

Masculinity/Femininity and Automotive Behaviors: Emerging Knowledge for Entrepreneurs

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Abstract

Entrepreneurs interested in tapping auto related business opportunities are provided information about how automotive behaviors and the gender roles of masculinity and femininity (expected sex-related behaviors) interrelate. Automotive maintenance activities and use of technical features were surveyed. A MANOVA was conducted with the results indicating that the inspection of air filters and the use of turn signals, seat belts, and overdrive are related to masculinity/femininity, while other maintenance behaviors and automotive feature usage may not be. Frequencies for performing automotive behaviors were reported for men and women, revealing significant differences. This knowledge may be relevant for auto-related entrepreneurs.

Introduction

As entrepreneurs organize and manage businesses, they must be aware of societal norms and changes in them to assure grasping emerging business opportunities. Such insights may allow better tailoring of offerings to buyers' needs. An important life domain that is changing is that of gender roles and expected sex-related behaviors regarding masculinity and femininity. These behavioral patterns have been studied extensively as they relate to many variables; however, their relationship to the automobile, a critical cornerstone in our economy, has not.

A portion of gender role research has related somewhat to the work or business realms. Examples include that of Rochlen, Mohr, and Hargrove (1999) in which men expressed more negativity about career counseling providers than women, and the efforts of McElwain, Korabik and Rosin (2005) that illustrated the relationships of gender roles to work satisfaction and work interferences. More directly related studies have found that gender has a major impact on some business issues, such as consumer behavior. These are represented by studies like Dholakia's and Chiang's (2003) which noted that gender is closely associated with stereotyping shoppers, that is, both men and women usually view the typical consumer as a woman. Yet, when the product is technical and expensive (e.g., audio equipment) this stereotype reverses. Female consumers are usually regarded as having fewer technical inclinations, being less impulsive, and more reliable than males. While men's shopping behaviors are not well researched, the few studies that examined their preferences have focused on traditional "male items," such as electronics or automobiles (Otnes & McGrath, 2001; Zinn, 1992). Men with a "macho" personality are more likely to purchase vehicles that emphasize speed, power, and sportiness than "non-macho" males (Krahe & Fenske, 2002).

Gender also appears to be related to the use of technical equipment. Meier and Lambert (1991) found that women show higher levels of discomfort with computers than men. Other studies have shown that gender is often associated with judgment about knowledge or abilities in technical areas. Noteworthy is that stereotypes about women and driving have existed almost since the first automobile (Berger, 1986). Berger explains that many of these perceptions relate to femininity and cleanliness. For example, during the early part of the 20th Century, cars and traveling conditions were trying and women risked arriving at their destinations disheveled. Although this mode of transportation (closed vehicles vs. open) and the condition of roads have changed during the last century, it appears that the stereotype of "women drivers," their lack of interest in the technical aspects of vehicles, and ignorance of maintenance may still exist for many. However, it is clear that more and more women, especially as single heads of households, have sole responsibility for traditional male decisions regarding vehicle choice, purchase, and maintenance (Gender Statistics of Europe and North America, 2004). Not everyone in automotive related industries seems to be aware of these gender role changes.

Automobiles have an enduring place in our society and fulfill various purposes in terms of practicality and leisure. To many, they are regarded as essential possessions. Previous studies have revealed that personality has an impact on choices of hobbies and creativity as well as how much time and money individuals are willing to invest in these activities (Dodgen & Rapp, 1992; Wolfradt & Pretz, 2001). One of the hobbies or outlets for creativity that many

choose is the automobile (Marsh & Collett, 1987). Society has accepted motor vehicles as more than transportation. Many view their vehicles as a means of self-expression and as extensions of themselves (Marsh & Collett, 1987). Marsh and Collett found that passion and sexuality are closely associated with certain cars and are taken seriously by their owners. Because increasing numbers of women are dealing with automobiles in ways they typically have not—and because this may provide entrepreneurial opportunities—research should focus on comparing gender differences with regard to automotive behaviors. The purpose of this study was to determine if masculinity and femininity are related to vehicle maintenance and to the use of selected automotive technologies.

Materials and Methods

Participants

A total of 314 participants completed the study. Of these, 279 were graduate students at a medium-sized university in the Southern United States. The remaining 35 participants were recruited from a broader area of the South and the Northeast. Since the latter did not differ from the former on the variables of interest, the data were pooled. Females accounted for 68.7% of respondents. Age ranged from 17 to 70 years. The mean age was 30.1 years ($SD = 11.5$). The ethnic distribution was as follows: Caucasians 64.3%, African Americans 31.2%, Hispanic/Latino 1%, Native Americans 1%, Asian Americans 0.6%, and “other” 1.9%. In terms of marital status, 50% of the sample were never married, 35% were married, 9.6% were divorced, 3.5% were remarried, 1.3% were separated, and 0.6% were widowed. The educational level of the sample was as follows: Bachelor degrees 46.5%, Masters degrees 8.9%, Associates degrees 4.1%, and Doctoral degrees 1.6%. The remainder of the sample (35.0%) had either high school diplomas or GED’s. A total of 3.2% reported having no high school diploma or equivalent, and 0.6% failed to mark a response.

Automotive Questionnaire

The Automotive Questionnaire¹ (AQ) consists of 33 questions developed by two professors, one of whom is also a published automotive expert, and a first-year doctoral student. The question format was either open-ended (e.g., “What make vehicle is your primary transportation?”) or forced-choice (e.g., “Did you read the owner’s manual or watch the video tape? Yes or No.”). The AQ included questions regarding technical knowledge about the vehicle, automotive maintenance behaviors, use of technical features, and behaviors while driving.

Personal Attributes Questionnaire

The Personal Attributes Questionnaire (PAQ; Spence & Helmreich, 1978) measures masculine and feminine traits. For example, respondents decide which dimension of aggression or independence they prefer on a 5-letter scale (e.g., A = *Not at all aggressive* to E = *Very aggressive*). The PAQ consists of two subscales of interest to this study: masculinity [Cronbach’s coefficient alpha (α) = .75] and femininity (α = .79) (Cronbach, 1951; Spence, Helmreich & Stapp, 1974). From these measures the following scores can be obtained: masculinity (high on masculine traits), femininity (high on feminine traits), androgyny (high on both masculine and feminine traits), and undifferentiated (low on both masculine and feminine traits).

Procedure

The survey, including a demographic questionnaire, was distributed to students and associates of the researchers. Extra credit was given in some academic classes, depending on the instructor. Because the survey was time-consuming and research participation could not infringe on class time, students were asked to complete the instruments outside of class and return them to their respective professors. After return of the anonymous surveys, scores on the masculinity/femininity scales were calculated for each participant and these responses were related to those on the automotive questionnaire. In part, because androgyny (high on both masculine and feminine scales) entails high masculine scores, those scoring androgenous were included in the masculine group for purposes of analyses, and those designated undifferentiated (low on both scales) were included with the feminine group.

Results

A multivariate analysis of variance (MANOVA) was computed with gender scores as the independent variable and automotive maintenance (checking oil, other fluids, tire pressure, tire tread, inspecting hoses and air filter) and automotive feature use (remote alarm, turn signals, cruise control, driving lights, seat belts, and overdrive) as the dependent variables. Results indicate that gender traits are significantly associated with automotive maintenance and the use of technological features of vehicles (Wilks’ Lambda = .825, $F(36, 804.382) = 1.506$, $p = .03$).

Masculinity/femininity was related to how often automobile users inspect air filters, $F(3, 283) = 2.84$, $MSE = 2.55$, $p = .038$, and the use of turn signals, $F(3, 283) = 2.82$, $MSE = 2.54$, $p = .040$, seat belts, $F(3, 283) = 3.95$, $MSE = 4.96$, $p = .009$, and overdrive, $F(3, 283) = 4.82$, $MSE = 27.37$, $p = .003$. Due to low participant numbers for some categories, post hoc tests were unable to identify which of the specific masculinity/femininity characteristics were related to automotive behaviors. The other dependent variables were not related to masculinity/femininity.

Table 1 displays the frequencies of automotive behaviors for males and females. These results show that there were some differences in many of the aspects of checking and inspecting automotive mechanical features, while other areas seemed unrelated to gender. While a small number of males reported checking oil (2%) and other fluids (1.0%) daily, none of the females reported doing so. Some males (6.1%) also reported inspecting their tire tread daily while a much smaller number of females (0.9%) did likewise. More males appeared to check tire pressure (19.4%) and tire tread (21.4%) on a weekly basis than females (8.8 and 6.5%, respectively). Some similarities were found in the monthly checking of oil (women = 38.6%, men = 40.8%), other fluids (women = 37.7%, men = 37.8%), and inspection of hoses (women = 9.8%, men = 9.2%). Overall, the “never check or inspect” category across all measures was more often marked by females than males.

Table 1
Frequency of Checking/Inspecting Automotive Features for Men and Women (in percentage)

Check/Inspect	Men						Women					
	Daily	Weekly	Monthly	Quarterly	Annually	Never	Daily	Weekly	Monthly	Quarterly	Annually	Never
Oil	2.0	10.2	40.8	43.9	1.0	1.0	0.0	7.0	38.6	48.4	1.4	2.8
Other Fluids	1.0	7.1	37.8	46.9	3.1	2.0	0.0	2.8	37.7	48.8	5.1	4.7
Tire Pressure	2.0	19.4	32.7	34.7	5.1	4.1	0.9	8.8	36.7	40.9	4.2	7.4
Tire Tread	6.1	21.4	24.5	36.7	7.1	2.0	0.9	6.5	27.4	43.7	9.8	10.7
Hoses	1.0	4.1	9.2	51.0	23.5	11.2	0.5		9.8	39.1	24.7	23.3
Air Filter	6.1	21.4	51.0	15.3	6.1	0.5	15.3		15.3	50.7	15.3	15.8

N= 314

Table 2 shows the frequency of using automotive features. These results demonstrate that men and women differed in some areas of technology use while they were similar in others. Differences were noted in the “always” category for using turn signals (women = 63.7%, men = 50%), driving lights (women = 52.6%, men = 42.9%), seat belts (women = 78.6%, men = 63.3%), and overdrive (women = 14.4%, men = 33.7%). “Never” was indicated for using turn signals (women = 0%, men = 5.1%) and overdrive (women = 51.6%, men = 19.4%). In the “always” category, men and women reported similar use for remote alarms (women = 22.8%, men = 22.4%) and cruise control (women = 5.6%, men = 5.1%). “Very often” was reported by males and females for using of turn signals (women = 23.7%, men = 25.5%), cruise control (women = 21.4%, men = 18.4%), driving lights (women 22.8%, men = 19.4%), and seat belts (women 11.2%, men = 12.2%). “Rarely” was reported for using overdrive (women = 7.9%, men = 7.1%). Finally, “never” was indicated for using remote alarm (women = 49.3%, men = 49%), driving lights (women = 2.8%, men = 3.1%), and seat belts (women = .9%, men = 2%).

Table 2
Frequency of Utilizing Automotive Features for Men and Women (in percentage)

Utilizing	Men							Women						
	Always	V.Often	Freq.	Sometimes	N.Often	Rarely	Never	Always	V.Often	Freq.	Sometimes	N.Often	Rarely	Never
Remote Alarm	22.4	9.2	9.2	5.1	5.1		49.0	22.8	5.1	4.2	4.2	5.6	6.0	49.3
Turn Signals	50.0	25.5	13.3	6.1	5.1		5.1	63.7	23.7	9.3	3.3			
Cruise Control	5.1	18.4	25.5	24.5	5.1	2.0	19.1	5.6	21.4	20.0	21.9	6.5	6.5	17.7
Driving Lights	42.9	19.4	19.4	13.3	1.0	1.0	3.1	52.6	22.8	13.5	4.7	0.5	2.8	2.8
Seat Belts	63.3	12.2	12.2	6.1	2.0	2.0	2.0	78.6	11.2	4.7	2.8	0.5	1.4	0.9
Overdrive	33.7	12.2	7.1	14.3	6.1	7.1	19.4	14.4	4.2	2.3	9.3	8.8	7.9	51.6

N = 31

Discussion

This study demonstrates that for the present sample, traits of masculinity/femininity are significantly associated with some automotive behaviors and not with others. Of six different maintenance variables, only one (inspecting air filters) showed a significant difference. The other maintenance behaviors: checking oil, other fluids, tire pressure, tire tread, and hoses were not related to masculinity/femininity. This is curious and future investigations may explore the underlying reasons for such findings. For example, perhaps inspecting air filters demands more mechanical knowledge than other maintenance activities. More specifically, inspection of the air filter can involve the use of tools (e.g., screw driver) while most of the other maintenance tasks can be performed without handling special devices. It could also be that dirty air filters are usually not associated with safety whereas checking tire pressure and tread often are. Air filters also are not often associated with increased risk of breaking down like overused oil, lack of fluids, and defective hoses. This may decrease the perceived importance of air filter inspection for women. Although unable to determine which groups differ, the MANOVA shows that there is a difference among the subgroups in regard to automotive behaviors.

The frequency analysis of automotive behavior revealed gender differences and similarities. Men were more concerned than women with daily and weekly inspections of their automobiles. Traditional male upbringing often involves mechanical training, such as helping fathers and other male relatives with vehicle maintenance and men may come to believe that such tasks are their responsibility. Males and females are more similar in their monthly, quarterly, and annual inspection patterns. Overall, women selected the “never” category significantly more often than men, indicating that they are more likely than men to ignore certain facets of their vehicles, such as tire tread and hoses. This might be due to uncertainties about the functions or importance of some automotive parts or the belief that maintenance constitutes “dirty” work which has been traditionally considered to be for males.

Examination of the use of technology shows that three out of the six variables are related to masculinity/femininity. Use of turn signals, seat belts, and overdrive were found to be different for masculinity/femininity. The use of a remote alarm, cruise control, and driving lights were unrelated to masculinity/femininity. The study shows that women are more likely to use their turn signals and seat belts than men. Interestingly, turn signals and seat belts are safety oriented automotive features while using overdrive appears to be a technical aspect of driving if not engaged automatically. Due to the numbers in some groups being low, it was impossible to determine which gender traits affected automotive behaviors, a shortcoming addressable by further research.

Regarding frequencies, men and women reported similar patterns in some areas and differences in others. Women reported using turn signals, seat belts, and driving lights more frequently than men. These features are clearly safety oriented which suggests that women might be more concerned about the safety of themselves and their passengers than their male counterparts. Perhaps this is because women have traditionally been caretakers and often feel responsible for their and their families’ safety, whereas men may be less safety-oriented or have expectations they can avoid accidents. Empirical evidence supports this. When men are compared to women, they express a higher sense of driving competency and perceive less risk in various dangerous driving behaviors (DeJoy, 1992). It might be that because men perceive their driving ability as high and driving risk as low, they see less need for use of automotive features associated with safety.

Conversely, overdrive is reported to be more frequently used by men in standard shift vehicles. This feature constitutes a more technical aspect of driving and is less associated with safety and more related to appropriate vehicle use. Some women might not be aware of the function of this feature and that its use can help conserve fuel. Or, they may not know exactly to what the term refers (i.e., a specific top-gear ratio) and use it without understanding that they are doing so. Traditionally, men have been more exposed to automotive technology and have been educated about such functions. Women’s liberation and emancipation have contributed to increased female interest in activities previously considered largely within the male domain. More women now have their own vehicles and are solely responsible for their functioning. Increased self-efficacy in women may be a reason why so few differences were found in gender behavior regarding the automobile in the present study. While there are still dissimilarities in male and female automotive behaviors, there appears to be an increased interest for women being less dependent on men for automotive work. Though some advertisements appear to specifically target women as potential buyers, there is clearly room to make greater use of an apparently narrowing automotive gender gap.

Entrepreneurs may be able to use emerging gender role research results like these to better orient their goods and services to those who are most apt to need and purchase them, or better inform potential customers of the benefits of changing auto technology—leading to increased purchases and usage. Increasingly, this will entail broader marketing to females while targeting specific technical features. For example, an automotive salesperson could ensure that female customers understand and practice using manual overdrive (helping them understand what it is and does) or move them to an automatic transmission (possibly increasing the sales margin) and explain the

benefits in doing so. Future research can more clearly pinpoint which gender characteristics interact with more specific automotive behaviors and can help to fine-tune entrepreneur opportunities.

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Footnote

¹The Automotive Questionnaire is available from the second author.