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Research paper

Why so few EVs are in Kuwait and how to amend it

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Abstract

The automotive industry is at a crossroad. Electric Vehicles (EV) now pose an existential threat to the Internal Combustion Engine (ICE). In some Northern European nations over 50% of new cars sold are EVs, owing in large part to substantial financial incentives to buy and own an EV, such as tax discounts when purchasing an EV, fuel savings, and preferential use of transportation infrastructure. These countries have pledged to cease all imports of non-EVs by 2035. On the other end of the spectrum are Gulf Cooperation Council (GCC) countries, where EVs account for less than 1 percent of vehicles on the road, due in large part to financial and non-financial impediments to buying and owning an EV. In addition, the price per kilometer driven in the GCC is considerably lower with gasoline than with electricity, which contradicts the European experience where cost savings from electricity versus gasoline can be around 8 to 1. Furthermore, as there is an absence of purchase and ownership/utilization taxation of vehicles in the GCC, no tax discount can be levied, in contrast to the EV tax incentives common in Europe. This paper explores which qualities of driving and owning an EV in the GCC are necessary to persuade certain kinds of new automobile consumers to pay a higher purchasing price for owning an EV as opposed to an ICE, in spite of higher costs for electricity compared to gasoline per kilometer driven. This pilot study attempts to provide an insight to new car purchasing behavior among consumers in Kuwait via a qualitative innovative approach known as 'Q Methodology'. Interestingly, the factors that emerged from the research represent three subjective perspectives of new car purchase in Kuwait which were labeled as Factor 1, 'Value Seeker'; Factor 2, 'Safety Seeker'; and Factor 3, 'Performance Seeker'. The study concludes that given financial constraints, the 'Value Seeker' group is not likely to become an early adopter of EVs in the GCC region. Conversely, the 'Performance Seeker', which includes mainly younger men who are more likely to view the fast acceleration of EVs as a deciding factor, and the 'Safety Seekers', who are mainly younger women who would value the environmental aspects of EVs as well as the quiet driving experience and low maintenance requirements are determining factors for EV adoption in the GCC region in the future.

Keywords: *Decision-Making-Process; Q method; Consumer Behavior; Kuwait; Electric Vehicle*

1. Introduction

The world is seeing the fastest changing trends in purchasing behavior of new automobiles in decades which might be something that can only be described as 'paradigm-shifting'. Last year, an EV passenger car, a Tesla Model S P100D which sells for less than 100,000 USD, outpaced the 2-million-dollar supercar Bugatti Veyron 1001 horsepower, which was believed to be the fastest car in the world, in a quarter-mile race (Ilyukhin and Semenchenco, 2020). After several humiliating defeats of their own against Tesla, Porsche introduced their own EV version of the Porsche Taycan. In July 2020, Tesla became the most valuable automaker company topping Toyota (Cornel, 2021). EV technology has clearly come to stay and take over in specific fields and customer segments. It is worth noting that a study conducted in Iceland, an early adopter of EVs, indicated that single men prefer EVs because of their fast acceleration from the maximum torque allowed by the lack of a gearbox. Many owners compare the experience to owning their own performance car. Younger females, on the other hand, tend to prefer EVs because of their environmental friendliness and silent engine, and a driving experience some have likened to a flying carpet. Family drivers preferred the EVs because of fuel cost savings and low maintenance. All groups liked that there was no import tax on EVs or Plug-In Hybrids (PIH), which made their cost comparable or cheaper than equivalent ICE car. (Ottesen, A. and Banna, S., 2018). There is a need to understand emergent consumers' behaviors, perceptions, preferences, and tastes in view of EV's disruptive technology. It is also interesting to note that marketing is becoming more sensory-oriented and connects nodes of consumer senses in order to impact their perceptions, or as the proverb goes "Perception is the only Truth you need to know." The purpose of the current pilot study aims to explore consumer behavior in terms of perceptions when making new car purchasing decisions in the Kuwaiti market, whether prospective buyers are looking for a "flying carpet" or a "disguised supercar" as per the Icelandic study 2018.

Kuwait has a rich and relatively open economy with 6 percent of the world's oil reserves and the fourth largest sovereign fund in the world. It is a relatively densely populated, predominantly single metropolitan area where the bulk of the 4.3 million population lives. 31 percent of the population is gender-balanced Kuwaiti nationals, and the remaining 69 percent are guest-workers that are predominantly men aged from 30 to 60, mainly of Indian or Arab origin. Prior to Covid-19, petroleum accounted for over half of the country's GDP, 92 percent of export revenues and 90 percent of government income (Giris, M. and Ramadan, M. 2018). This great revenue stream has in the past paid

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for almost all public services allowing citizens as well as expats a tax-free living without income tax or value added taxes. As a result, Kuwait was recognized as one of the most lucrative markets for the largest automobiles in the Middle East and North Africa Region (MENA). Over the last 50 years, the demand, especially from Kuwaiti nationals, has been for large-sized vehicles with heavy-duty shock absorbers, transmissions, heavy engine cooling, and powerful and fast air-conditioning systems (Giris, M. and Ramadan, M. 2018). The Covid 19 pandemic might have changed all that. In 2020 the Kuwait government had a 10.8 billion KWD budget-deficit, the highest in the country's history. The 2021 year's budget deficit was approved at 12.1 billion KWD (Arab Times 2021). These deficits were mainly due to a fall in oil revenues to 8.8 billion in 2020, which was a 43 percent decrease from 2019. As a result, the credit agency Standard and Poor downgraded the State of Kuwait's credit rating from AA- to A+ with a negative outlook (Reuters, 2021). The IMF states that VAT taxation and the trimming of subsidies is inevitable in light of unfinanced governmental expenditures (Arab Times, 2021). Future price hikes due to the introduction of VAT taxation, the lowering of subsidies on gasoline, and freezing salaries in the public sector where 75% of Kuwaiti citizens work will undoubtedly change automobile buying behavior in the near future, maybe in favor of EVs. The introduction of a VAT levy on automobile sales will give the government an opportunity to offer tax exemptions on EVs, which might stimulate demand like it has in many European countries (Ottesen, A. and Banna, S., 2018).

GCC states are currently fringe players in the use of alternative non-carbon-based fuels for ground transportation, with EVs comprising less than 1% of all ground vehicles. However, there is a strong push to address this slow take-up of EVs, as demonstrated by the Kuwaiti government's Vision 2035 – a development vision that has been drawn up to guide Kuwait's "socio-economic transformation over the coming decades" (Olver - Ellis, S. 2019). The vision stresses the need for much less reliance on gasoline as a transportation fuel. Reflecting this vision, no less than 14 governmental agencies are presently involved in researching and promoting the transition from ICE vehicles to EVs in Kuwait (with a particular emphasis on the infrastructural and technical aspects of this transition).

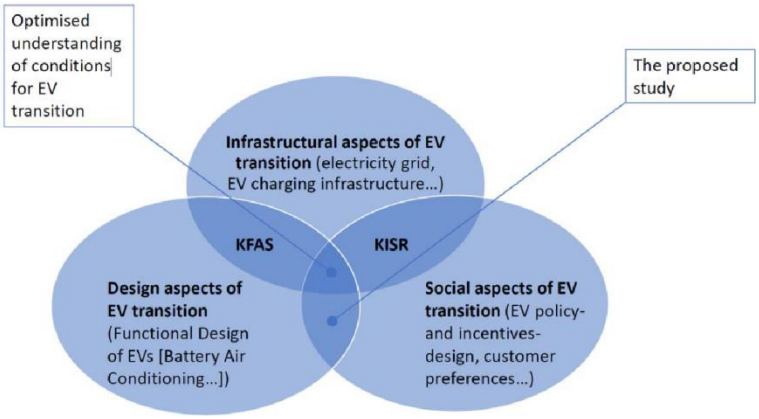


Fig. 1: Model of Framework of Proposal's Fit with Ongoing EV Transition Programs and Research Summarized in the Kuwait Vision 2035 (Kuwait Ministry of Foreign Affairs, 2021).

The Kuwait Foundation for Advancement of Science (KFAS) is already running a renewable energy program to evaluate the performance of EVs. An important aim of this program is to better understand technical requirements for the design of EVs so that they can be used in hot climatic conditions that require heavy use of air-conditioning, which is a factor strongly associated with EV battery depletion, and thus the range EVs can drive and therefore their appeal to consumers (Kim, S., Lee, J., and Lee, C. 2017). Other governmental and research bodies such as the Kuwait Institute for Scientific Research (KISR), along with the Ministry of Water and Electricity and the Ministry of Interior, are looking at the infrastructural needs (e.g. Charging point networks) for widespread EV-adoption in Kuwait (Sgouridis, S., Helmers, E., and Al Hadhrami, M. 2018). This pilot study and several others that will follow address a broad gap in EV research in settings like Kuwait, namely a lack of attitudinal and customer preference research into perceptions of EVs (Khandakar, A. et al. 2020). As summarized above, research into the technical and infrastructural dimensions of EV-adoption in GCC countries is well underway (Unger, B. 2020). Much less understood, however, is the third pillar of adoption (Figure 1) – namely social attitudes towards EVs and EV-use in Kuwait, and how best to market EVs there once those attitudes are better understood. In addition, our research fills two smaller gaps in the existing research into attitudes towards EV-adoption in the Middle East. First, existing studies (e.g., Bridi, R.M. et al. 2020; Khandaker, A. et al. 2020) rely on survey data (Kumar, R.R., and Alok, K. 2020: 2) but fail to explore the attitudes reported in surveys in more depth using qualitative data. Second, these same studies also concern prospective EV owners only, and fail to include the perspectives of early adopters.

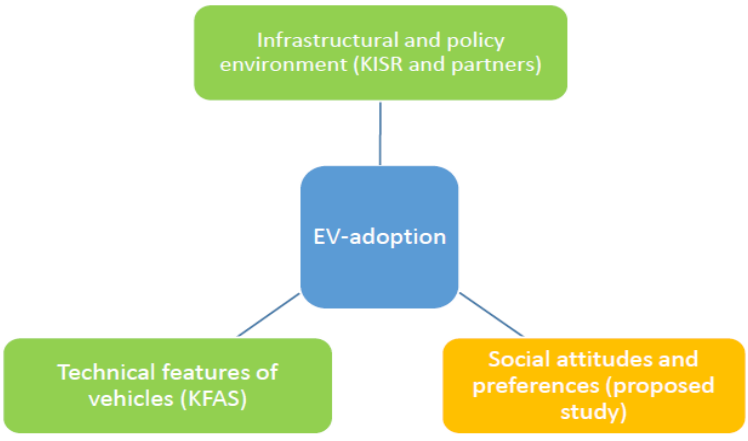


Fig. 2: Three Core Pillars of EV-Adoption (Adapted from Coffman, Bernstein and Wee, 2017).

There is a growing body of research on EV-adoption, mainly relating to settings in Northern Europe (Kumar, R.R., and Alok, K. 2020). While these capture important principles of EV-adoption and technology adoption more broadly, the applicability of the theories and derived models (e.g., Soltani-Sobh, A. et al. 2017; Haustein, S. and Jensen, A.F. 2018) to EV-adoption in Kuwait and the GCC is limited for various reasons. These include:

a) Kuwait has a very hot climate which has important implications for how vehicles are used, and for vehicle suitability, compared to countries in Northern Europe.
b) The minimalist tax system in Kuwait means that relative to countries in Northern Europe, very low taxes are levied on the purchase of gasoline for automobiles or on the use of road infrastructure.
c) Kuwaiti families tend to have drivers, which is important given car owner preferences may be distinct from car driver preferences – EV drivers and owners tend to be treated as analogous elsewhere.

The proposed research is a pilot study to discover the unknowns and to refine inputs for 3 much larger studies that will follow. All these studies are designed to address this research gap and explore why so few people living in Kuwait have opted to transition from ICE vehicles to EVs, and to use these findings to inform policy and marketing around EV transition and promotion in Kuwait. Using a mixed-methods design (integrating q-methodology, focus group discussions and semi-structured interviews), the study explores Kuwaitis' automobile preferences and attitudes towards, as well as experiences of, EVs. The study will also provide evidence for how the marketing of EVs, as well as their design, can be adapted to make EV-adoption more appealing to Kuwaitis. Likewise, it will consider how Kuwaiti policy and legal frameworks might be adapted to support transitioning to EVs. Furthermore, the studies will also consider the wider implications of our study for other GCC member states.

2. Literature review

Generally, most people at one stage of their lives are faced with a car purchasing decision, whether for a new car or a used one. Every individual is unique in their selection criteria, which makes it unpredictable for the automobile industry to understand customer perceptions. For a demographic category such as gender, for example, women in the US tend to prefer small cars and SUVs compared to men, who generally prefer sports and luxury cars. Also, extravagant colors were mostly preferred by men where women preferred discrete colors on a car (Ljung, S. 2017). The findings strengthen the theory that demographic factors might strongly influence the choice of car to be purchased by a consumer. When shopping for a car, several factors are considered, including comfort, safety, initial cost and cost of ownership. A strand of literature which emphasizes car purchasing decisions among Asian customers focuses on certain perceptions such as brand, interior, and exterior style/design features. A recent study found that since Asian consumers are more group/collective-oriented as compared to Western individualist culture, Asians tend to be much more affected by the perception and opinions of others than do their Western counterparts when purchasing a car (Nayeem, T. 2021). In addition to family/peer pressure, maintaining and demonstrating social status appeared to be a main factor for Asians when purchasing a new vehicle (Gautam, 2014) (Kumar, G.R. 2014). Moreover, brand image and brand loyalty, as well as interior and exterior style and design features are the most important factors for buyers in Asian markets. Brand-loyal consumers find that their new cars have accessible maintenance facilities as well as price discounts and service differentiations (Kumar, G.R. 2014). An earlier study conducted by Raghu (2013) found that there is an increased demand for brand-name cars due to an increase in disposable income. The study also suggested that car companies need to focus on marketing and brand cultivation in order to attract and retain buyers. Therefore, research tends to show the importance of the brand factor in the decision-making process when buying a new car (Dhanabalan, T. et al. 2018).

A similar strand of literature studying the Indian market has found that vehicle price and value was the most significant factor for prospective buyers whereas style and color of vehicle were the least important criteria. Similarly, Lee and Govindan (2014) indicate that car reliability, safety, and price significantly influence consumer buying behavior towards national/local cars in Malaysia. The finding suggests that car corporations need to focus on these three variables to increase their sales of new vehicles. Kassim et al. (2016) and Hung and Yazdanifard (2015) suggest that safety is considered to be one of the top three factors when purchasing a car among consumers in Malaysia. This information is essential for policy makers, manufacturers, and other stakeholders to assist in setting priorities regarding the promotion of car safety in the country. This is important to reduce road fatalities and prevent grievances and accidents.

Another area of research has centered on environmentally friendly cars. Exponential world population growth and rising incomes has led to a dramatic increase in the number of vehicles on the roads and thus more pollution. A solution to this problem has focused on the development of electric and hybrid vehicles with limited or zero gas emissions (Milev, G., Hastings, A., and Al-Habaibeh, A. 2019). Vilchez et al. (2019) surveyed car owners in several European countries - France, Germany, Italy, Poland, Spain, and the UK- to explore their opinion about electric cars. The study indicated that nearly 50 percent of the respondents did not prefer electric cars and the main reason was their higher upfront price. Fortunately, continued research is being done on lithium-ion batteries, which could finally make electric cars as cheap and convenient as gasoline fueled ones (Temple, J. 2021). Ottesen and Banna (2018) conducted a comprehensive survey that aimed to measure the market readiness for electric vehicles in Iceland as a predictive assessment for European and American markets that would be the most likely customer segment of electric vehicles for 2018. The study found that financial factors, battery-charging infrastructure, and battery-related concerns remain major obstacles to widespread market penetration of EVs in Iceland.

A review of the literature shows that most studies have focused on consumers in "industrialized" countries and have largely ignored emerging economies in Asian markets such as China, Malaysia, and India, which is our emphasis here. A study conducted in Algeria found that new car purchasing decisions are based on brand perceptions among consumers (Khalifa and Maliki, 2014). Although one study has explored the effect of culture and tradition on buying habits among Kuwaiti consumers (Bahhouth, V., Ziemnowicz C., and Zgheib, Y. 2012), our review of the literature did not come across any study that explored the phenomena of quality and service preferences in new car purchases in the Gulf states, particularly Kuwait. Therefore, the present study aims to fill this gap in the literature by using Kuwait as a case study and an exemplar of GCC countries and also by utilizing examples from developing countries in the Mena region.

3. Research design

The Q method was used as a quantitative method in addition to factor analysis. This method receives much attention in social research to study human subjectivity that represents behaviors, opinions, individuals' feelings, experiences, or preferences (Stephenson, W. 1953). Q methodology has been widely used since 1985 in psychology, communication, political science, health, environment, and other related fields. It aims to explore the possibilities of various perspectives and consensus within the group about specific topics under investigation rather than statistically measuring the sample or population. This study employed Q methodology as the main tool for data collection and

data analysis. What this method does is it clusters participants rather than variables, which is often seen in surveys and questionnaires. Q method, however, only utilizes a small number of participants to provide various viewpoints. For the application, this method requires a Q grid for ranking collected statements according to the participants' preferences. This method uses the collected Q grids for clustering and data analysis (factor analysis). The previous various studies utilized various software-based tools such as visual Q method (VQ Method), Q-Assessor, and Flash Q software for data collections and ranking the statements. In the second phase of a Q-study, participants are asked to sort the collection of statements, known as the Q-sample, in this case 30 items, based on their personal experiences. Unlike the concourse, the Q-sort is conducted on an individual basis. This Q-sort involved a group of relevant potential consumers of automobiles in Kuwait. A total of 50 participants (Q-sample) successfully sorted the 30 statements concerning what they would want in an automobile. The participants took an average of 1 hour to complete the study and emailed their responses back to the researchers. Under the instruction of the researchers, participants were asked to make an initial reading through the Q-sample to get the impression of the range of opinions and then roughly sort the cards of statements into three equal sets: those statements selected to be positive statements, neutral, and negative based on their individual perceptions. After ranking each set, they would start with the positive set at the +4 column on the Q sort scale and work down the ranking until the first categories have been placed on the data sheet (Q-grid) from the right. A completed Q-set is demonstrated. (Cottle, C. & McKeown, B,1980).

A similar process occurs for the remaining categories being placed in the -4, -3, and -2 category and the remaining filling in the middle columns of the inverted pyramid on the datasheet. (Stephenson, W., 1935) The consequence of the sorting process is a forced decision-making process, where the participants must decide amongst the statements and produce a result that reflects their decisions) (Brown, S. R., 1993).

4. Findings and discussions

4.1. Demographic profile (Q-sample)

The proportion of the respondents between males and females was slightly higher for females (60% female vs 40% male) (see table 1). The respondents were between 20 and 36 years old, where 80% had prior car buying experience. In terms of household income, the majority had an income of less than 500 KWD/month. The Q-sample (participants) are Kuwaiti nationals who are working towards their college degrees.

Table 1: Q-Sample Demographic Profile

	N (%)
Gender	
Male	20(40)
Female	30 (60)
Age Group	
20 to 27 years old	45 (90)
28 to35 years old	5 (10)
	N (%)
Monthly Income	
Below 500 KWD	28(55)
500KD to 999 KWD	15(30)
1000KD to 1499 KWD	7 (15)
Car Buying Experience	
Yes	40 (80)
No	10 (20)

When asked what makes new-car-consumers act 40 percent of the respondents answered 'lifestyle and habits' as the main driving force., as reflected in Figure 3. The second important factor is 'having a good disposable income proportion'. This is a strong indication of the growth in per capita income and consequently the growth of the Kuwaiti automobile industry. The remaining four choices, namely 'road safety', 'family size is growing', and 'family needs and necessity', were the least important motivating factors, as demonstrated in Figure 4.

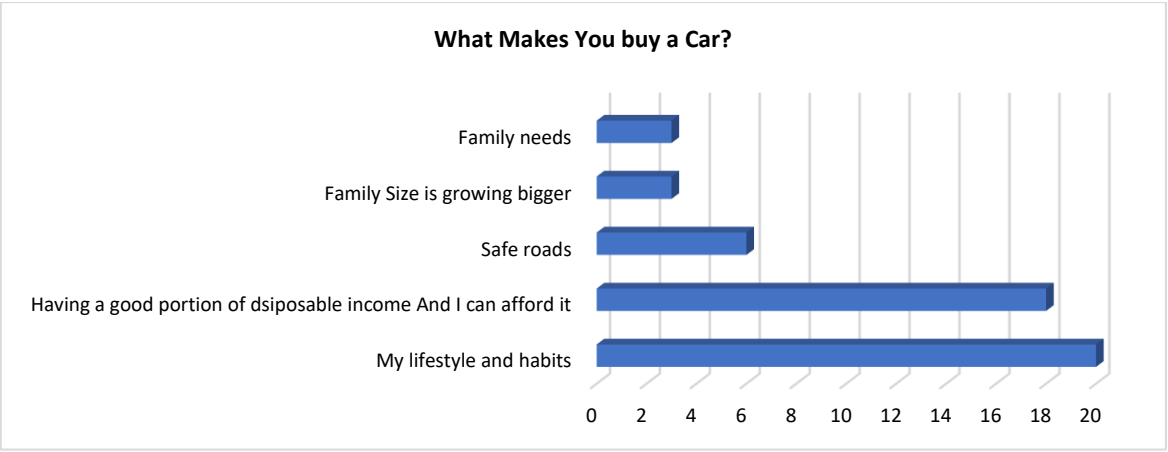


Fig. 3: Decision Making Factors and the Drivers Behind Car Buying Decisions.

Table 2: Roles in Car Buying Decision

	What is your role in car purchasing?
Initial choices of brands & model	16
Test driving the new car	12
Dealer visiting	12
Decision of budget	8
I am a user	2
Grand Total	50

When asked which information sources are used to inform a new car purchase, 52 percent of the respondents indicated online sources such as websites and social media platforms such as Instagram and Twitter. This was followed by an equal proportion (18 percent) of respondents who identified 'friends and significant others' and 'car shows' as their primary sources of influence when buying a car. Only about 12 percent of the respondents rely on dealerships, as shown in Figure 5.

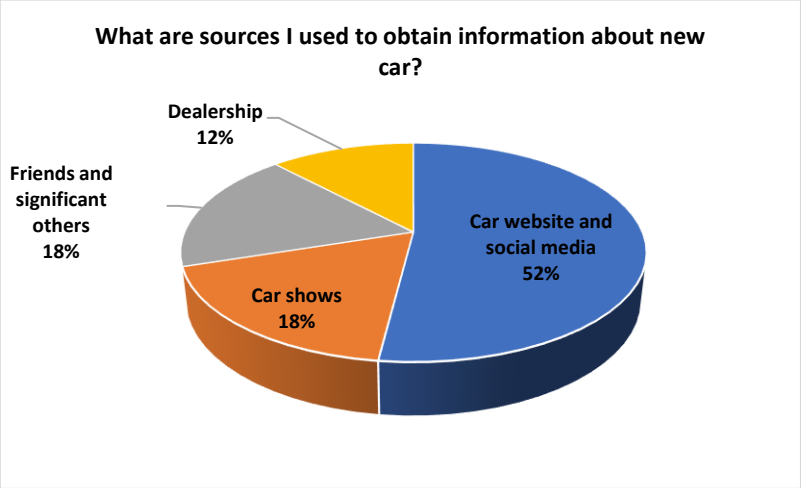


Fig. 5: The Information Sources for Car Buying.

5. Discussion

In this study, a three-factor solution was selected for the interpretation of the data as it has a high number of sorts, a low level of confounded sorts and insignificant sorts. The 3 Factors are described below.

1) Factor 1-Value Seeker

Factor 1 consists of 16 (40%) participants. Table 3 contains the extreme statements from Factor 1, 14 statements with which these participants strongly agreed. The Z-scores are used as the criterion of selecting these statements. In this factor, there are 10 males and 6 females aged 20-27 years old. This factor sees the statements concerned about brand equity, brand loyalty and brand associations as indicated in statements nos. 27, 28, 29, 23, 21, and 6. The high z-value score explained the perception that participants have in this group in selecting a brand they recognize, compared to unfamiliar brands as indicated in statement no. 27. Therefore, this factor is labelled as 'Value Seeker'. This factor recognizes the benefits of being loyal consumers at a young age, as it provides them with after-sales benefits such as warranties, maintenance and repair facilities, and credit and financial facilities as reflected by statements nos. 19, 17, 18, 25, and 26. This explained that the perceived reliability and perceived quality of a brand have a direct impact on consumer purchasing decisions (Armstrong and Kotler, 2003). The Value Seeker buyers are always searching for commitment to the brand that they are familiar with because this signifies their personality as demonstrated in statement nos. 23 and 27. As indicated in statement no. 23, brands have their own personality, the brand personality, which can be viewed as a set of demographic characteristics such as gender, age, and socioeconomic class as well as classical human personality associated with a given brand. Thus, both are distinctly enduring.

The findings confirm with previous studies such as Aaker (1991) and Tlili (2010) that the Value Seeker group prefers friendly sales personnel and road testing before making a new car purchasing decision, as indicated in statement nos. 20 and 2. The Value Seeker group initiates the purchasing process as shown in statement no. 30. This finding confirms with a previous study conducted by Bahhouth, Ziemnowicz, Zgheib (2012) which showed that families in Kuwait are still influenced by traditional and patriarchal mores where men take a dominant role in car purchasing decisions. Therefore, it is vital for marketers to understand what drives this group to favor one brand over another. The more marketers understand consumer behavior, the better they can tailor to their shopping experience.

Table 3: Factor 1- Value Seeker-Strongly Agree Statements

No.	Statements	Z-Score
27	I prefer to buy new car that has a familiar brand name	2.23
19	I prefer buying a new car that has more than three years warranty in the engine and body parts.	1.95
28	I am a loyal customer when it comes to buying a new car	1.77
29	I would rebuy the same brand-new car that I am used to it before	1.68
17	Once the new car is broken and needs repair, the parts should be affordable and available inside Kuwait	1.58
18	I like to buy a new car because I care about after-sale service offered from the dealership	1.33
23	I prefer to buy a new car that is big as extension of my personality	1.21
20	I prefer to buy a new car from friendly and respectful salespersons.	1.13
21	I prefer to buy a new car where low interest financial service facility is available and accessible	1.11
6	I always buy a new brand car that I am passionate about and connected to its brand.	1.05
25	It is important for me that the loan covers 100 percent with no down payment when buying a new car	1.01
26	It is important for me that I can pay off the loan in 6-10 years when I buy a new car	0.989

2	I like to road-test it first before buying a new car	0.856
30	I usually initiate the new car buying decision in my family	0.742

2) Factor 2- Safety Seeker

Factor 2 consists of 12 (30%) participants. Table 4 contains the extreme statements from Factor 2, i.e., the seven statements with which these participants strongly agreed. The Z-scores are used as the criterion of selecting these statements. In this factor, there are 2 males and 10 females aged 20-27 years old.

These participants indicated safety measures to be one of the most important considerations in buying a new car, including anti-lock brakes, air bags, and favorable crash test scores, as shown in statement nos. 7, 8, 5, and 9. Therefore, this factor is labelled as 'Safety Seeker'. Consumers who seek safety features and measures search for car ratings before purchasing a new automobile. This is a strong indication that Kuwait has infrastructure issues due to bad road conditions during severe rains in the winter season and high rates of accidents. Consequently, there is increasing demand for safety-related innovations and features such as air bags, emergency assistance, anti-lock brakes and automatic crash notification (Hafzi, M. et al. 2014). The increasing demand for road safety has pressured car manufacturers to increase safety standards to reduce crash fatalities and reach out for their target consumers. This factor demands dealerships to provide long-term warranties on new cars and provide after-sales services as indicated in statement nos. 18 and 19. In addition, the automobile industry should offer maintenance and repair facilities and make spare parts more affordable and available to consumers in Kuwait (statement no. 17). The findings reveal that it is essential for government authorities to pave the way for better road infrastructure and improve the safety situation in the country.

Table 4: Factor 2- Safety Seeker-Strongly Agree Statements

No.	Statement	Z-Score
7	When I buy a new car, it is important for me that it has safety features, i.e., anti-lock brakes (ABS)	1.56
8	When I buy a new car, it is important for me that there are many air bags for added safety	1.44
17	Once the new car is broken and needs repair, the parts should be affordable and available inside Kuwait	1.06
18	I like to buy a new car because I care about after-sale service offered from the dealership	0.98
19	I prefer buying a new car that has more than three years warranty in the engine and body parts.	0.87
5	I prefer the new car to drive smoothly with soft suspensions and shock absorptions	0.62
9	When I buy a new car, it is important for me that the car scores favorably in crash tests for safe purposes	0.59

3) Factor 3- Performance Seeker

Factor 3 consists of 8 (20%) participants. Table 5 contains the extreme statements from Factor 3, namely the four statements with which these participants most strongly agreed. The Z-scores are used as the criterion for selecting these statements. In this factor, there are 4 males aged 28-35 years old and 4 females aged 20-27 years old. The participants consider high performance measures to be one of the most important considerations in buying a new car, including acceleration (0-100km/h), large-sized engines and smooth driving, as revealed in statement nos. 1, 3, and 5. The consumers in this factor prefer to do a road test first before making the purchase, as reflected in statement 2. Therefore, this factor is labelled as 'Performance Seeker'. The present study predicts that this group might significantly favor Electric Cars (EV) and recommends further studies on the matter.

Table 5: Factor 3- Performance Seeker-Strongly Agree Statements

No.	Statement	Z-value
1	When I buy a new car, it is important that it is fast acceleration (0-100km).	0.898
3	I prefer a new car with large engine i.e., 6 cylinders or more	0.776
5	I prefer the new car to drive smoothly with soft suspensions and shock absorptions	0.59
2	I like to road-test it first before buying a new car	0.542

6. Limitations and future studies

Although the current pilot research consists of interesting findings, certain limitations do exist. Firstly, the participants predominantly were college students in Kuwait and the oldest participant was 35 years old, which hardly represents the whole population of car owners in Kuwait. This will be addressed in our next study which will survey 500 participants in Kuwaiti malls in the fall of 2021. The purpose of this particular study was to provide input for the larger one and to discover unknowns and confirm hypotheses, such as: certain young men value fast acceleration over other aspects; young women tend to value environmental friendliness; and families are more concerned about the overall cost of ownership over a longer period of time. One discovery made during this study was how ground clearance plays an important role in buying decisions in Kuwait. Extremely high temperatures in Kuwait leave the road vulnerable to heavy rain damage, resulting in potholes on smaller, less maintained roads. That, along with high speed bumps in residential areas, has made high car ground clearance a perceived practical necessity. This is particularly important for EV owners, as the most expensive part of the car - the battery - is placed under the car and might get damaged if the car is too close to the ground.

Other valuable input from this study is the environmental aspect of driving EVs in Kuwait, since 99 percent of the country's electricity is produced using carbon-based resources (oil and gas) as opposed to renewable sources such as solar, wind or hydropower (International Renewable Energy Agency 2020). The question remains that if EVs are driven by electricity derived from non-renewable sources are they in fact environmentally friendly? The answer to that question is YES, even though the production of EVs is 30 percent more power-intensive than their ICE counterparts, which is mainly due to the high energy demands of battery manufacture. A recent report in the journal Nature Sustainability which measured net emission reduction in 59 regions over time showed that unless the electricity comes from burning dirty coal (in 2015 Poland, Cheque Republic Bulgaria, Estonia, India and Nepal), EVs fueled by electricity from nonrenewable sources such as oil and gas are more climate-friendly than driving using liquid gasoline (Knobloch, F. 2020). The reason for this is that EV motors convert over 85 percent of electrical energy into mechanical energy (power to the wheels), or motion, compared to less than 40 percent for an Internal Combustion engine (Boloor, M. 2019). Furthermore, according to the 2035 Sustainable Vision of Kuwait, Kuwait aims to have 15 percent of its energy needs supplied by solar power, up from 0.7 percent today. The Renewable Energy Agency affirms that Kuwait is especially suitable for this transition because of the high number of hours of sunshine (RENA, 2020). It is thus plausible that in the near future EVs in Kuwait could run on renewable energy.

The third concern here is the real impact of mass transition of ICE over to EVs. Currently only 12 percent of CO2 emission comes from ground transport, as depicted in Figure 6. This number though has to be compared to the total greenhouse emission per capita in comparison to other nations.

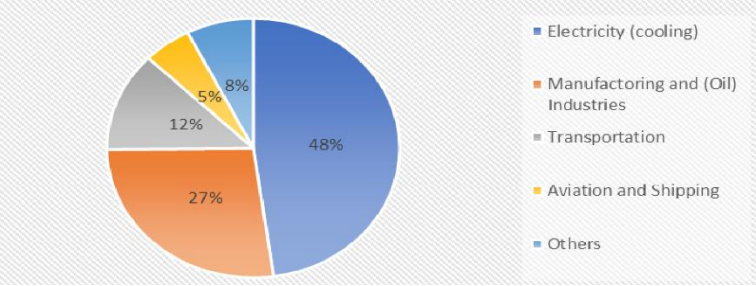


Figure 6: CO2 Emission Sources in Kuwait, Source: Climate Watch 2019

GCC	Metric Ton	Europe	Metric Ton
Qatar	38.8	Germany	8.5
UAE	22.9	Poland	8.4
Kuwait	22.6	Italy	5.6
Bahrain	21.6	Spain	5.6
Oman	18.6	UK	5.5
Saudi Arabia	18.0	France	4.8
Average	23.8	Average	6.4

Table 6: CO2 per capita emissions in metric tons in 2018 (adapted European Commission Joint Research Center (2021)

The oil producing GCC countries emit 3-4 times more greenhouse gases per capita in comparison to the biggest European countries (see Table 6). To put this into a European perspective, to have one person transition their ICE vehicle to an EV in the GCC would be roughly equivalent to 3-4 people in Europe doing the same. This is mainly due to the size of car engines in the GCC, as the Toyota Prado and Toyota Land Cruiser remain for the 8th consecutive year the most popular models in Kuwait (Best Selling Car blog 2020), as opposed to Europe's most popular car, the Volkswagen Golf, which has an engine one-quarter the size of the large SUVs (Autocar 2021). Furthermore, even though greenhouse gas emissions from ground transportation is only 12 percent, this is still quite high, and lowering it would make a significant contribution to air quality in Kuwait. Even though EVs in Kuwait are powered by electricity generated by fossil fuels, they would still generate a considerable reduction in emissions compared to ICE vehicles, since EV motors are much more efficient than traditional engines in generating power to the wheels. Questions and issues like these will be addressed in further studies, which will also capture the stories of current EV owners, their preferences, disappointments, and recommendations to the EV community. We will study in focus groups how to conceptually build EVs momentum for the Kuwait environment and which support will be needed from the government in terms of incentives, which have been successfully implemented in other countries.

7. Managerial implications and conclusion

The factor analysis demonstrates that there are three groups reflecting three consumer segments that have been extracted from the present study:

a) The Value Seeker consists of conservative, family-oriented value seekers that are quite concerned about the overall cost of car ownership, namely the initial cost (CAPEX) plus the operational cost (OPEX). This group prefers to buy the car from a well-established dealer with a great service record. Consumers in this group are extremely brand-loyal and are not likely to change their favorite brand. They are also affected by peer pressure and significant others and purchase the brand that close family or friends have purchased first. This group is clearly not an early adopter, and unless incentives are in favor of EVs, EV companies are advised not to put a lot of advertising dollars pursuing this group at the moment.

b) The Safety Seeker category is predominantly young single females who look for safety features as their top preferences, which include environmental safety and operational safety. Impact on the environment will appeal to this group, as will the low maintenance requirements of EV systems and the quiet driving experience. We recommend a viral online campaign to attract these potential early adopters, stressing the aforementioned values to appeal to targeted niche markets, such as young environmentally conscious women.

c) For the Performance Seeker, mainly young single men, winning is everything. That has to be reflected in online ad campaigns and how they can have their EV defeat supercars and high-performance vehicles like Porsches and Dodge Chargers in a drag race or quarter mile. Competitions on the Kuwait racing track would be perfect for this sort of campaign.

This pilot study provides evidence that consumers have diverse needs and wants along with various perceptions. Thus, we warns against 'one size fits all' approaches. Such an approach will lead to a huge waste of marketing dollars, especially given the fact that EVs are still more expensive to produce due to the cost of making the battery on top of the other production costs. Generous tax-incentives and financial incentive programs Europe and America even the playing field for EVs, however no such program exists as of today in Kuwait. Thus, only niche markets will be open to EVs as for early adopters. However, due to extreme heat conditions, EVs in GCC countries will have to be retrofitted accordingly with larger-capacity batteries. One can expect that the per electricity charge KM range will be at least 40% less than compared to given factory range (usually reference to 20C atmospheric temperature without heavy wind conditions). Moreover, Kuwaiti and other GCC residents are also used to fast-working and powerful ACs; slow or weak ACs would likely create a bad image and reputation which an incoming brand cannot afford. Nevertheless, this study concludes that there is potential for EVs in the GCC. If and when Kuwait will starts levying 15% Value Added Tax (as currently done in the Kingdom of Saudi Arabia) and the government will give tax exception to EV sales it is likely that the Value Seekers will start to show interest in EV purchases. The Value Seekers will also be enticed to purchase EVs if Kuwait will start giving infrastructural priorities to EV drivers with fast lanes on freeways and designated parking, and free charging stations, incentives many European countries have already implemented to increase EVs sales and usage.

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