THE RELATIONSHIP BETWEEN PERSONALITY AND CONSUMER BEHAVIOR BUYING PATTERNS WITHIN THE AUTOMOBILE INDUSTRY

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ABSTRACT

The automobile industry is an enormously competitive and complex landscape. Auto dealerships compete to gain new customers, and advertise heavily to retain existing customers for repeat purchases. Differing forms of advertising are used for dealerships to achieve an advantage over the competition including, television, radio, print, outdoor, and word-of-mouth communications. Persuading a customer to become, and remain brand loyal, to a specific make, or model of a car, is challenging, but this continued cash stream back into the dealership is a profitable source of revenue that derives from these repeat customers. This paper examines the Big Five personality traits taken from the Mini-International Personality Item Pool (Mini-IPIP) (Donnellan et al., 2006) within a 33-item automotive questionnaire that examines the overall buying experiences of the participants such as the likelihood to recommend a brand, the likelihood to repurchase a brand, type of ownership (purchase versus lease), and includes prior brand repeat ownership information. Demographic variables are additionally accounted for in the overall automobile buying experience, which includes age, gender, level of education, marital status, number of children, and the annual household income of survey respondents. Significant statistical analysis was found in all areas.

JEL: M30, M31

KEYWORDS: Consumer Research, Marketing, Brand Preference

INTRODUCTION

The automobile buying experience is an occurrence that involves comparison-shopping through local car dealerships, automobile websites, and word-of-mouth communications. Communicating with car dealer sales representatives on which type of vehicle to buy can result in a tedious buying experience. Moreover, buying a car is an important decision that consumers make several times during their lifetime. During the car buying process many questions come up such as which brand of car to purchase, what type, make, or model of vehicle to purchase, and whether or not, to lease or own the car (Caribbean Business, 2013). This paper analyzes consumer behavior buying patterns within the automobile industry, specifically looking at the likelihood to recommend a brand, the likelihood to repurchase a brand, previous brand ownership, and type of ownership; also, the authors investigate whether specific demographic variables and the individual personality characteristics of conscientiousness, agreeableness, neuroticism, openness to new experiences, and extraversion. The demographic information collected contained a wide variety of information regarding the characteristics of participants, which included age, level of education, marital status, ethnicity, gender, family size, and annual household income. All data collected in this study was in years 2012 – 2014 with 488 working professional participants in the Houston, Texas area.

To define the variables more in detail, demographic variables were also taken into consideration. Information was collected on the demographic characteristics of participants. Age was categorized as 18-25, 26-35, 36-45, 46-55, 56-65 and 65+ years; however, only 9 respondents were ages 65+ so the latter two

categories were combined for this analysis. Level of education was collected using the categories some high school, high school diploma, some college, four-year college degree, and graduate degree. Only 5 respondents had some high school, so the first two categories were combined into a single "high school" category. Marital status was collected as single, married, divorced, widowed, and in a relationship. Only 5 respondents were widowed so this group was combined with divorced for analysis purposes. A number of children were collected as; none, 1-2, 3-4 or 5+ but only 3 respondents had 5 or more and so this was combined with the previous category to give 3+. Demographic information was also collected on gender, ethnicity (White, Hispanic, Asian, African- American or Other), and annual household income (< $35,000, $35,000-$74,999. $75,000-$124,999, $125,000-$199,999 or $200,000+). Personality was assessed using the *Mini-International Personality Item Pool (Mini-IPIP)* (Donnellan et al., 2006), which comprises of 5 domains, including conscientiousness, agreeableness, neuroticism, openness to new experiences, and extraversion. Automotive ownership behavior was assessed using 4 different items. Type of ownership was categorized as purchase, or lease. The likelihood of recommending, or repurchasing the current brand, was assessed using a 10 point scale where 0 = not likely at all and 10 = extremely likely. The number of previous automobiles of the same brand previously owned, or leased was categorized as none, 1, 2 or 3+.

The results of the analysis revealed differences in each of the following areas: (1) personality characteristics and likelihood of recommending a brand; (2) demographic characteristics and likelihood of recommending a brand; (3) personality characteristics and likelihood of repurchasing a brand; (4) demographic characteristics and likelihood of repurchasing a brand; (5) personality characteristics and type of ownership; (6) demographic characteristics and type of ownership; (7) personality characteristics and previous brand ownership; and (8) demographic characteristics and previous brand ownership. The results of the analysis showed differences in demographic characteristics, and type of ownership; personality characteristics, and type of ownership; demographic characteristics, and likelihood of recommending a brand; personality characteristics, and likelihood of recommending a brand; demographic characteristics, and likelihood of repurchasing a brand; personality characteristics and likelihood of repurchasing a brand; demographic characteristics, and previous brand ownership; and personality characteristics, and previous brand ownership. The remainder of this document is organized into the following sections including, literature review, data and methodology, results, concluding comments, references, acknowledgements, and biography of authors.

LITERATURE REVIEW

Although there were no exact matches in the literature on what specifically this study was about, there were several articles found that had similar research areas including consumer attitudes, brand loyal customers, customer satisfaction, customer relationship commitment, personality in buying patterns, repeat customer analysis, and relationship marketing. Bodey and Grace (2007) analyzed personality characteristics on consumer attitudes. Consumer's attitude towards complaining about a product had positive effects on the tendency of the consumer to complain. Li et al., (2012) found that customer loyalty is a huge component to a company's overall success. Faithful customers are less price sensitive, and more likely to purchase regularly. Loyal customers provided a steady revenue stream for companies. Relationship quality reduced buyer's remorse, and reinforced the relationship between the shopper, and the dealer.

Trust, price deals, commitment, and education level were positive predictors of word-of-mouth communications. Customer satisfaction, commitment, and price deals were positive predictors of purchase intentions. Likewise, trust, commitment, and price deals, were significant influences on customer loyalty. Customer satisfaction was also a positive influence towards customer purchase intentions (Li et al., 2012). Srivastava and Owens (2010) discovered that new brands entering the market, increased use of sales promotions, unconventional forms of distribution, and a decrease in advertising made maintaining brand commitment progressively difficult. Repeat customers could give a vital competitive advantage to organizations. Loyal customers lower a firm's acquisition cost (Armstrong & Kotler, 2000). Customer

loyalty is defined as the relationship between relative attitude, and repeat patronage (Heere & Dickson, 2008). Commitment to a relationship is a relatively stable, robust, and passionate psychological state, or approach, towards maintaining that relationship (Chakraborty, Srivastava, & Marshall, 2007).

Affective commitment existed when one had the yearning to maintain that association based on a generalized sense of positive regard for, or liking of, and a gratification within that relationship (Matilla, 2006). Calculative commitment occurred when one needed to maintain a relationship due to the anticipated costs associated with leaving that relationship (Matilla, 2006). Consumers' commitment to a brand tended to be more affective than calculative (Matilla, 2006; Evanschitzky et al., 2006). Bator and Cialdini, (2006) showed that preference for consistency, or coherence, of a person is the desire to be consistent within his/her own responses internally, the desire to be perceived as consistent publicly among others, and the desire that others be consistent. Cialdini et al. (1995) found a positive correlation between low-preference for consistency, and the personality trait of openness to new experiences. High-preference for consistency folks weighed commitments, choices, and previous expectations greater than low-preference for consistency individuals. The personality traits of agreeableness, and conscientiousness were found to have a positive relationship with a preference for consistency. Resistance to change and brand commitment were positively related. True loyalty is commitment based. Constancy measures, such as repeat purchases, can be disingenuous due to overlooking such factors as listlessness, and habit (Srivastava & Owens, 2010).

Since the early 1990s, there has been a growing awareness of the importance of ongoing relationships in such assorted areas as marketing channels, and relationship marketing (Hewett & Bearden, 2001; Hakansson & Snehota, 1995). Young and Albaum (2003) found that Americans feel that direct selling techniques were more risky over Australians. Direct selling can be defined as personal contact between a salesperson, and a consumer, away from fixed business locations, as within the Internet. In the United States trust in general in direct sellers was more conspicuous. Loyalty is the extent to which the customer desires to sustain a long-term relationship with the firm (Fullerton, 2003). One stimulus for customers to engage in relational exchanges is to save money (Peltier & Westfall, 2000). Companies habitually rewarded loyal customers with a distinctive price offer, however, competitors could easily match this, and therefore, it did not become an ongoing competitive advantage. Structural bonding tactics increased the switching costs, and this level of relationship marketing, which pertained to both partners desiring to partner in order to achieve something, ranked highest in the relationship bonding tactics, and conferred the largest likelihood for firms to create a long-term competitive advantage (Ibrahim & Najjar, 2008).

Relationship bonding tactics are helpful in improving customers' loyalty, and relationship marketing tactics could efficiently increase the awareness of customers' trust, and commitment to the brand and/or firm (Armstrong & Kotler, 2000; Gruen et al., 2000). Homburg and Giering (2001) asserted that customer's personality tempered the expansion of a relationship strategy, and it also demonstrated that the strength of a relationship between fulfillment, and customer constancy, was influenced by the individual's personal characteristics. McAdams suggested (2001) that an individual's personality predisposition should encompass a three-tier effect, including personality traits, personal concerns, and life stories. Baumgartner (2002) suggested the factors that make up an individual's consumer personology were a person's disposition, goal-striving initiatives, and narrative entities.

DATA AND METHODOLOGY

The current research aimed to examine the relationship between personality, and consumer buying behavior patterns within the automobile industry. The authors administered a 33-item questionnaire in person and digitally. The subjects were working professionals in the Houston, Texas metropolitan area. The sample size was 488 subjects and the data was collected over the years 2012 – 2014. Consumer buying behavior was assessed using 4 different items. Type of ownership was categorized as purchase or lease. The likelihood of recommending, or repurchasing the current brand, was assessed using a 10 point scale where

0 = not likely at all and 10 = extremely likely. The number of previous automobiles of the same brand previously owned, or leased, was categorized as none, 1, 2 or 3+. The personality assessment instrument used was the *Mini-International Personality Item Pool Mini-IPIP* (Donnellan et al., 2006) that measures the *Big Five* (Costa & McCrae, 1992) personality traits, which included conscientiousness, agreeableness, neuroticism, openness to new experiences, and extraversion. Information on the demographic characteristics of respondents was also obtained (age, gender, level of education, marital status, number of children, and annual household income). The responses to each section of the questionnaire (e.g. buying behaviors, personality traits, and demographic characteristics) were summarized as frequency (percentage) for categorical variables, and median (interquartile range [IQR]) for scales.

Within the univariable analysis, the relationships between the likelihood of recommending the brand, the likelihood of repurchasing the brand, and each of the five personality traits were assessed using Spearman's correlation coefficient (*r*). Each personality trait was compared between those who purchased, and those who leased their vehicles using the Mann-Whitney-U test, and by number of vehicles previously owned using the Kruskall-Wallis test. To determine which factors were independently associated with vehicle buying behaviors, stepwise multivariable regression models were used. For all four behaviors, only variables significantly associated with the behavior were entered into the model with all models based on the same linear predictor:

$$u = \alpha + \beta X + \varepsilon \tag{1}$$

where X was a matrix of all demographic and personality variables selected into the models and β a vector of the corresponding regression coefficients.

For type of ownership, a binary outcome, logistic regression models was applied in the form of

$$Logit(P(Y)) = u$$

where P(Y) was a probability, or leasing a vehicle.

For likelihood of repurchase, or recommending a brand, linear regression models were used where u in the equation (1) was the likelihood of repurchase, or recommendation. Finally number of previous brand vehicles owned, or leased, was treated as ordinal (as the final category was collapsed at the time of data collection as "3+"), and so a cumulative logistic (proportional odds) model was used. The model takes the form of

$$Logit(P(Y > j)) = u$$

where Y was the number of vehicles previously owned, and j was the level of Y.

P-values of variables not included in the models were calculated by adding each factor; one at a time, to a model containing all the factors included in the model and was displayed in the tables alongside the significant results.

All tests were 2-sided and the notation ***,**, and * showed significance at the 1, 5 and 10 percent levels respectively. All analysis was conducted using IBM SPSS Statistics.

The characteristics of all respondents are displayed in Table 1. The respondents in this survey consisted of 488 working professionals. Sample subjects were 51% female, and 49% male, with 39% White, 33% Hispanic, 12% Asian, 13% African-American, and 3% were classified as Other. The highest age percentage group was 35% within the 26 – 35 years old category, 53% had only completed an associate degree, while

31% had a bachelor's degree. The biggest marital status group was 41% married, with 37% single. Regarding the number of children, 57% had no children, whereas, 32% had 1-2. The highest income level range was $35,000 - $75,000 at 35%. The majority of respondents (91%) purchased their current vehicle, while just over a third (36%) had no prior ownership, or leased a vehicle of the same brand.

Table 1: Summary of Respondent Characteristics, Personality Traits, and Buying Behavior

Variable		Variable	
All, N	488	Number of children, N(%)	
Age, N(%)		None	278(57.3)
18-25 years	157(32.2)	1-2	159(32.8)
26-35 years	171(35.1)	3 or more	48(9.9)
36-45 years	74(15.2)	Annual household income, N(%)	
46-55 years	54(11.1)	less than $35,000	113(23.3)
56 or older	31(6.4)	$35,000 - $74,999	170(35.1)
Ethnicity, N(%)		$75,000 - $124,999	128(26.4)
White	190(39.3)	$125,000 - $199,999	40(8.2)
Hispanic	158(32.6)	3 or more	
Asian	59(12.2)	Ownership type, N(%)	
African-American	61(12.6)	Lease	42(8.6)
Other	16(3.3)	Purchase	446(91.4)
Gender, N(%)		Recommendation likelihood, median (IQR)	9(7-10)
Female	248(51.2)	Repurchase likelihood, median (IQR)	9(8-10)
Male	236(48.8)	Number previously owned, N(%)	
Level of education, N(%)		None	176(36.1)
High school	25(5.2)	1	116(23.8)
Some college	261(53.8)	2	98(20.1)
4-year college degree	155(32.0)	3 or more	97(19.9)
Graduate degree	44(9.1)	Mini-IPIP domain, median (IQR)	
Marital status, N(%)		Conscientiousness	15(13-17)
Single	184(37.9)	Agreeableness	15(13-17)
Married	201(41.4)	Neuroticism	13(11-15)
Divorced/ Widowed	29(6.0)	Openness	15(12-17)
In a relationship	71(14.6)	Extraversion	13(11-16)

This table summarizes the distribution of demographic characteristics, personality traits, and vehicle buying behaviors across all survey respondents.

RESULTS AND DISCUSSION

The unadjusted relationship between buying behaviors, and the *Big Five* (Costa & McCrae, 1992) personality traits utilizing the *Mini-International Personality Item Pool (Mini-IPIP)* (Donnellan et al., 2006) are summarized in Table 2. Type of ownership was significantly associated with the extraversion domain. Those who lease their vehicle scored higher with a median (IQR) of 15(13-17) compared to those who purchased (13(12-17)) ($p = .008***$). The likelihood of recommending, or repurchasing the current automobile brand, both showed a significant correlation with the conscientiousness domain ($r = .128$, $p = .005***$; and $r = .123$; $p = .006***$), respectively. There was no association between number of vehicles previously owned, and personality.

Table 2: Univariable Association between the Personality Traits and Vehicle Buying Behaviors

Mini-IPIP Domain	Conscientiousness	P	Agreeableness	P	Neuroticism	P
Ownership type, median (IQR)						
Lease	16(14-18)	0.184	14(13-17)	0.650	11(9-13)	0.860
Purchase	15(13-17)		15(13-17)		11(9-13)	
Recommendation likelihood, r	0.128	0.005***	0.037	0.412	0.005	0.905
Repurchase likelihood, r	0.123	0.006***	0.031	0.497	-0.022	0.628
Number previously owned, median (IQR)						
None	15(13-17)	0.383	15(13-17)	0.348	11(9-13)	0.723
1	15(13-17)		14(12.25-17)		11(9-13)	
2	15(13-17)		14(12.75-16.25)		11.5(9-13)	
3 or more	16(13-18)		15(13-17)		11(8-13)	

	Openness	P	Extraversion	P		
Ownership type, median (IQR)						
Lease	15(13-17)	0.266	15(13-17)	0.008***		
Purchase	15(12-17)		13(12-17)			
Recommendation likelihood, r	-0.002	0.957	0.026	0.569		
Repurchase likelihood, r	-0.034	0.458	-0.027	0.549		
Number previously owned, median (IQR)						
None	14(12-16)	0.309	14(11-16)	0.809		
1	15(13-16)		13(11-15)			
2	15(12-17)		13(11-16)			
3 or more	11(8-13)		14(11.25-15)			

This table summarizes the relationship between personality traits, and buying behaviors. Scores in each personality trait summarize across ownership type, and number of vehicles previously owned, as median (IQR) and compares using Mann-Whitney-U tests, and Kruskall Wallis tests. The relationship between likelihood of recommending current brand, repurchasing current brand, and each of the personality traits is summarized using Spearman's correlation coefficient (r).

The relationships between ownership type and number of vehicles of the same brand previously owned are broken down by demographic characteristics in Table 3. Type of ownership varied significantly only by ethnicity ($p = 0.020$**) with the highest rate of leasing observed among Hispanic respondents (14.6%) and the lowest in Asian (3.4%), though annual household income was borderline significant ($p = 0.074$*) with those with $200,000+ in annual household income more likely to lease their vehicle. The number of vehicles previously owned differed with the age of the respondent with those in the older age group the most likely to have owned 3 or more of the same brand previously ($p < 0.001$***).

There were also differences by ethnicity ($p = 0.047$**) with 27.1% of Asian respondents previously owned 3 or more of the same brand compared to 8.2% of African Americans. Respondents with graduate degrees were also the most likely to have owned 3 or more of the same brand with re-ownership increasing with education level ($p = 0.004$***). There were also significant differences by marital status ($p = 0.005$***), number of children ($p < 0.001$***) and household income ($p < 0.001$***), with those who were married, with higher levels of education and more children likely to have owned the largest number of vehicles by the same brand.

Table 3: Univariable Association between Demographic Characteristics Broken Down by Ownership Type and Number of Vehicles Previously Owned

	Ownership Type			No Previous Vehicles of Same Brand				
	Purchase, N(%)	Lease, N(%)	p-value	None, N(%)	1, N(%)	2, N(%)	3 or more, N(%)	p-value
All	446(91.4)	42(8.6)		176(36.1)	116(23.8)	98(20.1)	97(19.9)	
Age								
18-25 years	139(88.5)	18(11.5)	0.149	64(40.8)	53(33.8)	29(18.5)	11(7.0)	<0.001***
26-35 years	156(91.2)	15(8.8)		71(41.5)	33(19.3)	35(20.5)	32(18.7)	
36-45 years	72(97.3)	2(2.7)		20(27.0)	15(20.3)	20(27.0)	19(25.7)	
46-55 years	48(88.9)	6(11.1)		15(27.8)	10(18.5)	10(18.5)	19(35.2)	
56 or older	30(96.8)	1(3.2)		6(19.4)	5(16.1)	4(12.9)	16(51.6)	
Ethnicity								
White	180(94.7)	10(5.3)	0.020**	71(37.4)	38(20.0)	36(18.9)	45(23.7)	0.047**
Hispanic	135(85.4)	23(14.6)		66(41.8)	41(25.9)	26(16.5)	25(15.8)	
Asian	57(96.6)	2(3.4)		13(22.0)	15(25.4)	15(25.4)	16(27.1)	
African-American	56(91.8)	5(8.2)		23(37.7)	16(26.2)	17(27.9)	5(8.2)	
Other	15(93.8)	1(6.2)		3(18.8)	4(25.0)	4(25.0)	5(31.2)	
Gender								
Female	230(92.7)	18(7.3)	0.333	92(37.1)	60(24.2)	47(19.0)	49(19.8)	0.922
Male	213(90.3)	23(9.7)		84(35.6)	54(22.9)	50(21.2)	48(20.3)	
Level of education								
Some high school - High school diploma	22(88.0)	3(12.0)	0.825	12(48.0)	7(28.0)	2(8.0)	4(16.0)	0.004***
Some college	240(92.0)	21(8.0)		103(39.5)	73(28.0)	42(16.1)	43(16.5)	
4-year college degree	142(91.6)	13(8.4)		49(31.6)	28(18.1)	43(27.7)	35(22.6)	
Graduate degree	40(90.9)	4(9.1)		12(27.3)	7(15.9)	10(22.7)	15(34.1)	
Marital status								
Single	169(91.8)	15(8.2)	0.864	73(39.7)	52(28.3)	35(19.0)	24(13.0)	0.005***
Married	184(91.5)	17(8.5)		65(32.3)	36(17.9)	43(21.4)	57(28.4)	
Divorced/Widowed	27(93.1)	2(6.9)		9(31.0)	6(20.7)	6(20.7)	8(27.6)	
In a relationship	63(88.7)	8(11.3)		28(39.4)	22(31.0)	13(18.3)	8(11.3)	
Number of children								
None	253(91.0)	25(9.0)	0.762	118(42.4)	75(27.0)	52(18.7)	33(11.9)	<0.001***
1-2	147(92.5)	12(7.5)		45(28.3)	30(18.9)	33(20.8)	51(32.1)	
3 or more	43(89.6)	5(10.4)		12(25.0)	11(22.9)	12(25.0)	13(27.1)	
Annual household income								
less than $35,000	102(90.3)	11(9.7)	0.074*	41(36.3)	36(31.9)	25(22.1)	11(9.7)	<0.001***
$35,000 - $74,999	157(92.4)	13(7.6)		68(40.0)	43(25.3)	31(18.2)	28(16.5)	
$75,000 - $124,999	116(90.6)	12(9.4)		50(39.1)	26(20.3)	24(18.8)	28(21.9)	
$125,000 - $199,999	40(100)	0(0)		9(22.5)	6(15.0)	10(25.0)	15(37.5)	
$200,000+	28(82.4)	6(17.6)		8(23.5)	4(11.8)	7(20.6)	15(44.1)	

This table displays the demographic characteristics of respondents broken down by ownership type and number of vehicles previously owned. Comparisons were made using the Chi-squared test or Fisher's exact test, as appropriate.

The distribution of scores representing the likelihood of recommending or repurchasing the brands broken down by demographic characteristics is displayed in Table 4. The only characteristic by which likelihood of recommending the brand significantly varied was age ($p = 0.006***$) where the oldest respondents, i.e. those 56 years or older, reported a median likelihood of 10 (9-10) while in all other age groups the median (IQR) was 9 (8-10). The likelihood of repurchasing the vehicle also varied significantly only with age ($p = 0.003***$) with the likelihood increasing with age. In 18-25 year olds the median (IQR) was 8 (7-9), rising to 10 (8-10) in those ages 56 or older. Annual household income was significant at the 10% p-levels for both outcomes ($p = 0.078*$ and $p = 0.080*$) with a trend towards those who had higher incomes being more likely to recommend or repurchase the same brand again.

Table 4: Univariable Association between Likelihood of Recommending and Repurchasing the Current Brand and Demographic Characteristics

	Likelihood of Recommendation			Likelihood of Repurchasing		
	Median	IQR	P-Value	Median	IQR	P-Value
All	9	7-10		9	8-10	
Age						
18-25 years	9	8-10	0.006***	8	7-9	0.003***
26-35 years	9	8-10		9	7-10	
36-45 years	9	8-10		8	7-10	
46-55 years	9	8-10		9	7-10	
56 or older	10	9-10		10	8-10	
Ethnicity						
White	9	8-10	0.122	9	7-10	0.456
Hispanic	9	8-10		9	7-10	
Asian	9	8-10		8	8-10	
African-American	9	7-10		8	6-10	
Other	7.5	5-10		7.5	4.25-10	
Gender						
Female	9	8-10	0.636	9	7-10	0.982
Male	9	8-10		9	7-10	
Level of education						
Some high school -High school diploma	9	7-10	0.845	8	6-9.5	0.828
Some college	9	8-10		9	7-10	
4-year college degree	9	8-10		9	7-10	
Graduate degree	9	8-10		8	7-9	
Marital status						
Single	9	8-10	0.562	9	7-10	0.506
Married	9	8-10		9	7-10	
Divorced /Widowed	9	7-10		8	7-10	
In a relationship	9	8-10		9	6.75-10	
Number of children						
None	9	8-10	0.257	8	7-10	0.086
1-2	9	8-10		9	7-10	
3 or more	9	8-10		9	8-10	
Annual household income						
less than $35,000	9	8-10	0.078*	8	7-9	0.080*
$35,000 - $74,999	9	8-10		9	7-10	
$75,000 - $124,999	9	8-10		9	7-10	
$125,000 - $199,999	9	7-10		9	7.25-10	
$200,000+	10	9-10		9	8-10	

This table provides the median (IQR) scores on the scales used to rate the likelihood of repurchasing and of recommending the current brand by demographic characteristics. Comparisons between groups were made using the Mann-Whitney-U test of Kruskall Wallis test, as appropriate.

To determine which personality traits influence buying behaviors, after adjusting for, and demographic characteristics were considered, multivariable stepwise regression models were used, the results of which are presented in Table 5. Among demographic characteristics, ethnicity was the only factor that was significantly associated with all four buying behavior indicators. Asian respondents were the least likely to lease their vehicles, and Hispanic respondents were over 3 times more likely to lease than White respondents (OR = 3.166 (1.450 - 6.914)). Respondents of Other ethnicity were the least likely to indicate that they would recommend, or repurchase their current vehicle, but were the most likely to have previously owned vehicles of the same brand. Speculating, based on the overall demographics of the respondents, we believe Other to represent the Middle Eastern community. Age was also a significant predictor of likelihood of repurchasing, and having previously owned the same brand, with those in the oldest age category most likely to indicate they would repurchase, and most likely to previously own more vehicles within the same brand. Number of children were a significant predictor of the number of vehicles previously owned by participants who had no children the least likely to report previous ownership.

Level of education and annual household income were both significant predictors ($p = < 0.10$) of the number of vehicles previously owned by those with higher incomes, and higher levels of education tending to be more likely to have previously owned a greater number of the same vehicle.After adjusting for significant demographic variables, extraversion was associated with ownership type ($p = .021**$). For every one-point

increase in the extraversion score, the odds of leasing a vehicle, rather than purchase, increased by 12.6% (OR=1.126 (95% CI 1.018-1.245)). Level of conscientiousness was associated with how likely a respondent was to recommend their current brand (p = .027**). For every one-point increase in the conscientiousness score, the mean score on the recommendation scale increased by 0.059 (0.007 - 0.111). Agreeableness and openness to new experiences were both significantly associated with the odds of having previously owned vehicles of the same brand (p = .008*** and p = .001***), respectively. For a one-point increase in the agreeableness domain, the odds of having previously owned one additional vehicle increased by 8.1% (OR = 0.919 (0.863 - 0.978)). Conversely a one-point increase in the openness to new experiences domain was associated with a 10.6% increase in odds (OR = 1.106(1.042 - 1.173)). None of the personality traits were associated with the likelihood of repurchasing the same vehicle. The R^2 values associated with the models were 0.138, 0.101, 0.091 and 0.137 for ownership type, likelihood of recommendation, likelihood of repurchase and number previously owned, respectively. Therefore, although the above factors are significantly associated with buying behavior they only explain up to 14% of the variation in buying behavior suggesting that other unmeasured factors also play a part.

Table 5: Multivariable Associations between Vehicle Buying Behaviors, Personality Dimensions, and Demographic Characteristics

	Ownership Type		Likelihood of Recommendation	
	or (95% ci)	p	beta (95% ci)	p
mini-ipip domain				
conscientiousness		0.339	0.059 (0.007-0.111)	0.027**
agreeableness		0.407		0.839
neuroticism		0.510		0.679
openness		0.843		0.367
extraversion	1.126(1.018-1.245)	0.021**		0.841
age		0.156		0.117
18-25 years				
26-35 years				
36-45 years				
46-55 years				
56 or older				
ethnicity				
white	1	0.021**	ref	0.005***
hispanic	3.166(1.450-6.914)		0.236(-0.139-0.612)	
asian	0.756(0.159-3.597)		0.140(-0.378-0.657)	
african-american	1.648(0.536-5.063)		-0.175(-0.0687-0.337)	
other	1.334(0.158-11.292)		-1.485(-2.391- -0.580)	
gender		0.560		0.531
level of education		0.739		0.441
high school				
some college				
4-year college degree				
graduate degree				
marital status		0.854		0.901
number of children		0.720		0.364
none				
1-2				
3 or more				
annual household income		0.133		0.217
less than $35,000				
$35,000 - $74,999			\	
$75,000 - $124,999				
$125,000 - $199,999				
3 or more				
r^2	0.138		0.101	

This table displays the demographic characteristics and personality traits that were independently associated with buying behavior. Logistic regression was used to model the odds of leasing the current vehicle and results summarized as odds ratios (OR). Linear regression was used to explore associations with the likelihood of recommending or repurchasing current brand of vehicle. Cumulative logistic regression models were used for a number of vehicles previously owned. The ORs indicates the odds of having previously owned an additional vehicle.

Table 5 (Cont'd): Multivariable Associations between Vehicle Buying Behaviors, Personality Dimensions, and Demographic Characteristics

	Likelihood of Repurchase		Number Previously Owned	
	Beta (95% CI)	P	OR (95% CI)	P
Mini-IPIP domain				
Conscientiousness		0.148		0.579
Agreeableness		0.973	0.919(0.863-0.978)	0.008***
Neuroticism		0.764		0.882
Openness		0.433	1.106(1.042-1.173)	0.001***
Extraversion		0.262		0.648
Age				
18-25 years	Ref	0.003***	1	0.007***
26-35 years	0.501(0.012-0989)		1.251(0.825-1.897)	
36-45 years	0.162(-0.463-0.788)		2.023(1.153-3.548)	
46-55 years	0.414(-0.303-1.131)		2.167(1.108-4.237)	
56 or older	1.649(0.770-2.529)		4.148(1.835-9.375)	
Ethnicity				
White	Ref	0.029**	1	0.007***
Hispanic	0.529(0.040-1.019)		0.879(0.586-1.318)	
Asian	0.308(-0.352-0.968)		2.118(1.226-3.660)	
African-American	-0.175(-0.833-0.484)		0.829(0.482-1.4290	
Other	-0.984(-2.135-0.168)		2.335(0.901-6.051)	
Gender		0.947		0.280
Level of education		0.460		
High school			1	0.069*
Some college			1.147(0.024-3.152)	
4-year college degree			2.183(0.999-3.177)	
Graduate degree			1.510(0.595-3.850)	
Marital status		0.587		0.944
Number of children		0.581		
None			1	0.018**
1-2			1.941(1.281-2.942)	
3 or more			1.491(0.784-2.835)	
Annual household income		0.711		
less than $35,000			1	0.081*
$35,000 - $74,999			0.857(0.535-1.340)	
$75,000 - $124,999			0.714(0.424-1.204)	
$125,000 - $199,999			1.758(0.858-3.644)	
3 or more			1.619(0.745-3.515)	
R^2	0.091		0.137	

This table displays the demographic characteristics and personality traits that were independently associated with buying behavior. Logistic regression was used to model the odds of leasing the current vehicle and results summarized as odds ratios (OR). Linear regression was used to explore associations with the likelihood of recommending or repurchasing current brand of vehicle. Cumulative logistic regression models were used for a number of vehicles previously owned. The ORs indicates the odds of having previously owned an additional vehicle.

CONCLUDING COMMENTS

Upon reviewing the analysis of this study, it is determined that demographic features, and personality dimensions do play a significant role in whether a buyer will recommend, repurchase, have prior brand ownership of a particular brand, and will either purchase or lease a vehicle within the automobile industry landscape. This information is important to car dealership owners, managers, sales teams, and staff in a variety of ways. Dealers typically have demographic data of their customers on hand. This information is found internally through the customers' application process, and service appointments. Dealers could seek using a personality survey to gain more of an insight into their customers' personality dimensions, and then tailor dealership marketing efforts to reach out to those particular customers that are more inclined to recommend, repurchase, be on-going repeat buyers, and purchase or lease through these identified personality dimensions. Utilizing the customers' demographic information from having customers complete a brief demographic questionnaire could likewise do this.

With the dealers conducting both a spontaneous personality analysis on their customers, as well as, having access to customer demographic characteristics, whether documented or observed, this could allow the dealership to modify their sales and marketing approaches to gain repeat customers, specific repeat car brand buyers, as well as, those particular customers who are more likely to recommend a brand could be besought for family and friend contacts to further market to, as well. The goal of this paper was to identify which personality and demographic characteristics were more likely than not to indicate a car buyer's likelihood to recommend a brand, repurchase a brand, purchase a car versus lease a car, and the likelihood for the car buyer to be a repeat customer of the same brand. Identifying these personalities and demographic significant areas could help car dealership tailor their marketing efforts towards these certain groups of customers either by way of developing a questionnaire to give new car buyers and current clients within the service department that would identify these customers that did in fact contain significant personality and demographic traits. The data were collected over a period of two years (2012-2014) from working professionals in the Houston, Texas area with total participation of 488 participants. The methodology that was used to identify the personality and demographic statistical traits and characteristics were univariable analysis, stepwise multiple regression analysis, Spearman's correlations, logistic and linear regression models, cumulative logistic (proportional odds) model, Mann-Whitney-U test, and the Kruskall-Wallis test.

A summary of the primary findings includes that the participants who scored higher in extraversion are more likely to lease a car versus outright purchase a car. Customers who are more conscientiousness are more likely to recommend or repurchase their current automobile brand. Hispanics are more likely to lease their cars, and Asians are the least likely to lease a vehicle. Those in the older age group (e.g. 56+) are more likely to have owned 3 or more of the same brand, and more likely to recommend and repurchase their current car brand. Asians are more likely to own 3 or more of the same brand, with African-Americans owning the least amount of the same brand overall. Respondents with higher incomes, and higher levels of education (e.g. graduate degrees) tend to be more likely to have previously owned a greater number of the same vehicle. Those who are married, with higher levels of education and more children are more likely to have owned the largest number of vehicles within the same brand. Additionally, those with higher incomes are more likely to recommend or repurchase the same brand.

Hispanic respondents are more likely to lease a car, 3 times more than Whites, while Asians are the least likely to lease. The Other ethnicity group (speculative to be Middle Eastern responders) are more likely to have previously owned vehicles of the same brand, however, they are the least likely to recommend or repurchase their current vehicle. Participants with no children are least likely to have prior brand ownership. The more extroverted the participants, the more likely to lease over purchase a car. The more conscientious the participants are, the more likely to recommend their current car brand. The more agreeable and more open to new experiences the participant is, the more likely to have previously owned vehicles from the same brand. A limitation to this study includes the fact that specific brands were not identified more clearly that the participants were most likely to recommend and repurchase. Although specific brand questions (e.g. Ford, Honda, Chevrolet, Cadillac) were asked in the survey, this information was not used to further give diagnosis to this study. A direction for a future study would be to examine which brands within the automobile industry are the most recommended and repurchased.

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