	Yes	Yes	Yes	Yes
92	Yes	Yes	Casually	Strongly disagree	Yes	No	Yes	No

Appendix 5

Respondent= R

R	Q6	Q12	Q13	Q17	Q20
1	Range is too low	NA	This is improvable	Racing doesn't effect the car I buy	NA
2	I would be even more likely to purchase when the range has increased	I thought it was entertaining	A good thing if they can achieve it		
3	The vehicles are more economical, and there are more charging ports	It was quite exciting, and I like the look of the cars	I think that's brilliant, a good goal	Not sure yet, too many draw backs at present	
4	The lack of petrol, no engine noise	The racing is good, there isn't any noise and that kills the atmosphere	Always a good thing		Renault
5	All electric cars do is shift carbon production from the internal combustion engine to power plants		I don't believe this is possible	The charging times are a major issue	
6	Fuel saving costs, its cool to be different	The lack of noise is an issue, ill be more convinced when the cars are more powerful	Not too keen	The technology just isn't ready yet, and I am a petrol head	
7	There isn't enough range	The racing is really close, its both exciting and good for the environment	Great if it can be done	The cars seen on the racing track are not the ones the public will purchase	
8	Range is too low, maybe a possibility in a city	I don't like the lack of sound, however there are good drivers and racing	How could this be implemented?	Still issues with the lack of range	Virgin
9	The vehicles are too expensive, the range is too low		Wont make any difference on a global scale	Racing may not affect the cost of vehicles, range may remain an issue	
10	If the range was reasonable and the price (including running costs) was below a comparable petrol car then I would consider an electric vehicle.	It looks interesting, but has yet to capture the magic I feel when watching F1 or MotoGP	I would say Formula E is good for pushing better electric technology for cars and in general promoting electric vehicles.	It brings electric vehicles more to the forefront of my mind and encourages me that progress is being made in them.	e.DAMS, Mahindra, Dragon
11	Potential reduction in maintenance and running costs.	Good, however it will become more interesting when car development begins	Interesting.	it will depend on what manufactures enter the sport and what technology trickles down to road car development.	While there are teams and car company related teams, it is a spec series so the manufacture does not currently matter.

12	Fossil fuels becoming increasingly more expensive and less abundant. Battery technology improving really fast makes electric cars a viable option		Probably wont result in such big numbers, but is something that will help people realize how important electric vehicles will be in a short future		
13	I enjoy driver cars focused mostly on the driving experiance not cars where the focus is on comfort/praticality/economy. Which is where nearly all affordable electric cars are at the moment.	I love the concept electric cars with a focus on performance, and racing is the prefect place to showcase and push the boundaries of current technology. I also love how the relative low speeds reduce the aero wash that all too often keeps formula cars from racing closely. The fan boost Idea can be done away with, and I think some of the circuits are too tight and different layouts might promote better racing. Those are my only concerns.	I think this statement is mostly correct the 77 million number may be high but other than that it sounds solid.	again I want an affordable electric car that focus on the driving experience which currently does not exist.	audi, renault, mahindra,peguet.
14	Its good.	could be faster, but i'm sure that'll happen eventually	yeah we'll see	why not	citroen, renault, there's loads fam
15	Moving away from liquid fuel to conserve money and for environmental friendliness.	Great idea, love the racing but would really like to see tracks that aren't as bland as they are. The speed of the cars are greatly masked (for the better) by the narrowness of the track but I don't like the monotony of the corners.	I believe FE has a huge potential in advancing electric vehicles in the way of battery storage and usage. I also think that it is important to at least attempt to lower fuel emissions in the following years and reduce dependence on liquid fuel.	It's relatable and now gives a sense of speed and race to it. I think a lot of people look at electric vehicles and think of them as being boring and unexciting but with a race series, a different view of it is opened, as it can now be seen as racy and sleek.	I don't know the manufacturers but I only know a few of the teams: ABT E-dams Renault Dragon Racing Venturi Racing
16	I would consider it since they are cheaper to run and I know the location of some charging spots, but not in the near future.	I am a big fan so far	It's a strong statement, but I believe Formula E will be able to accomplish something along these lines, though perhaps not as much as they say	The two-car system highlights a problem with battery life	e-dams, China racing, dragon racing, Trulli gp, Abt
17	Cost, speed	Too much social media involved	It probably is helping at the technology of	Speed, bad car's design	Virgin, audi, Renault

		(driver fan boost ie), slow cars, place where ex-f1 drivers go	eletric cars		
18	I do not like the current issues with battery drain rate and limited range.	My feelings on battery powered cars are only reaffirmed when I watch Formula E. When you watch a Formula E race half way thru they have to pit to switch car because of the battery drain. I enjoy the series, albeit I do no watch every race, but they need to boost the battery/tech to make the battery performance where it can match a internal combustion engine. It is kinda of lame to see Piquet jump out of one car and into another mid-race.	Great! They just have to fund battery development and research like F! does with engines in order to get the reliability and range increased.	Currently, No. However, in the coming years if they can develop longer between charge batteries and it is proven on the track I might	Teams: Audi ABT, E-Dams, Dragon Racing, Andretti, Virgin, Amlin Aguri. Drivers: Prost, Piquet, JEV, Buemi, Senna, Abt, Speed, Pic, Trulli.
19	It i the future of technology and it would be nice to be doing my part for the environment.	i love the general atmosphere around all of the formula e races. the cars are technologically advanced and i love the passion that the drivers have for the sport. absolutely fantastic!	I think that the formula initiative is fantastic and and the cause is great!	Formula E would definitely influence my vehicle choice because of the strong link between the pursuit of being the 'best' technologically. The different array of constructors would definitely influence my choice!	virgin trulli venturi e-dams mahindra audi nextev dragon aguri Andretti
20	Environment, but it is too expensive in Denmark right now, especially when being a student.	Good racing and I like the idea. I think the future is bright for Formula E, and it will be very interesting when it is no longer a spec car.	I definitely think a lot more electric cars will be sold in the future when the price goes down a little. I'm not sure how much Formula E contributes however, at least not here in Denmark. E.g. I don't personally know anyone else who watches FE.	Still too expensive, otherwise I like the idea.	Renault made the car, if I recall correctly.
21	Produces zero emmisions if the electricity is in a renewal way.	Its has had and exciting start and will be interesting to see how development goes.	I hope they but need to first enprove how we create electricity	Charging time plus battery capacity	Renault venturi abt dragon virgin truli andretti minhindra
22	just as much as an option as a non-electric vehicle	the racing is fun, it will be exciting to see how the cars evolve over the next few years	positive	depends on what is cheaper but it is an option	Renault, Abt, Andretti, Virgin, edams, amlin aguri, mahindra, trulli, venturi,

					dragon racing, team china,
23	If they were cheap and practical.	Good racing, interesting to see the technology get better, the grid seems to be full of ex f1 drivers	good, but electrics aren't everything WEC are making bigger gains in hybrid tech, the series needs to start allowing competitive development on the PU's which will attract engineers and fans etc..		Audi, Renault, BMW running safety car
24			Formula E would need to be far more popular to attempt to achieve this. At present, with the car change, it is also more a showcase of how electricity is not viable for anybody travelling long distances		Prost, Abt (Audi), Venturi, Virgin, Amlin Aguri, Andretti, Dragon, E-dams Renault, Trulli, somebody else McLaren motor, Williams battery, Dallara chassis. Renault have some influence into manufacture.
25		Awesome!	Amazing		
26	Fuel Economy, Overall Ecologic Welfare	Good idea, might need a few seasons to turn into something that is magnificent, have a lot of quirks and issues right now, but overall i am satisfied for it being the first season.	This is great, and good to hear, most improvements that get lost in beaurocratic processes all over the world could easily be pushed forward by "big" business companies, and im happy to hear that they have this in mind, while advancing and profiting for their companies.	Cost.	Andretti Trulli Virgin Audi Venturi
27		Crazy races!	sound good		
28	With recent advancements and technical partnerships (For example, Qualcomm and Williams, Tesla Motors and everyone!) the engineering potential has reached a level which I would consider investing in to.	Purely on a motorsport basis, I think it's been a very conservative approach. I think things could have been slightly more aggressive in terms of power delivery, and over-boost. I think you also need to consider the pitstop regime. Even a replacement battery system would be cheaper than a second car, and the viewer feels robbed if someone can get away with a free mistake. On the	Like I mentioned above, with Qualcomm and Williams etc I can see how you can start to achieve this. I think the actual power train systems need to be addressed first. A motor and a battery is not exactly 21st century technology is it. We can do so much better. In fact, even I could think of ways to do this better!	Tesla now have a serious option to 'normal' luxury transport now, so yes. But a Nissan Leaf, or a Prius.. no. For a start you can talk about fuel saving and sustainability all day, but the fact remains recycling a big lump of a battery or 'power cells' is in no way environmental at all.	I'd say the most prevalent is probably Renault, on a pure advertising basis. Especially after Prost Jr's last lap of the first race. But other than that, Qualcomm have gained massive exposure, for the viewer at least.

		other hand, the all weather tyres are the way forward. I would also like to say going with a geared system was the right way to go. Especially with lower speed, and no engine sound. From a technological perspective, I think it's also been way too conservative. I'm looking forward to it not being a spec series, and some design variations. At the autosport show this year I was looking at the Formula E car on display, and close up, I have to say I wasn't particularly impressed with design choices. As an engineer, I feel slightly robbed of technology which could have been used, and made the sport more interesting on many levels. I can see you've tried to make this appeal to younger audiences, but I don't quite see why you've made it so tacky with the 'formula e-j' dj guy and crappy music and stuff.. the kids want it to be professional and well polished, not tacky and childlike. If you SERIOULSY want to be considered as a viable alternative to other top flight motorsports you need to make the whole show more professional, with more detail and 'wow factor'. That's what you're missing, and how you can take this to the next level.			

29	environmental reason	I'm liking it, i though i wouldnt...	Sounds like a start	electric doesn't work well in australia, distance is too high	e-dams, dragon, audi, trulli, venturi. off the top of my head. oh and china racing
30	Eco friendly on one hand, but misses a lot of what traditionally is part of a car: a noise-making engine.	Very fun, a lot of good racing. Not so sure about the car performance though.	It's an honourable goal, but I think that it may be a bit optimistic. Even so, it may be a cause worth fighting for.	I can see for myself that if in a racing car, fully electric drivetrains can work, it can work well in road cars. As of this moment though, there is the matter of changing cars in Formula E, so they're not quite there IMO.	Renault, Dallara, McLaren, Michelin
31	Less pollution and a lot more sustainable once the charging source uses power generated from renewables.	Seems like it has potential to improve the development of electric cars once it grows and manufacturers join.	That seems kind of difficult to quantify. I would not be concerned with Formula e helping to sell more electric cars directly, personally I think the incentive to push technology development in this area is much more important at the moment. The cars sales will naturally follow from that.	Formula e has not increased my awareness of electric vehicles in any way and in my opinion has only served to emphasize the notion that battery technology is not quite where it needs to be. That being said, expecting Formula e to have this kind of influence at this stage would be unrealistic and I am excited to see what the series can achieve given time.	I did know at the start of the season but admittedly lost interest because the circuits were quite boring and so have now forgotten the teams involved since I haven't been watching.
32		Definitely has some potantial to become as big as other motor sport categories. Lacks some speed. Looking forward to next year when they can modify the cars.	Whatever idea that could prevent the climate change to be too dramatic. they should try to achieve it, but 77 million seems a bit optimistic.		abt, andretti, mahindra, venturi, virgin, renault, amlim
33	For daily driving around town an electric pickup truck capable of driving around 200 miles on a charge would suit my needs perfectly. not having to refuel could potentially save me $200 a month plus time	Close racing with unpredictable winners. Personally I love the development race of formula 1 and I am hoping plans to introduce development in formula e go forward. in all honesty, the pit stops are a bit gimmicky, but I understand the need for it with current battery tech. Over all, I enjoy the racing	The FIA needs to evaluate the actual environmental impact of electric vehicles before spouting off propaganda designed to cash in on a fad. Formula E contributes to tonnes of CO2 by hauling hazardous cargo worldwide. Producing 77 million electric vehicles and the 77 million lithium batteries to power them could very well harm the environment more than burning 4 billion barrels of oil. In	current electric vehicles are not designed to cater to my needs	audi, edams rennaut, andretti, trulli, virgin, and some more

		and make sure to see every race	addition, the majority of the energy used to charge the electric batteries will come from fossil fuels ultimately. Promote the close racing, the technology and it's associated high torque, and the skilled drivers but leave the propaganda out of it		
34	At present i would noy buy an electric car because i think that the carbon footprint of manufacturing such vehicles, and of the production of the electricity used to power them, is not sufficiently considered when governments / manufactures are quoting facts an figures.	You cannot get away from the fact that the lack of engine noise is a significant negative problem. Worst of all are the gimmicks such as fan boost.	I find the statement unbelievable and doubt that it can be proven. I think that motorsport in general can create brand loyalty amongst some fans, however as the range of electric vehicles available is relatively small I think that it does not happen with Formula E. Additionally the majority of the current range of electric cars available are not sporty or desirable due to their dull or needlessly quirky design	I don't see any connection between the sport and road cars, for the sport to be relevant road car manufactures would have to be involved in a significant way	
35	Cheaper to run/ Reliablity.	It's alright, fan boost is dumb. Also having to swap cars mid race is dumb. Just shows to the world that electric cars are not ready for the main stream yet. Which Tesla have shown is not the case.	Then get some cars that can go a full race distance!	Range issues.	Virgin, Mahindra, Venturi, Andretti, Aguri.
36	No clue how to fix it.	Not a big fan. I watched one race but could not get into it. The cars looked almost fake and the whole switching cars halfway through is weird to me. In formula 1 the car is a main focus and if the can't make it an entire gp then they don't score any points.	The statement above has shifted my opinion about formula e. I think the world could be a better place with out oil in charge.	I don't know how to fix and electric vehicle.	
37	Charging stations are still relatively scarce and the range too low	It seems a little gimmicky at the moment and everyone having to change car mid race is awful. It needs to sort this	It's admirable but I don't think the events do enough to sell electric cars. If anything it reinforces the negative images of them	It hasn't dispelled the perceived issues with the charging	

		and be less gimmick driven. Also when you get situations like Monaco where the course has to be changed to make it viable but that means sending them down a backroad that isnt really suitable especially on the first lap just makes it look like amateur hour			
38			I feel electronic/hybrid vehicles are the next big things , the way we use oil we would be running out of it pretty soon , and the amount of pollution the cars create is so much that it is very alarming. I feel we should all switch to hybrid vehicles		Audi, Mahindra Racing , Virgin Racing , Nextev
39	It's the future.	In its early stages.	Sounds like a very good statement.	The range is too low.	
40	Cheaper alternative to gas powered.	An incredible task being taken on by the FIA. No other starting series has captured the attention of so many people, or has had hundreds of cities take notice to bid for spots so often.	If we are able to decrease the amount of fossil fuels, by any means, it is a path to be explored. With this being in the for of motorsports, we're having fun with it as well.	The technology is not quite at levels to sustain my levels of expectations of a car. (I drive a truck, and load it a lot.)	Renualt. The rumored Tesla. Andretti. Dragon. ABT. China. Virgin. Trulli.
41	Total lack of infrastructure necessary to own and run an electric vehicle. No charging stations, service centers. Plus I still find it hard to believe that battery technology is ready for fully electric cars.	An interesting racing series. While the cars themselves are quite slow and the batteries run dry extremely fast, the racing produced has consistently been on a good level. The bad thing about FE is that it is currently a spec series, which is certainly not the way to go forward. There need to be manufacturers in the sport to actually make a difference, not just racing teams.	Seems a bit too ambitious.	Until battery tech gets good enough that electric cars can match petrol cars in cruising range, electric cars will be limited to highly urban environments. While interesting, at this point in time an electric car can not in any way overcome cars running on fossil fuels. Although a hybrid car may make the best of both worlds.	
42	Currently	Fun races to watch,	Interesting statement,	I already wanted to	e.Dams

	electricity is cheaper the petrol. operating cost is lower.	though need to increase battery life or use fuel cells to get 1 car a full race distance.	would like to see the source and how the figures are determined.	purchase an electric vehicle before Formula E.	Virgin racing Mahindra ABT Dragon Racing Andretti
43	Total cost of ownership	Interesting. Curious about next season when the innovations happen	if everyone switches to electric, CO2 producing plants will be needed to cope with the increased energy demand	too expensive	mahindra renault audi
44	I would rather buy a hybrid. best of both worlds.	boring sound and low overtakes.	thats awesome but this is what exactly we need to do. both type of races , electric and hybrid	Not my style	amlin aguri , andretti , audi sport abt , nextev tcr, dragon racing, e.dams-renault, mahindra racing, trulli, venturi, virgin racing.
45	The pollution involved in manufacture and later disposal of the batteries is extremely concerning. Not convinced this technology is a viable replacement to carbon fuels. Maybe, but not any time soon.	It's an interesting and worthwhile experiment. Frankly I don't follow it closely enough to appreciate the sporting value of the series, but I do appreciate the engineering competition aspect.	Positive? Anything that leads to the kind of innovations that would result in those kind of statistics is good, but it remains to be seen how realistic those goals are.	I'm mildly interested in hybrid electric vehicles, but full electrics are not anywhere near what I'd feel comfortable buying from either a value or ecological perspective at present. Formula E has no bearing on my opinions of current day electric vehicles.	
46	Silent, easy, cheaper. Perfect for transport	50% faster (at least) + slicks and you have me. I dont mind the silence, but you can't have names like Prost and Senna karting around at 70kmh. I see A LOT of potential.	Motor sport is not about saving the rainforrest. Daily routines are. It's like asking Ronaldo to run slower, not to wear out the grass. Two completely different things. Motorhomes, partnerships (Shell, Marlboro +++) now there's a possibility to set a good example. But I wouldn't count on it.	day to day vehicle : transport Formula E : sports Set the standard by your actions. Not just the engine settings.	Virgin, ABT, Renault, Andretti
47	Electric vehicles have been making rather large progressions in the last decade, but improvements are needed. The range of a vehicle's travel distance per charge needs to be improved upon for more of a global	Formula E is the way of the future of motorsport, but needs to target a larger audience. Changes to rules and and appearance can bring in more people into the sport. It currently shares the same problem with Formula 1 with the unpleasant(quiet) engine noises.	The advances in Formula E is the way of the future and is an example of how motorsport should move towards but still needs to bring appeal. Saving oil is necessary and this is the way to do it.	A form of renewable energy is also necessary in order to help travel farther and consumer less battery life. Main concern is weight of the car needs to decrease and more electrical power. Formula E has shown that electric racing is possible and can definitely be exciting. Advances in technology is	E. Dams Venturi Trulli Virgin Audi Aguri Dragon China

	consumer use. A form of renewable energy is also necessary in order to help travel farther and consumer less battery life. Main concern is weight of the car needs to decrease and more electrical power. Formula E has shown that electric racing is possible and can definitely be exciting. Advances in technology is especially reliability and performance must make larger strides.	Motor racing needs to have the noise behind it in order to make the sport more appealing.		especially reliability and performance must make larger strides.	
48	1. Current prices are beyond my means. 2. Don't they mine the materials in China, send them to Brazil to be processed, back to China to be installed, and back over here to be sold, or something like that? Aren't the large tanker/cargo ships one of the largest polluters out there?	You have to be fair that it's their first season, and hope as the tech improves they can go faster and longer. Some of the courses can be a bit too tight (most of them) and/or look rather dull aesthetically (i.e. Berlin). I believe the fan boost should allow you to "pick 3" rather than one.	Excellent.	It's cool that there are lots of different teams, but isn't Audi the only global car maker there? Audi is expensive. If other teams are related, I wouldn't know from having solely watched race coverage this season, (and one or two qualy's.)	Audi APT/ABT whatever. Next EV Trulli's team Renault Virgin
49	I would consider it now if I lived in a city center and drove only a few miles. I don't live in a city now so thats not an option. However, if charging stations became more ubiquitous and accessible I would get one now.	Good racing now but it will only get better once the rules are relaxed, more manufacturers get involved and more sponsors come in. The single day running and lack of proper TV coverage across the pond does make it more difficult to follow.	Marketing hogwash regarding CO2. Let's face it. This is a series designed to sell cars, albeit electric ones. And as a byproduct of that CO2 will be saved. Hooray.	Unless Tesla gets in the game, there aren't any electric cars made by any of the sponsors in Formula E that I'd want to own. They all are like econoboxes with a crate of 9v batteries in the boot. Only the Tesla at the moment seems appealing.	NextGenEV Renault Spark Mahindra
50	If it fit my commute to	Could use adjustments (cut	Formula E wants to play a large part in	I think the technology needs to advance	

	work and allowed me to save net between the reduced fuel cost and the increased power bill.	out fan boost, etc.) But bad been surprisingly good with extremely good racing so far.	advancing the publics perception of electric vehicles as well as move the technology forward.	more but the basis is there.	
51	they could be much cheaper to run in the future than conventional vehicles today	I think that the racing is interesting and is a viable alternative to normal motor sport	it could be achievable in the long term	the technology isn't developed enough yet.	
52	Social responsibility, the availability of good electric cars like the Tesla Model S	It is still very much in it's technological and sporting infancy. I'd consider following it more closely in a few years when it has had a chance to mature.	The intention seems like a gimmick and also does not seem realistic or true. Any world-exploring racing series is going to use an enormous amount of energy to move it's whole circus around.	There hasn't been enough time for the technology (if someone were to view it favorably) to possibly be directly contributing to road cars, influencing me to want one.	Trulli, Venturi, China, Mahindra, Aguri, Dams, Andretti Renault, Audi
53	I would consider it because I think it's very important we change our minds towards renewable energies and start getting conscious about alternative, greener fuels to power our cars	It exceeded my expectations. I think it has great potential for innovation in renewable energies technology, and it's a great way to bring those new technologies to the public through entertainment.	It's an ambicious goal, but I think it will be worth it. I think Formula E will help not only to improve electric cars technology but also to challenge the public's preconceptions about electric cars.		McLaren is involved in developing engines. And Williams is involved in developing batteries. Renault is in charge of the design of the cars. Teams: Trulli, Andretti, Aguri, Venturi, Virgin, Mahindra, Dragon, ABT, eDams.
54	Lack of performance, to expensive to buy. As I live in rural Wales there is a lack of charging points	The racing was good, but, the series was not advertised enough	It's a big statement, it will push technology forward	Lack of performance, and I live in the country side.	Renault, Audi-ABT, BMW support vehicles.
55	Because that is where technology is going, better economy	Good racing, an interesting concept and a good alternative to other motorsports	This doesn't really bother me	Increased publicity, improves the image of EVs making them look attractive	Audi-ABT, Virgin, Mahindra
56	I only travel short distances so the milage issues don't bother me	Very enjoyable, much better than Formula 1	It's a nice idea, a good concept	There is a good transfer of technology from FE racing to road cars	Virgin, DHL, Prost
57	Better fuel economy, eco friendly	Really enjoyable, good racing and close constructers competition	Could be achieved as long as there is a raised profile of FE		Audi-Abt, Virgin, e-dams Renault, Nextev,, Mahindra, Trulli
58		It was enjoyable	This is how it should be		Venturi, amlin, Audi-ABT, Andretti,

					Mahindra
59	Although I would purchase one there isn't enough range and there is difficulty charging	Not enough publicity	Its very optimistic, not enough momentum built up yet		
60	Eco friendly and sustainable	I like the noise	This can only be a positive aim		Audi-ABT, Renault
61	Environmentally friendly, I enjoy new tech	I was surprised at the car performance, all of the cars were reliable giving off a good EV image	Its certainly a possibility	The technology just isn't quite here yet	Citroën virgin, Audi-ABT, Nextev
62	This is the future for car technology	It was brilliant, highlights everything that is wrong with Formula 1	This is an impressive statement	FE is creating cars that hold charge longer and are more usable	DS Virgin, Audi-ABT, Nextev, Mahindra, E-dams Renault, Trulli, Venturi, Dragon, Andretti
63	Too save money on fuel, better and cleaner technology	It was good, could improve with event organization	If this is fact it would be great, but these figures are produced by the FIA themselves		Mclaren, Williams as suppliers. E-dams Renault and Mahindra
64	I don't travel far	It was Brilliant	This is a big target	The technology isn't there yet, and the cars are too expensive at the moment	Mahindra, Prost
65	The cars are cheap to run, they are the future	I liked it, the series was really open to the fans	This is a really bold statement, proving that EVs arnt boring	The cars are quite fast, but there still is a problem of high purchase prices	Virgin
66	Lack of range	It was quite good	This is possible, but the sport needs a higher profile		Aguri
67	Really green, investing in the future	It was ok	This is an excellent aim		
68	Good value for money when compared to fuel costs	Fairly good, excellent racing	This is really positive	Its more responsible to own an electric car	Dragon, ventrui
69	The range is too short, the cars are too expensive and there isn't enough charging points	There was some good racing, it was very unpredictable	I don't feel believe this		Venturi, Aguri, Audi-abt
70	Maybe if it is cost effective	Lack of sound was disappointing	I don't believe this is possible	The technology isn't advanced enough yet	
71	Its more cost effective	It was exciting, good racing and was unpredictable, lots of talented drivers involved.	It's a good idea, but awareness of the sport needs to be raised first		Edams Renault
72	There are some good quality vehicles about, especially from	Lack of noise is an issue, but F1 is going that way anyway	This concept is false, oil isn't even that scarce and oil prices are low atm		

	BMW				
73	The technology is a long way of being perfect yet, but it is more sustainable	It had good close racing	This is good for the environment	The technology just isn't ready yet	
74	Saving money		Optimistic future		
75	Its just not viable to own one, too expensive to purchase	I was impressed, great racing, quality drivers	I hope they can do this, they will be able to find a way		Trulli, Prost, Virgin, Audi-ABT, E-dams Renault
76	I prefer petrol cars	Seems good	No chance of this being achieved		
77	Lack of availability of recharging, short battery life		Very optimistic		
78	Because I don't need another vehicle	It was quiet, but the racing was good	This doesn't worry me	Electric Vehicles just don't appeal to me	
79	Cost saving, good for the environment	It was ok, on the whole quite good	This is ambitious	There are practicality issues at the moment	Prost
80	Cleaner energy	Brilliant, really exciting	This is ambitious, but achievable		E-dama Renault, Virgin racing, Mahindra
81	Better economy	Its very niche, attracts only a certain type of supporter	Id be surprised if this is achieved	Technology not advanced enough, not enough range	Vergne
82	I would as long as the cars are fun to drive	It was fun and interesting, but other racing series take priority over Formula E for me	I don't think this is achievable, the vehicles seen on the track are not the ones on the road	The vehicles displayed in Formula E are not represented of the ones available to purchase today.	Virgin
83	I don't feel the technology is here yet	It was quiet, good talent about though	This is of no interest to me		
84	Inevitable that technology is moving this way	It was brilliant and I was very impressed	If they can do this its good, given the right conditions it can be done. But Formula E needs to change the publics perception of electric vehicles	The technology just isn't here yet	Dragon racing, Virgin, Trulli
85	The BNW i8 and i3 are cool	It wasn't too bad, good action	Pretty impressive	I just prefer petrol engines	
86	Technology isn't advanced enough yet	It was an impressive start	This is a very ambitious aim		
87	It's the range of the vehicles that limits me, and the lack of charging infrastructure	It was OK	I think this will help the sales of cars, but this doesn't explain how the weak infrastructure will be changed		Virgin
88	I just prefer petrol power		I totally disagree with the vability of this		
89	Some electric vehicles are now cool (eg Tesla), and for environmental reasons		If this is true then its impressive	Manufacturers need to create a link between race cars and road cars	E-dams Renault

90	The cars are more economical and better for the environment		This statement is great, if true	Formula E isn't the reason I am originally interested in Electric Vehicles	
91	More economical, charge time and battery life are now improving		It's a good idea		
92	Im just not sold on the whole concept yet	It was alright, not enough noise or speed yet though	This is unachievable in my opinion		

Appendix 6

Table 1: Cross-tabular table of question 2 and 5.

Age	Yes	No	Maybe	Total
18-25	23	8	8	39
26-30	12	4	1	17
31-40	8	6	2	16
41-60	5	4	5	14
60+	2	2	2	6

Table 2: Cross-tabular table of question 2 and 7.

Age	1	2	3	4	5	Total
18-25	1	2	9	17	10	39
26-30	0	3	4	7	3	17
31-40	4	1	4	5	2	16
41-60	0	1	5	7	1	14
60+	1	1	1	2	1	6

Table 3: Cross-tabular table of question 2 and 9.

Age	Yes	No	Maybe	Total
18-25	22	11	6	39
26-30	5	8	4	17
31-40	4	3	9	16
41-60	9	4	1	14
60+	4	1	1	6

Table 4: Cross-tabular table of question 2 and 10.

Age	Yes	No	Maybe	Total
18-25	19	12	8	39
26-30	2	13	2	17
31-40	6	9	1	16
41-60	5	7	2	14
60+	1	5	0	6

Table 5: Cross-tabular table of question 2 and 11.

Age	Not at all	Very Casually	Casually	Intensely	Very Intensely	Total
18-25	2	4	15	9	9	39
26-30	1	4	4	6	2	17
31-40	2	6	3	4	1	16
41-60	2	2	5	4	1	14
60+	0	1	3	1	1	6

Table 6: Cross-tabular table of question 2 and 14.

Age	Strongly Disagree	Disagree	Impartial	Agree	Strongly agree	Total

18-25	1	3	5	22	8	39
26-30	0	2	4	11	0	17
31-40	1	6	2	6	1	16
41-60	2	1	7	3	1	14
60+	0	3	2	1	0	6

Table 7: Cross-tabular table of question 2 and 15.

Age	Yes	No	Maybe	Total
18-25	34	0	5	39
26-30	15	1	1	17
31-40	13	1	2	16
41-60	10	1	3	14
60+	5	0	1	6

Table 8: Cross-tabular table of question 2 and 16.

Age	Yes	No	Maybe	Total
18-25	7	20	12	39
26-30	2	8	7	17
31-40	1	13	2	16
41-60	1	12	1	14
60+	1	4	1	6

Table 9: Cross-tabular table of question 2 and 18.

Age	Yes	No	Maybe	Total
18-25	29	0	10	39
26-30	13	2	2	17
31-40	10	1	5	16
41-60	12	0	2	14
60+	5	1	0	6

Table 10: Cross-tabular table of question 2 and 19.

Age	Yes	No	Total
18-25	31	8	39
26-30	13	4	17
31-40	8	8	16
41-60	8	6	14
60+	3	3	6

Table 11: Cross-tabular table of question 4 and 5.

Nationality	Yes	No	Maybe	Total
British	31	19	11	61
International	19	5	7	31

Table 12: Cross-tabular table of question 4 and 7.

Nationality	1	2	3	4	5	Total
British	5	4	16	27	9	61
International	1	4	7	11	8	31

Table 13: Cross-tabular table of question 4 and 9.

Nationality	Yes	No	Maybe	Total
British	29	18	14	61
International	15	9	7	31

Table 14: Cross-tabular table of question 4 and 10.

Nationality	Yes	No	Maybe	Total
British	20	37	4	61
International	12	10	9	31

Table 15: Cross-tabular table of question 4 and 11.

Nationality	Not at all	V.Casually	Casually	Intensively	V.Intensively	Total
British	6	13	19	14	9	61
International	1	4	11	10	5	31

Table 16: Cross-tabular table of question 4 and 14.

Nationality	S.Disagree	Disagree	Impartial	Agree	S.Agree	Total
British	3	15	13	26	4	61
International	1	0	7	17	6	31

Table 17: Cross-tabular table of question 4 and 15.

Nationality	Yes	No	Maybe	Total
British	50	3	8	61
International	27	0	4	31

Table 18: Cross-tabular table of question 4 and 16.

Nationality	Yes	No	Maybe	Total
British	9	44	8	61
International	3	13	15	31

Table 19: Cross-tabular table of question 4 and 18.

Nationality	Yes	No	Maybe	Total
British	48	2	11	61
International	21	2	8	31

Table 20: Cross-tabular table of question 11 and 5.

Intensively	Yes	No	Maybe	Total
Not at all	3	4	0	7
V.Casually	8	7	2	17
Casually	13	8	9	30
Intensively	13	5	6	24
V.Intensively	13	0	1	14

Table 21: Cross-tabular table of question 11 and 8.

Intensity	Formula 1.	Formula 1, Other Formula categories.	Formula 1, Any other motor racing series	Formula 1, Other formula categories, Any other motor racing series.	Non of the above.	Other Formula Categories, Any other motor racing series.	Any other motor racing series.	Total
Very intensively	0	3	0	11	0	0	0	14
Intensively	4	2	3	13	1	1	0	24
Casually	4	5	7	14	0	0	0	30
Very Casually	5	1	3	7	0	1	0	17
Not at all	2	0	2	2	0	0	1	7

Table 22: Cross-tabular table of question 11 and 9.

Intensively	Yes	No	Maybe	Total
Not at all	4	2	1	7
V.Casually	7	6	4	17
Casually	16	9	5	30
Intensively	11	8	5	24
V.Intensively	6	2	6	14

Table 23: Cross-tabular table of question 11 and 10.

Intensively	Yes	No	Maybe	Total
Not at all	2	5	0	7
V.Casually	6	10	1	17
Casually	9	14	7	30
Intensively	5	14	5	24
V.Intensively	10	4	0	14

Table 24: Cross-tabular table of question 11 and 14.

Intensively	S.Disagree	Disagree	Impartial	Agree	S.Agree	Total
Not at all	0	1	3	3	0	7
V.Casually	2	6	3	5	1	17
Casually	2	5	5	14	4	30
Intensively	0	2	7	12	3	24
V.Intensively	0	1	2	9	2	14

Table 25: Cross tabular table of question 11 and 15.

Intensively	Yes	No	Maybe	Total
Not at all	3	1	3	7
V.Casually	10	2	5	17
Casually	27	0	3	30
Intensively	23	0	1	24
V.Intensively	14	0	0	14

Table 26: Cross-tabular table of question 11 and 19.

Intensively	Yes	No	Maybe	Total
Not at all	1	6	0	7
V.Casually	2	14	1	17
Casually	2	21	7	30
Intensively	3	10	11	24
V.Intensively	4	6	4	14