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An Examination of Consumers' Opinions toward Adopting Electric Vehicles in the United Arab Emirates: On the Effects of Functional and Symbolic Values

Robert M. Bridi *, Marwa Ben Jabra and Naeema Al Hosani

Geography and Urban Sustainability Department, United Arab Emirates University, Al Ain P.O. Box 15551, United Arab Emirates
* Correspondence: rmbridi@uaeu.ac.ae

Abstract: The aim of this study was to examine consumers' opinions toward adopting electric vehicles (EVs) for light-duty transport in the United Arab Emirates (UAE) from the functional value (i.e., the utility or benefit attained by consumers from the functions or tangible features associated with EVs) and symbolic value (i.e., the social meaning that consumers associate with EVs) perspectives. The primary research question was as follows: To what extent do functional and symbolic values affect consumers' opinions toward adopting EVs in the UAE? The objectives were to determine if relationships exist between gender, age, and residency and the functional and symbolic values of consumers' opinions toward adopting EVs. A survey of 5459 people was conducted in 14 cities across the seven emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah, and Umm Al Quwain) to test the relationship. The results revealed that females, respondents aged 20–29, and residents living in Abu Dhabi City found more appealing functional and symbolic values regarding EVs.

Keywords: electric vehicles (EVs); functional values; symbolic values; opinions; adoption; United Arab Emirates (UAE)

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1. Introduction

According to the Global Energy Review 2021 [1], carbon dioxide (CO_2) emissions around the world nearly returned to their 2018–2019 peak of 5% in 2021. This is in part due to a rise in demand for oil, gas, and coal following the dips owing to the COVID-19 pandemic. The transport sector accounts for 37% of CO_2 emissions. This fell by 10% in 2020 due to lockdown imperatives around the world; however, demand in 2021 continued to rise unabated as passenger and cargo transport increased [2]. Given that transport demand is increasing, there is a global imperative toward decreasing CO_2 emissions by adopting noncarbon solutions [3].

The use of electric energy has been proposed as an alternative for gasoline-based light-duty road transport (cars, sport utility vehicles (SUVs), and small trucks). Electric vehicle (EV) technology, for example, has been improving, and EV cost has been decreasing; however, their market share remains low. In order to reduce CO_2 emissions from light-duty transport, the number of EVs on the road would have to increase to one billion by 2050 [4].

Most of the light-duty transport in the United Arab Emirates (UAE) uses gasoline engines. Furthermore, the UAE's urban design favors automobiles and a culture that promotes luxury cars and SUVs. Approximately 22% of CO_2 emissions in the UAE come from transport, which is increasing due to expected economic and population growth. For example, in Abu Dhabi, the number of vehicles is expected to increase from approximately 600,000 in 2010 to between 1.5 and two million in 2030. This translates to an increase in vehicle ownership from 264 vehicles/1000 people in 2010 to 642 vehicles/1000 people in 2030 [5].

The aim of the study is to examine consumers' opinions in the UAE toward adopting EVs for light-duty transport from the functional value (i.e., the utility or benefit attained by consumers from the functions or tangible features associated with EVs) and symbolic value (i.e., the social meaning that consumers associate with EVs) perspectives. The primary research question was as follows: To what extent do functional and symbolic values affect consumers' opinions toward adopting EVs in the UAE? The objectives were to determine if relationships exist between gender, age, and residency and the functional and symbolic values of consumers' opinions toward adopting EVs.

2. Literature Review

Many studies have examined factors related to purchasing behavior. Some authors examined the experiential aspects of consumption including "hedonic consumption [such] as those facets of consumer behavior that relate to the multisensory, fantasy, and emotive aspects of product usage experience" [6] (p. 92). Such studies point to the importance of subjective experience as it is associated with certain products and services. Organizations are increasingly seeking a competitive edge amidst growing competition and consumer demand. This has caused greater focus on the implementation of strategies aimed at delivering superior consumer value [7].

Consumer value refers to a consumer's strong relative preference for certain subjectively evaluated product or service attributes. Products and services must have intangible or subjective value that give consumers some benefits for which they are willing to pay a premium price. Furthermore, firms increasingly view consumers as informed seekers searching the best value for their money [8]. Consumers are no longer satisfied with going into a store, getting some information about a product or service, and making a purchase; rather, they are increasingly searching for the best value. The values that influence consumers' behavior are imbedded in decision-making processes about one product versus another [9]. Understanding consumer decision-making processes is essential for effective marketing strategies. Graf and Maas claimed that the "value concept is one of marketing theory's basic elements. Identifying and creating customer value ... is regarded as an essential prerequisite for future company success" [10] (p. 1). In other words, the success of a firm is increasingly linked to the value that potential consumers perceive about its products or services.

Some authors claimed that consumers' perceptions of value are tied to the utility of a product or service [11,12]. Utility is derived from the concept of usefulness. A product or service produces utility to the extent that it satisfies a consumer's want or need. Frenzen and Davis stated that the utilitarian attributes of a product or service has an impact on purchasing behavior [13]. Some consumers make purchasing decisions on the basis of utilitarian values. This is important because it directly influences the demand and, therefore price, of that product or service. Other authors examined the hedonic and utilitarian dimensions of consumer attitudes [14–17]. These studies connected purchasing behavior to consumer gratification based on sensory and utility attributes—the way a product or service makes you feel and the use which you gain when purchasing a product or service. Understanding the attitudinal dimensions of consumer behavior provides firms with effective methods to solving marketing challenges.

Chan, Gould, and Pascual proposed broadening the perspective of value "beyond the worth of nature itself (intrinsic values) and what nature does for us (instrumental values) to include preferences, principles, and virtues about human–nature relationships (relational values)" [18] (p. A1). Relational values allow for the integration of insights from the social sciences with concrete applications. For example, environmentally friendly purchase decisions may be associated with relational values such as environmental ethics, ecosystem services valuation, and environmental psychology [19]. Mahendar's study identified economic value, functional value, and service as having an impact on purchase intentions of solar energy systems [20]. In a study about luxury brands, Ostovan and Nasr employed three luxury value dimensions: experiential, symbolic, and functional [21]. The

authors found that consumers' luxury purchase intentions include hedonism, escapism, conspicuousness, quality, and usability. Examining multidimensional conceptualizations of consumer values provides insights regarding consumers' intentions about purchasing specific products and services.

Researchers have employed multidimensional perspectives of value to understand consumers' opinions toward adopting EVs in India [22], Korea [23], China [24], and Indonesia [25], among other countries in the world [26]; however, fewer studies have focused on the UAE. Furthermore, EVs not only provide basic transportation, but are also part of a broader solution for addressing the increase in CO_2 emissions. An investigation of the effects of relevant values on consumers' opinions toward adopting EVs is valid for predicting the purchase of "environmentally friendly" light-duty road transport [27,28]. Functional and symbolic values are factors that have an effect on whether or not consumers adopt EVs [29]. Accordingly, this analysis examines consumers' opinions in the UAE toward adopting EVs from the functional and symbolic values perspectives.

3. Hypothesis

Functional value refers to the utility or benefit attained by consumers from the functions or tangible features associated with EVs [30]. Functional value may be viewed as private and societal [31]. Functional private value refers to the benefits an EV brings to the individual. This includes performance benefits such as reliability, comfort, operability, driving range, and charging time [32]. In addition, there are monetary benefits such as government subsidy incentives, tax exemptions, and lower operating cost [33]. Lastly, there are convenience benefits such as ease of use, availability of charging stations, dealer incentives, and designated parking [34]. Functional societal value refers to the benefits that EVs bring to society. This includes reducing CO_2 emissions which contribute to global warming and smog, reducing air pollution which contributes to adverse health outcomes, reducing the reliance on petroleum, and preserving the environment [35].

Symbolic value refers to the social meaning that consumers associate with EVs [36]. Symbolic value may be viewed as private and societal [37]. Symbolic private value refers to the meaning that EVs bring to the individual. This includes self-expression, self-identity, self-concept, social image, personality, and identifying with a particular group or social class [38–40]. Symbolic societal value refers to the meaning EVs brings to society. This includes inspiring other consumers to adopt EVs [41], influencing automakers to manufacture EVs [42], challenging governments to devise regulations that support the adoption of EVs [43], and developing effective strategies to transition from fossil fuels [44].

On the basis of this formulation, the proposed research hypotheses are as follows:

FP: Functional private value positively affects consumers' opinions toward adopting EVs;
FS: Functional societal value positively affects consumers' opinions toward adopting EVs;
SP: Symbolic private value positively affects consumers' opinions toward adopting EVs;
SS: Symbolic societal value positively affects consumers' opinions toward adopting EVs.

The authors contend that consumers' opinions about EVs are based on functional private (e.g., performance, monetary, and convenience) and symbolic (e.g., reducing CO_2 emissions, reducing air pollution, reducing the reliance on petroleum, and preserving the environment) values. In this sense, functional private and societal values positively affect consumers' opinions toward adopting EVs. In addition, the authors contend that consumers' opinions about EVs are based on symbolic private (the meaning that EVs bring to the individual) and societal (the meaning EVs brings to society) values. In this sense, symbolic private and societal values positively affect consumers' opinions toward adopting EVs.

4. Materials and Methods

An online questionnaire survey was designed to test the hypotheses. Research assistants (RAs) were employed from the United Arab Emirates University to conduct the survey (14 senior undergraduate students in total, including a lead RA). They were pro-

vided with iPads that enabled them to access the online survey. The RAs worked in teams of two to conduct the survey in person using the iPads. They conducted the survey in malls and/or plazas between February and August 2019 to collect data from a sample population in the largest cities across the seven emirates: Dubai (population 1,137,347), Abu Dhabi (603,492), Sharjah (population 543,733), Al Ain (population 408,733), Ajman (population 226,172), Ras Al Khaimah (population 115,949), Fujairah (population 62,415), Umm al Quwain (population 44,411), Khawr Fakkan (population 33,575), Dibba (population 30,000), Al-Hisn (population 26,395), Adh Dhayd (population 24,716), Ar Ruways (population 16,000), and Muzayri (population 10,000). The largest cities were chosen because they are the best representation of the population in the UAE, with 87% of the population living in cities within the seven emirates [45].

The study used a nonprobability convenience sampling method. It was chosen for three reasons. First, it allowed the RAs access to a diverse group of respondents; second, it is useful for collecting data from potential users of EVs to understand specific issues or opinions; third, it is a simple method of collecting data where quotas are met quickly. The use of convenience sampling, however, has been criticized due to the inability to generalize research findings, the relevance of bias, and high sampling error. In order to reduce bias, multiple samples were collected to produce reliable results. In total, 5459 people were surveyed. Considering that multiple samples were used to obtain the data, the chi-square test and the *t*-test were applied to test the differences between these samples. The results revealed no significant differences. Detailed demographic group characteristics are shown in Table 1.

Table 1. Respondents' demographic group characteristics (N = 5459).

Demographic Group		Percentage (%)
Gender	Male	50.9
	Female	46.5
	Prefer not to say	2.6
Age	19 years and below	28.5
	20–29 years	41.1
	30–39 years	14.5
	40–49 years	9.7
	50–59 years	5.3
	60 years and above	1
Emirate	Abu Dhabi	46.1
	Dubai	19.9
	Ras al-Khaimah	4.2
	Umm al-Quwain	1.3
	Sharjah	14.6
	Fujairah	4.5
	Ajman	9.6
Income	Below AED 5000	52.5
	AED 5001–AED 10,000	16.2
	AED 10,001–AED 20,000	12.4
	AED 20,001–AED 30,000	9.3
	AED 30,001–AED 40,000	3.3
	AED 40,001–AED 50,000	1.5
	Above AED 50,000	3.6
Education	Elementary	3.2
	High school	37.3
	College diploma	8.7
	Undergraduate (e.g., BA)	41.9
	Masters	5.6
	PhD	2.6

The study comprised four perceived values to explore consumers' opinions toward EVs. The opinions referred to either accepting or not accepting EVs when choosing to

purchase a vehicle. The opinions were measured using four items. The items asked the respondents if they were interested in EVs and to evaluate EVs. To determine if respondents were interested in EVs, two five-point scales were used (1 = strongly disagree and 5 = strongly agree) and (1 = very unimportant and 5 = very important). To determine how respondents evaluated EVs, one five-point scale was used (1 = very unappealing and 5 = very appealing). In total, 17 items were employed to measure four value dimensions using a five-point scale. All the constructs are shown in Table 2.

Table 2. Constructs and measurement items.

Constructs	Items	Coding
Functional private	Have you had any experience driving an electric vehicle?	FP1
	Save money on petroleum	FP2
	Save money on car maintenance	FP3
	Initial cost of purchase	FP4
	Long charging time	FP5
	Inconvenient charging options	FP6
	Short driving range	FP7
	Lack of trust in new technology	FP8
Functional societal	Reduce air pollution	FS1
	Reduce global warming	FS2
	Reduce the use of petroleum	FS3
Symbolic private	Owning an electric vehicle is an important aspect of my self-identity	SP1
	Owning an electric vehicle conveys a high social status	SP2
	Owning an electric vehicle conveys a concern for the environment	SP3
Symbolic societal	Owning an electric vehicle inspires other consumers to do the same	SS1
	Owning an electric vehicle sends a message to governments and oil companies about consumer concern for the environment	SS2
	The importance of someone else's opinion regarding your choice of an electric vehicle	SS3

5. Results

Since the measurements of the items were calculated using the same statistical technique, there might be common method bias (CMB) that threatens their validity [46]. CMB happens because the instrument causes differences in the responses of the respondents. Consequently, the biased instrument contaminates the results. The single-factor test by Harman is useful to determine if CBM occurs. Single-factor variance must be lower than 50% for the CMB not to affect the data [47]. Confirmatory factor analysis (CFA) calculates if the variables are representative of the items. CFA is useful for accepting or rejecting the measurement model.

To assess the model fit, the chi-square to degrees of freedom ratio (χ^2/df), Tucker–Lewis Index (TLI), comparative fit index (CFI), and root-mean-square error of approximation (RMSEA) were used [48]. A chi-square of greater than or equal to 0.05 is required for a suitable model fit. A TLI from 0 to 1 shows reliability, with a higher value showing more reliability. A CFI from 0 to 1 shows fit, with a higher value showing greater fit. An RMSEA of 0.01 shows excellent fit, of 0.05 shows good fit, and of 0.08 or higher shows mediocre fit [49].

R-squared (R^2) calculates the amount of variance in the dependent variable explained by the independent variable or variables collectively in a regression model. This is calculated using percentages from 0% to 100%, where a low percentage, such as 0%, does not explain any variance, and a high percentage, such as 100%, explains all the variance. Cronbach's alpha is a calculation of how related to each other items are within a group. It is useful for determining internal consistency. Composite reliability also calculates internal consistency [50]. Composite reliability is equal to the true score variance relative to the scale score variance [51]. An acceptable composite reliability threshold is equal to or greater than 0.60; however, it is acceptable for a construct with five to eight items to have a 0.80 threshold. According to Yang, "factor loadings are part of the outcome from factor

analysis, which serves as a data reduction method designed to explain the correlations between observed variables using a smaller number of factors" [52]. Factor loadings use a scale from 0 to 1 to determine the strength of the relationship between the measures of the constructs. The average variance extracted (AVE) is the variance that a construct captures relative to variance from a measurement error. An acceptable AVE should be at least 0.5.

5.1. Measurement Model Testing

The analysis was conducted using SPSS 26 and Amos 26. CMB did not affect our data since the total variance extracted by one factor was 29.131%, which is less than the recommended threshold of 50%. The CFA model used was acceptable. The $\chi^2/df = 19{,}319.190/191 = 267.12$. TLI indicated good reliability with a 0.691 value. CFI indicated good fit with a 0.745 value. RMSEA indicated mediocre fit with a 0.135 value.

Table 3 shows that each measurement item related to its parallel latent construct and each coefficient was larger than the standard error, thus attaining unidimensionality and convergence. Most of the R^2 values were reliable since they were higher than 0.30. Cronbach's alpha values were higher than 0.661 reaching nearly 0.70, which is the recommended threshold for internal consistency. Three out of four values of composite reliability were greater than 0.853, which represents good reliability. The factor loadings were greater than 0.05, which is acceptable. One AVE value was nearly 0.5 and the remainder were greater than 0.5, which is acceptable.

Table 3. Confirmatory factor analysis (CFA) results for measurement model.

Constructs	Items	Loading a	p	R^2	Composite Reliability	Cronbach's Alpha Value	AVE b
FP	FP1	0.619	a	0.037	0.24	0.661	0.48
	FP2	0.672		0.375			
	FP3	0.911		0.331			
	FP4	0.148		0.223			
	FP5	0.15		0.371			
	FP6	0.148		0.408			
	FP7	0.157		0.314			
	FP8	0.075		0.143			
FS	FS1	0.883	a	0.551	1.283	0.824	0.74
	FS2	0.825		0.542			
	FS3	0.742		0.465			
SP	SP1	0.838	a	0.41	0.853	0.679	0.609
	SP2	0.775		0.378			
	SP3	0.54		0.412			
SS	SS1	0.857	a	0.468	0.867	0.661	0.651
	SS2	0.792		0.459			
	SS3	0.522		0.242			

Table 4 contains the means, standard deviations, and correlations for each construct. The mean is a calculation of averages. The standard deviation is a calculation of how spread out the data are from the mean. A low standard deviation shows that the data are concentrated close to the mean, and a high standard deviation shows that the data are dispersed away from the mean. Correlation is a calculation that shows the relationship between two variables. It allows us to determine if there is a high correlation between the observed variables and their related structure variables. For discriminant validity, the square root of the AVE must be greater than the correlation measurements of the variables [53]. Tables 3 and 4 show that the square roots of the AVE values were greater than all of the correlations between each pair of constructs, thus indicating discriminant validity. Therefore, the measurement model had sufficient reliability, convergent validity, and discriminant validity.

Table 4. Means, standard deviations, and correlations.

	Means a	SD b	FP	FS	SP	SS
FP	9.16	4.413	1			
FS	2	2.246	0.39	1		
SP	4.66	2.859	0.295	0.313	1	
SS	4.1	2.595	0.337	0.431	0.543	1

5.2. Structural Model and Hypotheses Testing

The model in Figure 1 was assessed using structural equation modeling, a multivariate analysis tool that is used to test causal relationships [54]. The results are shown in Figure 1 and Table 5. In Figure 1, all the dimensions of functional values revealed their statistical significance as the hypotheses projected. Hypothesis 1 (FP: Functional private value positively affects consumers' opinions toward adopting EVs) proposed that functional private values positively affect consumers' opinions toward adopting EVs. The results showed that performance, monetary, and convenience values had a significant effect on consumers' opinions toward adopting EVs. Hypothesis 2 (FS: Functional societal value positively affects consumers' opinions toward adopting EVs) proposed that functional societal values positively affect consumers' opinions toward adopting EVs. The results showed that image, identification, self-concept, expression of personality, and pursuit of social class membership had a significant effect on consumers' opinions towards adopting EVs. Hypothesis 3 (SP: Symbolic private value positively affects consumers' opinions toward adopting EVs) proposed that symbolic private values positively affect consumers' opinions toward adopting EVs. The results showed that trust, peace of mind, security, and credibility had a significant effect on consumers' opinions towards adopting EVs. Hypothesis 4 (SS: Symbolic societal value positively affects consumers' opinions toward adopting EVs) proposed that symbolic societal values positively affect consumers' opinions toward adopting EVs. The results showed that the social position and identity had a significant effect on consumers' opinions toward adopting EVs. Furthermore, there is a relationship between covariance and correlation. While covariance determines the kind of interaction between two variables, correlation determines the direction and strength of the relationship. Table 5 shows good relations among all the hypotheses.

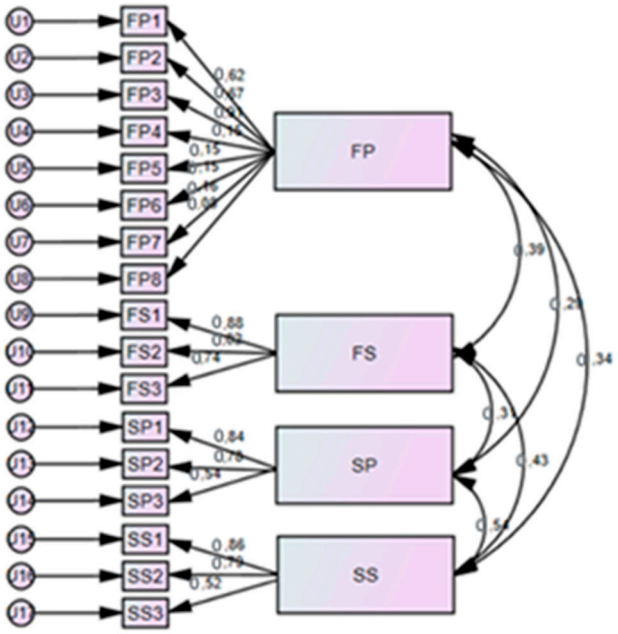

Figure 1. Path diagram.

Table 5. Correlation and covariance.

Path	Correlation	Covariance
	Path Coefficient	**Path Coefficient**
FP SS	0.337	0.326
FP FP	0.39	0.324
FP SP	0.295	0.345
FS SP	0.313	0.297
FS SS	0.431	0.339
SP SS	0.543	0.601

5.3. Gender and Functional Private Value

Crosstab analysis was conducted to evaluate the pattern of association between gender and the functional private value of EVs, as shown in Table 6. The functional private value of EVs was more appealing to female respondents (52.2%) than male respondents (46.3%). Furthermore, the functional private value of EVs was less appealing to male respondents (56.1%) than female respondents (34.5%). In addition, a 5 × 3 chi-square test, shown in Table 7, was conducted to evaluate if there was a statistically significant relationship between gender and the functional private value of EVs. The results revealed a statistically significant relationship between gender and the functional private value of EVs, χ^2 (8, N = 5458) = 70,598 a, $p < 0.0001$.

Table 6. Functional private value of EVs and respondents' gender cross-tabulation.

			What Is Your Gender?			Total
			Male	Female	Prefer Not to Say	
FP	Very appealing	Count	653	736	22	1411
		% within FP	46.3%	52.2%	1.6%	100.0%
		% within What is your gender?	25.7%	26.5%	15.4%	25.9%
	Somewhat appealing	Count	765	811	43	1619
		% within FP	47.3%	50.1%	2.7%	100.0%
		% within What is your gender?	30.2%	29.2%	30.1%	29.7%
	Neutral	Count	830	1038	56	1924
		% within FP	43.1%	54.0%	2.9%	100.0%
		% within What is your gender?	32.7%	37.4%	39.2%	35.3%
	Unappealing	Count	205	143	8	356
		% within FP	57.6%	40.2%	2.2%	100.0%
		% within What is your gender?	8.1%	5.1%	5.6%	6.5%
	Very unappealing	Count	83	51	14	148
		% within FP	56.1%	34.5%	9.5%	100.0%
		% within What is your gender?	3.3%	1.8%	9.8%	2.7%
Total		Count	2536	2779	143	5458
		% within FP	46.5%	50.9%	2.6%	100.0%
		% within What is your gender?	100.0%	100.0%	100.0%	100.0%

Table 7. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	70.598 a	8	3.7352×10^{-12}

a. One cell (6.7%) had an expected count of less than 5. The minimum expected count was 3.88.

5.4. Gender and Functional Societal Value

Crosstab analysis was conducted to evaluate the pattern of association between gender and the functional societal value of EVs, as shown in Table 8. The functional societal value of EVs was more appealing to female respondents (51.8%) than male respondents (46.0%). Furthermore, the functional societal value of EVs was less appealing to male respondents (56.4%) than females (30.9%). In addition, a 5 × 3 chi-square test, shown in Table 9, was conducted to evaluate if there was a statistically significant relationship between gender and the functional societal value of EVs. The results revealed a statistically significant relationship between gender and the functional societal value of EVs, χ^2 (8, N = 5458) = 52,574 a, $p < 0.0001$.

Table 8. Functional societal value of EVs and respondents' gender cross-tabulation.

			What Is Your Gender?			Total
			Male	Female	Prefer Not to Say	
FS	Very appealing	Count	1365	1538	66	2969
		% within FS	46.0%	51.8%	2.2%	100.0%
		% within What is your gender?	53.8%	55.3%	46.2%	54.4%
	Somewhat appealing	Count	797	905	36	1738
		% within FS	45.9%	52.1%	2.1%	100.0%
		% within What is your gender?	31.4%	32.6%	25.2%	31.8%
	Neutral	Count	295	283	28	606
		% within FS	48.7%	46.7%	4.6%	100.0%
		% within What is your gender?	11.6%	10.2%	19.6%	11.1%
	Unappealing	Count	48	36	6	90
		% within FS	53.3%	40.0%	6.7%	100.0%
		% within What is your gender?	1.9%	1.3%	4.2%	1.6%
	Very unappealing	Count	31	17	7	55
		% within FS	56.4%	30.9%	12.7%	100.0%
		% within What is your gender?	1.2%	0.6%	4.9%	1.0%
Total		Count	2536	2779	143	5458
		% within FS	46.5%	50.9%	2.6%	100.0%
		% within What is your gender?	100.0%	100.0%	100.0%	100.0%

Table 9. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	52.574 a	8	1.3039×10^{-8}

a. Two cells (13.3%) had an expected count of less than 5. The minimum expected count was 1.44.

5.5. Gender and Symbolic Private Value

Crosstab analysis was conducted to evaluate the pattern of association between gender and the symbolic private value of EVs, as shown in Table 10. Female (48.8%) and male (49.0%) respondents strongly agreed about the symbolic private value of EVs. Furthermore, male respondents strongly disagreed (58.1%) about the symbolic private value of EVs compared to female (36.9%) respondents. In addition, a 5 × 3 chi-square test, shown in Table 11, was conducted to evaluate if there was a significant relationship between gender and the symbolic private value. The results revealed a statistically significant relationship between gender and the symbolic private value of EVs, χ^2 (8, N = 5458) = 42,180 a, $p < 0.0001$.

Table 10. Symbolic private value of EVs and respondents' gender cross-tabulation.

			What Is Your Gender?			Total
			Male	Female	Prefer Not to Say	
SP	Strongly agree	Count	460	458	21	939
		% within SP	49.0%	48.8%	2.2%	100.0%
		% within What is your gender?	18.1%	16.5%	14.7%	17.2%
	Agree	Count	744	911	30	1685
		% within SP	44.2%	54.1%	1.8%	100.0%
		% within What is your gender?	29.3%	32.8%	21.0%	30.9%
	Neutral	Count	829	981	58	1868
		% within SP	44.4%	52.5%	3.1%	100.0%
		% within What is your gender?	32.7%	35.3%	40.6%	34.2%
	Disagree	Count	377	349	23	749
		% within SP	50.3%	46.6%	3.1%	100.0%
		% within What is your gender?	14.9%	12.6%	16.1%	13.7%
	Strongly disagree	Count	126	80	11	217
		% within SP	58.1%	36.9%	5.1%	100.0%
		% within What is your gender?	5.0%	2.9%	7.7%	4.0%
Total		Count	2536	2779	143	5458
		% within SP	46.5%	50.9%	2.6%	100.0%
		% within What is your gender?	100.0%	100.0%	100.0%	100.0%

Table 11. Chi-square tests.

Value	df	Asymptotic Significance (2-Sided)
42,180 a	8	0.000001

a. Zero cells (0.0%) had an expected count of less than 5. The minimum expected count was 5.69.

5.6. Gender and Symbolic Societal Value

Crosstab analysis was conducted to evaluate the pattern of association between gender and the symbolic societal value of EVs, as shown in Table 12. More female respondents strongly agreed (50.5%) than male respondents (47.3%) about the symbolic societal value of EVs. Furthermore, more male respondents strongly disagreed (60.7%) than female respondents (35.7%) about the symbolic societal value of EVs. In addition, a 5 × 3 chi-square test, shown in Table 13, was conducted to evaluate if there was a significant relationship between gender and the symbolic societal value. The results revealed a statistically significant relationship between gender and the symbolic societal value of EVs, χ^2 (10, N = 5458) = 50,433 a, $p < 0.0001$.

Table 12. Symbolic societal value of EVs and respondents' gender cross-tabulation.

			What Is Your Gender?			Total
			Male	Female	Prefer Not to Say	
SS	Strongly agree	Count	624	666	28	1318
		% within SS	47.3%	50.5%	2.1%	100.0%
		% within What is your gender?	24.6%	24.0%	19.6%	24.2%
	Agree	Count	1013	1295	47	2355
		% within SS	43.0%	55.0%	2.0%	100.0%
		% within What is your gender?	40.0%	46.6%	32.9%	43.2%
	Neutral	Count	648	633	51	1332
		% within SS	48.6%	47.5%	3.8%	100.0%
		% within What is your gender?	25.6%	22.8%	35.7%	24.4%
	Disagree	Count	199	155	14	368
		% within SS	54.1%	42.1%	3.8%	100.0%
		% within What is your gender?	7.9%	5.6%	9.8%	6.7%
	Strongly disagree	Count	51	30	3	84
		% within SS	60.7%	35.7%	3.6%	100.0%
		% within What is your gender?	2.0%	1.1%	2.1%	1.5%
Total		Count	2535	2779	143	5457
		% within SS	46.5%	50.9%	2.6%	100.0%
		% within What is your gender?	100.0%	100.0%	100.0%	100.0%

Table 13. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	50.433 a	8	3.3739×10^{-8}

a. One cell (6.7%) had an expected count of less than 5. The minimum expected count was 2.20.

An analysis of the results demonstrated that the functional private value and the functional societal value more positively affected females' than males' opinions about EVs. Similarly, symbolic private value and symbolic societal value more positively affected females' than males' opinions of EVs.

5.7. Age and Functional Private Value

To assess the pattern of association between age and the functional private value of EVs, a crosstab analysis was conducted, as shown in Table 14. The functional private value of EVs was very appealing to respondents aged 20–29 (41.1%), followed by respondents aged 19 years and below (29.2%), 30–39 (16.1%), 40–49 (8.6%), 50–59 (4.3%), and 60 years and above (0.6%). Furthermore, the functional private value of EVs was very unappealing to respondents aged 60 years and above (15.4%). In addition, a 5 × 6 chi-square test, as shown in Table 15, was conducted to evaluate if there was a statistically significant relationship between age and functional private value of EVs. The results showed a

statistically significant relationship between age and the functional private value of EVs, χ^2 (20, N = 5457) = 72,453 a, $p < 0.0001$.

Table 14. Functional private value of EVs and respondents' age cross-tabulation.

			What Is Your Age?						Total
			19 Years and Below	20–29 Years	30–39 Years	40–49 Years	50–59 Years	60 Years and Above	
FP	Very appealing	Count	413	581	228	121	61	8	1412
		% within FP	29.2%	41.1%	16.1%	8.6%	4.3%	0.6%	100.0%
		% within What is your age?	26.6%	25.9%	28.8%	23.0%	21.0%	15.4%	25.9%
	Somewhat appealing	Count	433	678	232	162	97	17	1619
		% within FP	26.7%	41.9%	14.3%	10.0%	6.0%	1.1%	100.0%
		% within What is your age?	27.9%	30.2%	29.3%	30.7%	33.3%	32.7%	29.7%
	Neutral	Count	533	781	273	207	112	17	1923
		% within FP	27.7%	40.6%	14.2%	10.8%	5.8%	0.9%	100.0%
		% within What is your age?	34.3%	34.8%	34.5%	39.3%	38.5%	32.7%	35.2%
	Unappealing	Count	112	155	43	27	17	2	356
		% within FP	31.5%	43.5%	12.1%	7.6%	4.8%	0.6%	100.0%
		% within What is your age?	7.2%	6.9%	5.4%	5.1%	5.8%	3.8%	6.5%
	Very unappealing	Count	63	47	15	10	4	8	147
		% within FP	42.9%	32.0%	10.2%	6.8%	2.7%	5.4%	100.0%
		% within What is your age?	4.1%	2.1%	1.9%	1.9%	1.4%	15.4%	2.7%
Total		Count	1554	2242	791	527	291	52	5457
		% within FP	28.5%	41.1%	14.5%	9.7%	5.3%	1.0%	100.0%
		% within What is your age?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 15. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	72.453 a	20	7.2056×10^{-8}

a. Two cells (6.7%) had an expected count of less than 5. The minimum expected count was 1.40.

5.8. Age and Functional Societal Value

To assess the pattern of association between age and the functional societal value of EVs, a crosstab analysis was conducted, as shown in Table 16. The functional societal value of EVs was very appealing to respondents aged 20–29 (40.8%), followed by respondents 19 years and below (29.5%), 30–39 (14.4%), 40–49 (9.5%), 50–59 (5.0%), and 60 years and above (0.7%). Furthermore, the functional societal value of EVs was very unappealing to respondents aged 60 years and above (9.6%). In addition, a 5 × 6 chi-square test, as shown in Table 17, was conducted to evaluate if there was a statistically significant relationship between age and the functional societal value of EVs. The results showed a statistically significant relationship between age and the functional societal value of EVs, χ^2 (20, N = 5457) = 106,360 a, $p < 0.0001 < 0.05$.

Table 16. Functional societal value of EVs and respondents' age cross-tabulation.

			What Is Your Age?						Total
			19 Years and Below	20–29 Years	30–39 Years	40–49 Years	50–59 Years	60 Years and Above	
FS	Very appealing	Count	875	1212	429	282	149	22	2969
		% within FS	29.5%	40.8%	14.4%	9.5%	5.0%	0.7%	100.0%
		% within What is your age?	56.3%	54.1%	54.2%	53.5%	51.2%	42.3%	54.4%
	Somewhat appealing	Count	407	742	267	192	115	14	1737
		% within FS	23.4%	42.7%	15.4%	11.1%	6.6%	0.8%	100.0%
		% within What is your age?	26.2%	33.1%	33.8%	36.4%	39.5%	26.9%	31.8%
	Neutral	Count	215	232	76	49	24	10	606
		% within FS	35.5%	38.3%	12.5%	8.1%	4.0%	1.7%	100.0%
		% within What is your age?	13.8%	10.3%	9.6%	9.3%	8.2%	19.2%	11.1%
	Unappealing	Count	38	33	12	3	3	1	90
		% within FS	42.2%	36.7%	13.3%	3.3%	3.3%	1.1%	100.0%
		% within What is your age?	2.4%	1.5%	1.5%	0.6%	1.0%	1.9%	1.6%
	Very unappealing	Count	19	23	7	1	0	5	55
		% within FS	34.5%	41.8%	12.7%	1.8%	0.0%	9.1%	100.0%
		% within What is your age?	1.2%	1.0%	0.9%	0.2%	0.0%	9.6%	1.0%
Total		Count	1554	2242	791	527	291	52	5457
		% within FS	28.5%	41.1%	14.5%	9.7%	5.3%	1.0%	100.0%
		% within What is your age?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 17. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	106,360 a	20	9.011×10^{-14}

a. Four cells (13.3%) had an expected count of less than 5. The minimum expected count was 0.52.

5.9. Age and Symbolic Private Value

To assess the pattern of association between age and the symbolic private value of EVs, a crosstab analysis was conducted, as shown in Table 18. The symbolic private value of EVs was very appealing to respondents aged 20–29 (38.7%) followed by respondents 19 years and below (34.7%), 30–39 (12.6%), 40–49 (8.6%), 50–59 (4.4%), and 60 years and above (0.9%). Furthermore, the symbolic private value of EVs was very unappealing to respondents aged 60 years and above (13.5%). In addition, a 5 × 6 chi-square test, as shown in Table 19, was conducted to evaluate if there was a statistically significant relationship between age and symbolic private value of EVs. The results showed a statistically significant relationship between age and the symbolic private value of EVs, χ^2 (20, N = 5457) = 99,448 a, $p < 0.0001$.

Table 18. Symbolic private value of EVs and respondents' age cross-tabulation.

			What Is Your Age?						Total
			19 Years and Below	20–29 Years	30–39 Years	40–49 Years	50–59 Years	60 Years and Above	
SP	Strongly agree	Count	326	364	120	81	41	8	940
		% within SP	34.7%	38.7%	12.8%	8.6%	4.4%	0.9%	100.0%
		% within What is your age?	21.0%	16.2%	15.2%	15.4%	14.1%	15.4%	17.2%
	Agree	Count	402	693	285	195	99	11	1685
		% within SP	23.9%	41.1%	16.9%	11.6%	5.9%	0.7%	100.0%
		% within What is your age?	25.9%	30.9%	36.0%	37.0%	34.0%	21.2%	30.9%
	Neutral	Count	596	759	249	159	87	17	1867
		% within SP	31.9%	40.7%	13.3%	8.5%	4.7%	0.9%	100.0%
		% within What is your age?	38.4%	33.9%	31.5%	30.2%	29.9%	32.7%	34.2%
	Disagree	Count	171	327	103	84	54	9	748
		% within SP	22.9%	43.7%	13.8%	11.2%	7.2%	1.2%	100.0%
		% within What is your age?	11.0%	14.6%	13.0%	15.9%	18.6%	17.3%	13.7%
	Strongly disagree	Count	59	99	34	8	10	7	217
		% within SP	27.2%	45.6%	15.7%	3.7%	4.6%	3.2%	100.0%
		% within What is your age?	3.8%	4.4%	4.3%	1.5%	3.4%	13.5%	4.0%
Total		Count	1554	2242	791	527	291	52	5457
		% within SP	28.5%	41.1%	14.5%	9.7%	5.3%	1.0%	100.0%
		% within What is your age?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 19. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	99,448 a	20	9.011×10^{-14}

a. One cell (3.3%) had an expected count of less than 5. The minimum expected count was 2.07.

5.10. Age and Symbolic Societal Value

To assess the pattern of association between age and the symbolic societal value of EVs, a crosstab analysis was conducted, as shown in Table 20. Respondents aged 20–29 (39.7%) strongly agreed about the symbolic societal value of EVs followed by respondents 19 years and below (31.9%), 30–39 (13.1%), 40–49 (10.4%), 50–59 (3.9%), and 60 years and above (1.0%). Furthermore, respondents aged 60 years and above (5.8%) strongly disagree about the symbolic societal value of EVs. In addition, a 5 × 6 chi-square test, as shown in Table 21, was conducted to evaluate if there was a statistically significant relationship between age and symbolic societal value of EVs. The results showed a statistically significant relationship between age and the symbolic societal value of EVs, χ^2 (20, N = 5456) = 87,951 a, $p < 0.0001$.

Table 20. Symbolic societal value of EVs and respondents' age cross-tabulation.

			What Is Your Age?						Total
			19 Years and Below	20–29 Years	30–39 Years	40–49 Years	50–59 Years	60 Years and Above	
SS	Strongly agree	Count	421	524	173	137	51	13	1319
		% within SS	31.9%	39.7%	13.1%	10.4%	3.9%	1.0%	100.0%
		% within What is your age?	27.1%	23.4%	21.%	26.0%	17.5%	25.0%	24.2%
	Agree	Count	573	969	395	247	153	17	2354
		% within SS	24.3%	41.2%	16.8%	10.5%	6.5%	0.7%	100.0%
		% within What is your age?	36.9%	43.2%	49.9%	46.9%	52.6%	32.7%	43.1%
	Neutral	Count	446	530	164	110	66	16	1332
		% within SS	33.5%	39.8%	12.3%	8.3%	5.0%	1.2%	100.0%
		% within What is your age?	28.7%	23.7%	20.7%	20.9%	22.7%	30.8%	24.4%
	Disagree	Count	93	174	48	32	18	3	368
		% within SS	25.3%	47.3%	13.0%	8.7%	4.9%	0.8%	100.0%
		% within What is your age?	6.0%	7.8%	6.1%	6.1%	6.2%	5.8%	6.7%
	Strongly disagree	Count	21	44	11	1	3	3	83
		% within SS	25.3%	53.0%	13.3%	1.2%	3.6%	3.6%	100.0%
		% within What is your age?	1.4%	2.0%	1.4%	0.2%	1.0%	5.8%	1.5%
Total		Count	1554	2241	791	527	291	52	5456
		% within SS	28.5%	41.1%	14.5%	9.7%	5.3%	1.0%	100.0%
		% within What is your age?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 21. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	87,951 a	20	1.6874×10^{-10}

a. Three cells (10.0%) had an expected count of less than 5. The minimum expected count was 0.79.

An analysis of the results demonstrated that respondents aged 20–29, followed by respondents aged 19 years and below, 30–39, 40–49, 50–59, and 60 years and above, found EVs very appealing and strongly agreed about the functional private value, the functional societal value, the symbolic private value, and the symbolic societal value of EVs.

5.11. Emirates and Functional Private Value

Crosstab analysis was conducted to evaluate the pattern of association between the emirate where respondents reside and the functional private value of EVs, as shown in Table 22. The functional private value of EVs was very appealing to respondents residing in Abu Dhabi (48.6%), followed by the respondents residing in Dubai (20.3%), Sharjah (14.7%), Ajman (6.9%), Fujairah (4.5%), Ras al-Khaimah (4.4%), and Umm al-Quwain (0.7%). Furthermore, the functional private value of EVs was very unappealing to respondents residing in Umm al-Quwain (7.1%). In addition, a 5 × 7 chi-square test, shown in Table 23, was conducted to evaluate if there was a statistically significant relationship between the emirates where the respondents reside and the functional private value of EVs. The results showed a statistically significant relationship between the emirates where the respondents reside and the functional private value of EVs, χ^2 (24, N = 5459) = 57.046 a, p = 0.000165.

Table 22. Functional private value for EVs and respondents' emirates cross-tabulation.

			Where Do You Live?							Total
			Abu Dhabi	Dubai	Ras al-Khaimah	Umm al-Quwain	Sharjah	Fujairah	Ajman	
FP	Very appealing	Count	686	286	62	10	207	64	97	1412
		% within FP	48.6%	20.3%	4.4%	0.7%	14.7%	4.5%	6.9%	100.0%
		% within Where do you live?	27.3%	26.4%	27.2%	14.3%	26.0%	26.2%	18.6%	25.9%
	Somewhat appealing	Count	742	304	77	21	231	86	158	1619
		% within FP	45.8%	18.8%	4.8%	1.3%	14.3%	5.3%	9.8%	100.0%
		% within Where do you live?	29.5%	28.0%	33.8%	30.0%	29.1%	35.2%	30.3%	29.7%
	Neutral	Count	883	380	65	27	285	68	216	1924
		% within FP	45.9%	19.8%	3.4%	1.4%	14.8%	3.5%	11.2%	100.0%
		% within Where do you live?	35.1%	35.0%	28.5%	38.6%	35.8%	27.9%	41.4%	35.2%
	Unappealing	Count	155	70	16	7	53	20	35	356
		% within FP	43.5%	19.7%	4.5%	2.0%	14.9%	5.6%	9.8%	100.0%
		% within Where do you live?	6.2%	6.5%	7.0%	10.0%	6.7%	8.2%	6.7%	6.5%
	Very unappealing	Count	49	45	8	5	19	6	16	148
		% within FP	33.1%	30.4%	5.4%	3.4%	12.8%	4.1%	10.8%	100.0%
		% within Where do you live?	1.9%	4.1%	3.5%	7.1%	2.4%	2.5%	3.1%	2.7%
Total		Count	2515	1085	228	70	795	244	522	5459
		% within FP	46.1%	19.9%	4.2%	1.3%	14.6%	4.5%	9.6%	100.0%

Table 23. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	57.046 a	24	0.000165

a. Two cells (5.7%) had an expected count of less than 5. The minimum expected count was 1.90.

5.12. Emirates and Functional Societal Value

Crosstab analysis was conducted to evaluate the pattern of association between the emirate where respondents reside and the functional societal value of EVs, as shown in Table 24. The functional societal value of EVs was very appealing to respondents residing in Abu Dhabi (47.2%) followed by the respondents residing in Dubai (20.4%), Sharjah (13.8%), Ajman (8.7%), Ras al-Khaimah (4.5%), Fujairah (4.4%), and Umm al-Quwain (1.1%). Furthermore, the functional societal value of EVs was very unappealing to respondents residing in Umm al-Quwain (2.9%). In addition, a 5 × 7 chi-square test, shown in Table 25, was used to evaluate if there was a statistically significant relationship between the emirates where the respondents reside and the functional societal value of EVs. The results showed a statistically significant relationship between the emirates where the respondents reside and the functional societal value of EVs, χ^2 (24, N = 5459) = 41,072 a, p = 0.016.

Table 24. Functional societal value of EVs and respondents' emirates cross-tabulation.

			Where Do You Live?							Total
			Abu Dhabi	Dubai	Ras al-Khaimah	Umm al-Quwain	Sharjah	Fujairah	Ajman	
FS	Very appealing	Count	1403	605	133	32	409	131	257	2970
		% within FS	47.2%	20.4%	4.5%	1.1%	13.8%	4.4%	8.7%	100.0%
		% within Where do you live?	55.8%	55.8%	58.3%	45.7%	51.4%	53.7%	49.2%	54.4%
	Somewhat appealing	Count	791	309	69	22	273	85	189	1738
		% within FS	45.5%	17.8%	4.0%	1.3%	15.7%	4.9%	10.9%	100.0%
		% within Where do you live?	31.5%	28.5%	30.3%	31.4%	34.3%	34.8%	36.2%	31.8%
	Neutral	Count	268	131	19	11	91	22	64	606
		% within FS	44.2%	21.6%	3.1%	1.8%	15.0%	3.6%	10.6%	100.0%
		% within Where do you live?	10.7%	12.1%	8.3%	15.7%	11.4%	9.0%	12.3%	11.1%
	Unappealing	Count	37	20	5	3	15	4	6	90
		% within FS	41.1%	22.2%	5.6%	3.3%	16.7%	4.4%	6.7%	100.0%
		% within Where do you live?	1.5%	1.8%	2.2%	4.3%	1.9%	1.6%	1.1%	1.6%
	Very unappealing	Count	16	20	2	2	7	2	6	55
		% within FS	29.1%	36.4%	3.6%	3.6%	12.7%	3.6%	10.9%	100.0%
		% within Where do you live?	0.6%	1.8%	0.9%	2.9%	0.9%	0.8%	1.1%	1.0%
Total		Count	2515	1085	228	70	795	244	522	5459
		% within FS	46.1%	19.9%	4.2%	1.3%	14.6%	4.5%	9.6%	100.0%
		% within Where do you live?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 25. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	41,072 a	24	0.016

a. Six cells (17.1%) had an expected count of less than 5. The minimum expected count was 0.71.

5.13. Emirates and Symbolic Private Value

Crosstab analysis was conducted to evaluate the pattern of association between the emirate where respondents reside and the symbolic private value of EVs, as shown in Table 26. Respondents residing in Abu Dhabi (46.7%) strongly agreed about the symbolic private value of EVs, followed by respondents residing in Dubai (22.6%), Sharjah (13.0%), Ajman (7.2%), Ras al-Khaimah (4.8%), Fujairah (4.7%), and Umm al-Quwain (1.1%). In addition, a 5 × 7 chi-square test, shown in Table 27, was conducted to evaluate if there was a statistically significant relationship between the emirates where the respondents reside and the symbolic private value of EVs. The results showed a statistically significant relationship between the emirates where the respondents reside and the symbolic private value of EVs, χ^2 (24, N = 5459) = 59.850 a, p = 0.000067.

Table 26. Symbolic private value of EVs and respondents' emirates cross-tabulation.

			Where Do You Live?							Total
			Abu Dhabi	Dubai	Ras al-Khaimah	Umm al-Quwain	Sharjah	Fujairah	Ajman	
SP	Strongly agree	Count	439	212	45	10	122	44	68	940
		% within SP	46.7%	22.6%	4.8%	1.1%	13.0%	4.7%	7.2%	100.0%
		% within Where do you live?	17.5%	19.5%	19.7%	14.3%	15.3%	18.0%	13.0%	17.2%
	Agree	Count	758	305	79	28	245	75	195	1685
		% within SP	45.0%	18.1%	4.7%	1.7%	14.5%	4.5%	11.6%	100.0%
		% within Where do you live?	30.1%	28.1%	34.6%	40.0%	30.8%	30.7%	37.4%	30.9%
	Neutral	Count	850	350	79	25	311	88	165	1868
		% within SP	45.5%	18.7%	4.2%	1.3%	16.6%	4.7%	8.8%	100.0%
		% within Where do you live?	33.8%	32.3%	34.6%	35.7%	39.1%	36.1%	31.6%	34.2%
	Disagree	Count	369	158	17	4	97	27	77	749
		% within SP	49.3%	21.1%	2.3%	0.5%	13.0%	3.6%	10.3%	100.0%
		% within Where do you live?	14.7%	14.6%	7.5%	5.7%	12.2%	11.1%	14.8%	13.7%
	Strongly disagree	Count	99	60	8	3	20	10	17	217
		% within SP	45.6%	27.6%	3.7%	1.4%	9.2%	4.6%	7.8%	100.0%
		% within Where do you live?	3.9%	5.5%	3.5%	4.3%	2.5%	4.1%	3.3%	4.0%
Total		Count	2515	1085	228	70	795	244	522	5459
		% within SP	46.1%	19.9%	4.2%	1.3%	14.6%	4.5%	9.6%	100.0%
		% within Where do you live?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 27. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	59.850 a	24	0.000067

a. One cell (2.9%) had an expected count of less than 5. The minimum expected count was 2.78.

5.14. Emirates and Symbolic Societal Value

Crosstab analysis was conducted to evaluate the pattern of association between the emirate where respondents reside and the symbolic societal value of EVs, as shown in Table 28. Respondents residing in Abu Dhabi (45.5%) strongly agreed about the symbolic societal value of EVs, followed by respondents residing in Dubai (22.0%), Sharjah (13.5%), Ajman (7.4%), Fujairah (5.3%), Ras al-Khaimah (4.9%), and Umm al-Quwain (1.5%). In addition, a 5 × 7 chi-square test, shown in Table 29, was conducted to evaluate if there was a statistically significant relationship between the emirates where the respondents reside and the symbolic societal value of EVs. The results showed a statistically significant relationship between the emirates where the respondents reside and the symbolic societal value of EVs (24, N = 5459) = 54.591 a, p = 0.000355.

Table 28. Symbolic societal value of EVs and respondents' emirates cross-tabulation.

			Where Do You Live?							Total
			Abu Dhabi	Dubai	Ras al-Khaimah	Umm al-Quwain	Sharjah	Fujairah	Ajman	
SS	Strongly agree	Count	600	290	64	20	178	70	97	1319
		% within SS	45.5%	22.0%	4.9%	1.5%	13.5%	5.3%	7.4%	100.0%
		% within Where do you live?	23.9%	26.7%	28.1%	28.6%	22.4%	28.7%	18.6%	24.2%
	Agree	Count	1096	429	110	23	341	98	258	2355
		% within SS	46.5%	18.2%	4.7%	1.0%	14.5%	4.2%	11.0%	100.0%
		% within Where do you live?	43.6%	39.5%	48.2%	32.9%	42.9%	40.2%	49.4%	43.1%
	Neutral	Count	618	250	44	17	216	59	128	1332
		% within SS	46.4%	18.8%	3.3%	1.3%	16.2%	4.4%	9.6%	100.0%
		% within Where do you live?	24.6%	23.0%	19.3%	24.3%	27.2%	24.2%	24.5%	24.4%
	Disagree	Count	165	91	6	7	52	15	32	368
		% within SS	44.8%	24.7%	1.6%	1.9%	14.1%	4.1%	8.7%	100.0%
		% within Where do you live?	6.6%	8.4%	2.6%	10.0%	6.5%	6.1%	6.1%	6.7%
	Strongly disagree	Count	35	25	4	3	8	2	7	84
		% within SS	41.7%	29.8%	4.8%	3.6%	9.5%	2.4%	8.3%	100.0%
		% within Where do you live?	1.4%	2.3%	1.8%	4.3%	1.0%	0.8%	1.3%	1.5%
Total		Count	2514	1085	228	70	795	244	522	5458
		% within SS	46.1%	19.9%	4.2%	1.3%	14.6%	4.5%	9.6%	100.0%
		% within Where do you live?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 29. Chi-square tests.

	Value	df	Asymptotic Significance (2-Sided)
Pearson Chi-Square	54.591 a	24	0.000355

a. Four cells (11.4%) had an expected count of less than 5. The minimum expected count was 1.08.

An analysis of the results demonstrated that respondents residing in Abu Dhabi, followed by respondents residing in Dubai, Sharjah, Ajman, Fujairah, Ras al-Khaimah, and Umm al-Quwain, found EVs very appealing and strongly agreed about the functional private value, the functional societal value, the symbolic private value, and the symbolic societal value of EVs.

6. Conclusions

The purpose of the study was to examine consumers' opinions toward adopting EVs from the functional value (i.e., the utility or benefit attained by consumers from the functions or tangible features associated with EVs) and symbolic value (i.e., the social meaning that consumers associate with EVs) perspectives. The functional private values for the study included saving money on petroleum and car maintenance, lower vehicle cost, lower charging time and convenient charging options, longer driving range, and reliable technology. The functional societal values for the study included reducing air pollution, global warming, and the use of petroleum. The symbolic private values for the study included self-identity, social status, and concern for the environment. The symbolic societal values for the study included inspiring other consumers, sending message to governments and oil companies, and other people's opinion.

The findings showed that, first, the functional private and societal values, and the symbolic private and societal values more positively affected females' than males' opinions about EVs. This is a significant finding given that males are the primary decision-makers regarding vehicle purchases in the UAE. This raises the importance for EV manufacturers to target females in the UAE as potential adopters. In so doing, manufacturers can create greater opportunities for females to become the decision-makers regarding the purchase of EVs and, therefore, increase adoption. Second, respondents aged 20–29, followed by respondents aged 19 years and below, 30–39, 40–49, 50–59, and 60 years and above, found EVs very appealing and strongly agreed about the functional private and societal values, and the symbolic private and societal values about EVs. This demonstrates that younger people are those that should be targeted by manufactures. This raises important issues about purchase price, which must be low enough to attract first-time buyers. Furthermore, as more young people adopt the technology, it is more likely that they will not return to conventional vehicles, thus making the transition to EVs. Third, respondents residing in Abu Dhabi, followed by respondents residing in Dubai, Sharjah, Ajman, Fujairah, Ras al-Khaimah, and Umm al-Quwain, found EVs very appealing and strongly agreed about the functional private and societal values, and the symbolic private and societal values about EVs. This demonstrates the importance of developing the current infrastructure in the UAE to facilitate the adoption of EVs. Currently, the largest number of charging stations is in Dubai followed by Abu Dhabi, while the northern Emirates lag behind. It is imperative for the government of Abu Dhabi to increase the number of charging stations since the potential for adoption of EVs among residents in Abu Dhabi City is greater than any other emirate. Further development of infrastructure is also required in all the emirates, especially in the norther part of the country, to attract potential adopters.

The research confirms the findings from other studies that examined adopting EVs in the UAE and other countries. Elghanam et al. assessed the effectiveness of functional aspects of EVs such as wireless charging systems that effectively meet demand of EV traffic in major cities in the UAE such as Dubai and Sharjah. The authors demonstrated the importance of developing EV charging infrastructure to ameliorate concerns that consumers have about the limits of power capacity of EV batteries [55]. Alotaibi et al. investigated the cost effectiveness of adopting alternative technologies such as EVs in desert regions such as the GCC that pose a challenge to such technologies. Here, the authors demonstrated the functional concerns that consumers have when taking into consideration not only the costs associated with driving EVs but also how well EVs perform in desert regions [56]. Huiming and Yuning developed a model to probe the relationship among perceived functional and symbolic values, consumer satisfaction, and intent to purchase EVs. The authors found that

functional and symbolic values, with symbolic value playing a greater role, and customer satisfaction have a positive effect on the intention to purchase EVs [57].

This study provides guidelines and implications for promoting EVs in the UAE. First, the utility or benefit attained by consumers from the functions or tangible features associated with EVs remain a top priority. Marketing proposals must bring attention to the salient attributes of EVs such as cost (purchase, operation, and maintenance), convenience (charging and range), and reliability that are distinct from conventional vehicles. In addition, there are other functional attributes that affect society such as cleaner air, slowing the pace of climate change, and relying less on fossil fuels. Such benefits may be buttressed by relevant financial incentives from government institutions or corporations, the further development of infrastructure on the national scale, and the continual improvements of the technology. Second, the symbolic or social meaning that consumers associate with EVs are crucial for affecting their opinions toward EVs and ultimately adoption. Here, marketing schemes play an important role. Focus must be placed on unique EV characteristics such as their environmental friendliness, as well as on consumers that regard themselves as pro-environment, anti-big oil corporations, and "making a difference" by behaving more responsibly.

7. Limitations and Future Studies

There were some limitations to the research. First, the results of the research are tentative given that consumers' opinions regarding EVs are in constant flux as the industry continues to develop. More studies are needed to determine the extent to which consumers' opinions are changing. Second, the study may be developed to include more specific variables such as brand preference as more automobile manufacturers release EV models. Third, the results from the research are mainly based on data collected from consumers in the UAE. This may restrict the generalizability of findings. Fourth, future studies that include other countries would be beneficial in terms of making comparisons, as well as understanding consumers' opinions toward adopting EVs at multiple scales. Fifth, research on consumers' opinions regarding EVs would benefit from exploring some of the environmental drawbacks associated with adopting EVs such as the disposal of batteries and the increase in the use of electric energy. Such crucial aspects may have an impact on consumers' opinions toward adopting EVs.

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