**Thesis**

### MASTER THESIS MARKETING MANAGEMENT/MARKETING ANALYTICS FALL 2022

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1. *Chapter – Introduction*
2. *Chapter – Theoretical framework*
3. *Chapter – Methodology*
4. *Chapter – Analysis and Results*
   1. *The data*
      1. *Randomization*

The final sample was about 260 participants. All participant were randomly assigned to one of the experimental groups. To assess the randomization, in the study, a one-way ANOVA was performed with gender as the dependent variable. The result produced by this one-way ANOVA confirm that the process of randomization was well applied because there is no significant difference between the groups (genders) (F(1) = 0.367, p = 0.5453). To confirm this test, the same procedure was done but using age as a dependent variable (F(1) = 0.11, p = 0.740). Again these result confirm the initial statement that randomization was correctly apply in the experiment.

* + 1. *Cronbach’s Alpha – internal scale consistency*

Before running the main analysis, it is important to validate the internal consistency of some items within the questionnaire. Given that the unique variable that was measured through a scale was psychological ownership, this assessment was just applied to this variable but more precisely to the items related to it. As was explained by Cronbach (1951) when the alpha generated is higher than 0.70 it is possible to determine that the scale has a good consistency. The alpha obtained for the four items related to the measurement of psychological ownership was close to 0.96, this indicates that, in fact, the scale has a very good level of reliability; therefore, the main analysis could be performed.

* 1. *Assumptions*

Given that this study uses analysis of variance in order to get the main outputs, some tests must be done to validate the basic assumptions behind ANOVA statistical model. First, the observations have to be independent, given that this is a between-subject design experiment it is possible to assume that this first condition was fulfilled.

The second of these assumptions is related to the concept of homoscedasticity or homogeneity of variances. In order to make this assessment, a Levene’s test should be carried out. It is important to recall that the null hypothesis in Levene’s test, states that all groups have equal variances. The test was done for both, willingness to pay (F(1, 258) = 0.675, p = 0.412) and psychological ownership (F( 1,258) = 6.174, p = 0.014). For the independent variable, there is no significant output; therefore, the null hypothesis is maintained and there is no difference between the variances. For the mediator there is a significant result, this means that it was observed different variances across the treatment groups. Usually, regarding Levene’s test, it is expected to avoid a significant p-value (lower than 0.05), but, according to Hair et al (2014) the violation of this assumption does not have a big impact if the groups have approximately the same size, that is the case in this study.

The third assumption is based on the concept of normality. In order to validate it, a Shapiro-Wilk test was carried out. This test suggests that normality was not found for either willingness to pay (W(260) = 0.95, p < 0.001) and psychological ownership (W(260) = 0.92, p <0.001). Although normality is always wanted, it is possible to be less concerned about it based on the contributions provided by Hogg et al (2012) who said that when the sample size is large enough (>200) the Central Limit Theorem guarantees a roughly normal distribution. Despite some results were not the expected ones, the general conditions were fulfilled therefore it was possible to carry out the main analyses.

* 1. *Descriptive statistics*

The descriptive statistics shown in table 2, summarize the data for each of the 4 experimental conditions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Condition | Willingness to pay | | Psychological ownership | |
| M | SD | M | SD |
| Hedonic-High (N = 65) | 1944 | (1188) | 4.74 | (1.61) |
| Hedonic-Low (N = 66) | 1531 | (1132) | 5.25 | (0.99) |
| Utilitarian-High (N = 65) | 2067 | (1324) | 4.93 | (1.49) |
| Utilitarian-Low (N = 64) | 2242 | (1361) | 4.95 | (1.61) |

Table 2: Mean and standard deviation of dependent variables and mediator.

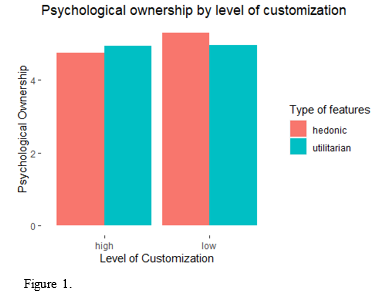
Notes: Psychological ownership was measured using a scale from 1 to 7. The range to measure willingness to pay was from 0 to 5000 USD.

* 1. *Correlations*

Although there is an important scatter along the data collected (the correlation coefficients tend to be small) there are some interesting correlations that were identified along the data set. For instance the relationship between willingness to pay and psychological ownership (r(258) = 0.26, p < 0.001) or the one obtained between the type of features used to customize and WTP (r(258) = -0.16, p <0.01) confirm the theory previously detailed in chapter two. Additionally, there are other interesting and significant correlations detected like those two related to one of the covariates, knowledge, had by participants, about cars. This covariate had relevant links with both, willingness to pay (r(258) = 0.13, p = 0.03) and psychological ownership (r(258) = 0.20, p < 0.01).

* 1. *Main analysis*

In order to carry out the main analysis, model 8 of the PROCESS macro developed by Hayes (2022) was used and run in R. This procedure gives the main outputs in order to determine the direct and indirect effect of the moderated mediation but also, with it, is possible to assess the influence of each variable (including the covariates) and also if there is an interaction between the two treatment variables and both, the mediator and the dependent variable. Additionally, some individual t-tests were performed to see the individual influence of each of the two treatment variables with both, willingness to pay and psychological ownership.

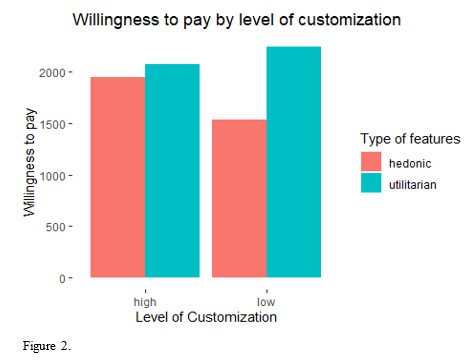
* + 1. *Psychological ownership – Mediator*

For psychological ownership, when the one-sided t-test was performed, there are no significant results regarding the second hypothesis (T(258) = -1.60, p = 0.94) therefore the hypothesis cannot be accepted because higher psychological ownership, for customers within the high-level condition, was not found, in fact, precisely the opposite was identified. Additionally, when the regression is performed in order to assess the interaction between the independent variable and the moderator, the level of significance is not relevant either (F(1) =2.55, p = 0.12). Hence the H4 cannot be accepted. If we take a deeper glance at the collected data regarding the mediator and each of the four experimental conditions, is possible to see a high degree of scattering, making it difficult to identify a pattern between the four groups and the mediator variable (M Hedonic-High = 4.74, SD = 1.61; M Hedonic-Low = 5.29, SD = 0.998; M Utilitarian-High = 4.93, SD = 1.49; M Utilitarian-Low = 4.95, SD = 1.61).

|  |  |  |  |
| --- | --- | --- | --- |
| Psychological Ownership | | | |
| Level of customization | Hedonic | Utilitarian | Mean |
| High-level | 4.74 (σ = 1.61) | 4.93 (σ = 1.49) | 4.83 (σ = 1.55) |
| Low-level | 5.29 (σ = 0.99) | 4.95 (σ = 1.61) | 5.12 (σ = 1.34) |

Table 3: Mean and standard deviation of psychological ownership by the level of customization and type of features used to customize.

* + 1. *Willingness to pay – Dependent variable*

For the dependent variable, the effect of the independent variable is not significant (T(258) = 0.79, p = 0.21) although the mean for the high-level condition is higher than the low condition (M High = 2006, SD = 1254) (M Low =1881, SD = 1295); therefore, H1 has to be rejected. The effect of the interaction (IV\*MOD) is (F(1)= 2.68, p = 0.10). Although it was so close to being significant, based on the confidence interval stated for this research, we have to reject H3. If we analyze the result by the means of each group, it is possible to see how, in general, the average willingness to pay is higher for the two groups with the utilitarian condition assigned (M Utilitarian-High = 2067, SD = 1324; M Utilitarian-Low = 2242, SD = 1361; M Hedonic-High = 1944, SD = 1188; M Hedonic-Low = 1531; SD = 1132). Table 4 summarizes all the findings regarding the dependent variable.

|  |  |  |  |
| --- | --- | --- | --- |
| Willingness to Pay | | | |
| Level of customization | Hedonic | Utilitarian | Mean |
| High-level | 1944(σ = 1188) | 2067 (σ = 1324) | 2006 (σ = 1254) |
| Low-level | 1531 (σ = 1132) | 2242 (σ = 1361) | 1881 (σ = 1295) |

Table 3: Mean and standard deviation of willingness to pay by the level of customization and type of features used to customize.

Although, when the one-sided t-tests were performed, the results were not the expected ones, it is possible to highlight that in fact there are some significant differences when some two-sided t-tests were executed. Table 4 contains that information. In it, is possible to see how, in fact, there is a significant difference in willingness to pay between the two conditions of the moderator.

|  |  |  |
| --- | --- | --- |
| Two-sided t-tests | | |
| Variables | Level of customization | Type of features |
| Psychological ownership | T(258) = -1.60; p = 0.11 | T(258) = 0.44; p = 0.66 |
| Willingness to pay | T(258) = 0.79; p = 0.43 | T(258) = -2.68; p = 0.01 |

Table 4: Coefficients and p-values of individual two-sided t-test.

* + 1. *Hayes Bootstrapping mediation analysis model 8*

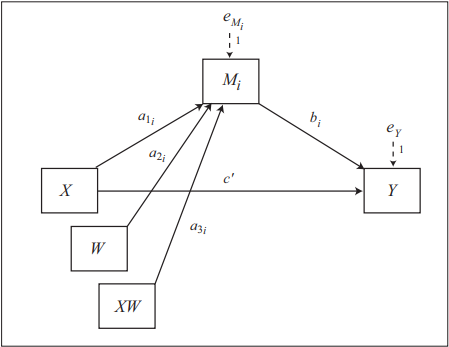
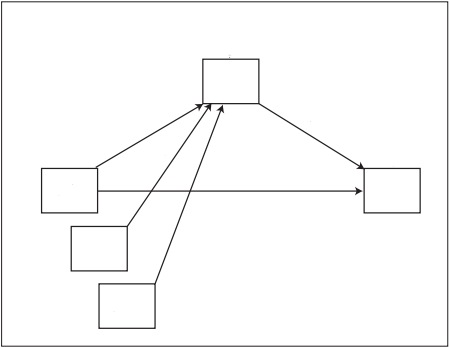
In order to determine the possible mediation-moderation effect in our model, model 8 in the PROCESS macro developed by Hayes was executed. Figure 3 depicts the statistical diagram with all the relevant paths for the model.

Figure 3: statistical diagram model 8 Hayes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model 1 Bootstrapping for Psychological Ownership | | | | |
| Variable | Path | Coeff | SE | P-value | |
| Level of customization (IV) | a1 | 0.5056 | 0.2489 | 0.0457 | |
| Type of features (MOD) | a2 | 0.3288 | 0.2858 | 0.2017 | |
| IV\*MOD | a3 | -0.5449 | 0.3706 | 0.1280 | |
| Gender (COV) |  | -0.2905 | 0.2099 | 0.1541 | |
| Cars knowledge (COV) |  | 0.1084 | 0.0450 | 0.0141 | |
| Favorite means of transportation (COV) |  | -0.12866 |  |  | |
| Age (COV) |  | 0.32726 |  |  | |
| Model summary |  |  |  |  | |
| Total | 0.0982 |  |  |  | |
| p | 0.0393 |  |  |  | |
| F | 1.7710 |  |  |  | |



PO

WTP

LC

TF

LC\*TF