

WHY EXTENDING EXAMINATION WITH NON-PARAMETRIC APPROACHES? INSIGHTS FROM A STUDY ON ADVERTISEMENT'S EFFECTIVENESS

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Abstract. *The paper presents the findings of an experimental study investigating advertisement effectiveness. It analyzes the similarities and the differences in consumers' responses to an advertised offer, as a function of emphasis framing (hedonic vs. utilitarian). The paper examines collected dataset using two different approaches: the analysis of variance (ANOVA) and the partial least squares multi-group analysis (PLS-MGA). Results derived from the two different approaches are compared and discussed, highlighting the additional findings gained via PLS-MGA regarding the moderating role of emphasis framing on the relationship between perceptions and purchase intentions. Testing the parametric differences arising from between groups design, ANOVA provides limited findings, while the non-parametric approach - PLS-MGA - estimates the effects of the experimental conditions on the structural model parameters, offering additional and more accurate results. Concluding that non-parametric approaches allow enhanced investigations, the paper explains why researchers should sometimes extend data examination using variance-based structural equation modeling as an exploratory tool.*

Keywords: *PLS-MGA; ANOVA; purchase intention; hedonic and utilitarian; advertising.*

Introduction

The impact of hedonic and utilitarian motivations on people's decisions has been heavily analyzed in social sciences, including consumer research and marketing literature (Ahtola, 1985; Batra & Ahtola, 1990; Crowley, Spangenberg & Hughes, 1992;

Hirschman, 1983, 1984, 1992; Hirschman & Holbrook, 1982; Holbrook & Hirschman, 1982; Holbrook, 1986).

Extant marketing studies have shown how hedonic and utilitarian frames of reference alter consumption goals, motivation focus, perceived benefits and buying decisions differentiating consumer reactions (Babin, Darden & Griffin, 1994, Dholakia, 2000; Spangenberg, Voss & Crowley, 1997; Khan, Dhar & Wertenbroch, 2004; Khan & Dhar, 2010; Parker & Wang, 2016; Kivetz & Zheng, 2016).

Considering previous findings on hedonic versus utilitarian purchase behaviors, showing that consumers respond differently to marketing communications efforts and promotions (Khan et al. 2004; Khan & Dhar, 2010; Kivetz & Zheng, 2016), our study assumes that different reactions might result in response to the same advertised offer from people using mostly hedonic (vs. utilitarian) lens of evaluating it, and it aims to find out ways of improving the advertising techniques.

Literature review

Considering utilitarian motivation to be based on necessity and the practical utility provided by the acquired good, while hedonic motivation to be based on pleasure and enjoyment (Ahtola, 1985; Batra & Ahtola, 1990), scholars agreed that each time people are buying, both hedonic gratification and utilitarian benefit counts, contributing in different proportions to the final decision (Hirschman & Holbrook, 1982; Babin et al., 1994; Parker & Wang, 2016).

Still, the relative weight of hedonic or utilitarian value enables people to perceive goods as primarily hedonic or primarily utilitarian (Batra & Ahtola, 1990). Although hedonic and utilitarian components are combined in each case, those products that are seen to primarily provide superior hedonic value are labeled as hedonic goods, and those that are seen to primarily provide superior benefits of utilitarian nature are labeled as utilitarian goods (Batra & Ahtola, 1990; Dhar & Wertenbroch, 2000).

Since the hedonic value of goods relates to consumer's pleasure, experiential and sensorial satisfaction and utilitarian value is functional and task-related, the products with higher utilitarian value represent the most part of daily purchases (Khan et al., 2004).

Although hedonic goods are more appealing, the guilt of indulging (Kivetz & Keinan, 2006; Keinan & Kivetz, 2008) and people's concern of providing themselves reasons that justify their decisions were found to lead consumer's tendency to frequently postpone hedonic acquisitions (Khan & Dhar, 2010; Kivetz & Zheng, 2016). Researchers have shown that consumers efforts to adopt prudent spending decisions directed to the fulfillment of objective needs, and the increased urge for justifying those acquisitions that are rather motivated by pleasure than utility determine a reduced frequency of hedonic (vs. utilitarian) purchases.

However, some of the marketing actions, such as non-quantity sales promotions, were found to act as external guilt-reducers, providing a perfect reason to justify hedonic goods buying (Kivetz & Zheng, 2016). More precisely, studying promotions influences

on hedonic vs. utilitarian acquisitions Kivetz and Zheng (2016) have found a higher effectiveness of price promotions on buying decision of hedonic rather than utilitarian goods for the case of price-per-unit discounts and other non-quantity promotions. Explained by the increased difficulty of justifying hedonic (vs. utilitarian) buying, non-quantity promotions were found to more effectively motivate hedonic (vs. utilitarian) acquisitions. As expected, reversed reactions were found for the case of quantity promotions (i.e. discounts for the acquisition of additional product units), because the difficulty to justify additional units buying of a hedonic good countervailed the benefit of the discount (Kivetz & Zheng, 2016).

On the other hand, consumer behavior literature have shown that people tend to be less price sensitive in their acquisition decisions if hedonic aspects of perceived value weigh more (Khan et al., 2004).

The decreased price sensitivity of hedonic (vs. utilitarian) acquisitions was understood in connection with buying low frequency and occasional consumption of hedonic goods. People's proneness to accept higher prices for buying goods of superior hedonic value was explained as a consequence of enjoyment motivation, pleasure associations and luxury desirability associated with occasional consumption (Khan et al., 2004).

Analyzing hedonic and utilitarian aspects into greater depth, Igou (2011) revealed the link between motivation focus on hedonic (vs utilitarian) benefits and the differences appearing in the priorities of goals and expectations that are configuring different information processing styles, different "mindsets" used for evaluation. The author pointed out the difference between "a hedonic mindset" focused on experiences and sensations, that uses a "valuation-by-feeling strategy" of evaluation, versus a "utilitarian mindset" focused on functionality that uses a "valuation-by-calculation strategy" of information processing, concluding that the "utilitarian mindset is more likely to promote cost-benefit analyses" (Igou, 2011), which totally explains the decreased price sensitivity in hedonic (vs. utilitarian) acquisitions.

Taking into account the information processing differences between hedonic vs. utilitarian "mindsets" presented by Igou (2011) as well as previous analyses on goal frames showing that a change of focus determines a change in "the way people process information and act upon it" (Lindberg and Steg (2007, p.118) we assumed that different reactions might result in response to the same advertised offer from people using mostly hedonic (vs. utilitarian) lens of evaluating it. Further, considering the increased sensitivity to emotional cues and decreased price sensitivity in hedonic (vs. utilitarian) goods acquisition indicated in the literature (Khan et al., 2004), we hypothesized that:

Hedonic (vs. utilitarian) framing influence advertisement's effectiveness, moderating the effect of perceptions on intentions as follows:

H1: hedonic (vs. utilitarian) framing increases the positive effect of perceptions on purchase intentions.

H2: hedonic (vs. utilitarian) framing increases the positive effect of perceptions on recommending intentions

Methodology

Data collection

The hypothesis that *hedonic (vs. utilitarian) framing influence advertisement's effectiveness, moderating the effect of perceptions on purchase (H1) and recommending (H2) intention* was tested using a between groups experimental study conducted with student participants (N=80, 50% F, M age =23).

Participants were invited to rate their opinions about a food delivery offer and its offerer based on the information contained in the advertisement presented during the study, being exposed to the same information excepting advertisement's call for action phrase, which emphasized either hedonic or utilitarian aspects between groups.

Participants' responses (1 to 7 ratings) concerning impressions about the product, the price-level, and additional offer-related opinions were collected as single-item variables, while the intention of purchasing and recommendations spreading, as well as participant's perceptions regarding the offerer, were measured using the multi-item constructs presented in Table 1.

The advertisement presented under an unknown brand-name a fast ("15 minutes") delivery offer for healthy ("100% natural ingredients") cooked meals, in order to facilitate hedonic (vs. utilitarian) framing, and to control for external influences (such as ambiance factors known to play important roles in consumer's evaluations of restaurants for example), or response variations between participants that might occur when judging complex, high-tech or rare consumption products.

The joy of eating, traditional cooking and sensorial hints were emphasized in the introductory call for action phrase to prompt participant's attention to hedonic side of the advertised offer in one group ("Enjoy our traditional food, cooked from 100% natural ingredients, baked in the wood-fired brick oven directly on hot bricks for having a healthy, full of tasty meal delivered hot at your door...") while speed, forwardness, modernity, mobile ordering add-ons (functional benefits) were emphasized in the other group to prompt participant's attention to utilitarian side of the advertised offer ("Enjoy a fast 15 minutes delivery and order our 100% natural ingredients food by phone call, website or mobile applications...").

Pretests performed with student participants (N = 18, 50% female, ages 20-30) indicated a successful framing: hedonistic considerations were significantly higher in one group (M =5.08 vs. M= 4.22, $t(16) = 3.1$, $p = .007$) and utilitarian aspects were significantly higher in the other (M = 3.88 vs. M = 5, $t(16) = 3.498$, $p = .003$).

Data Analysis

The similarities and the differences concerning participants' reactions to the advertised offer were analyzed as a function of hedonistic (vs. utilitarian) framing, using a parametric (ANOVA) and a non-parametric (PLS-MGA) method. Obtained results were compared and conclusions were drawn.

Results

Collected data were processed and compared between experimental conditions. Group means indicated good and very similar perceptions and behavioral intentions in both conditions, as it can be observed from statistics reported below.

Parametric analysis indicated no significant differences between groups, ANOVA results suggesting that participant's response to the advertised offer would be very much the same regardless hedonistic or utilitarian framing. No differences between groups on perceptions (CP – competence perception; WP - well-intended perception, price-level (P) or intentions (RI - recommend intention; PI – purchase intention) were found:

P: $F(1,78)=0.011$, $p=0.917$; $M=5.4250$ vs. $M=5.4500$;
CP: $F(1,78)=2.060$, $p=0.155$; $M=4.8438$ vs. $M=5.1125$;
WP: $F(1,78)=1.728$, $p=0.192$; $M=4.5563$ vs. $M=4.2688$;
RI: $F(1,78)=0.001$, $p=0.973$; $M=4.1000$ vs. $M=4.1083$;
PI: $F(1,78)=0.001$, $p=0.974$; $M=4.6500$ vs. $M=4.6563$;

ANOVA results rejected our assumption regarding the differences in advertisement's effect on behavioral intentions, depending on hedonic (vs. utilitarian) framing.

Still, the increased sensitivity to emotional cues and decreased price sensitivity in hedonic (vs. utilitarian) goods acquisition indicated in the literature (Khan et al., 2004) justified our expectations of between groups differences, especially regarding purchasing intentions.

Therefore, we decided to investigate further, and we resorted to the non-parametric analysis before concluding that our data rejects all research hypotheses.

PLS-SEM and MGA analysis and results

Before concluding that hedonistic (vs. utilitarian) framing wouldn't interfere in adjusting consumer responses to the advertised offer, an additional groups comparison was performed using structural equation modeling (SEM) and partial least squares multi-group analysis (PLS – MGA).

Examining the relationships between perceptions and intentions (figure 1) in each group and comparing corresponding path coefficients between experimental conditions, we considered that PLS – MGA offers the possibility to capture more subtle aspects that cannot be observed with parametric analyses.

Finally, the decision of employing a variance -based SEM technique was rooted on the extant recommendations indicating PLS-SEM use for explanatory analysis (Lowry and Gaskin, 2014).

Therefore we applied PLS-SEM method as indicated in Hair, Hult, Ringle, and Sarstedt (2014); Hair, Sarstedt, Hopkins, and Kuppelwieser (2014), and we performed the measurement and the structural model evaluations for each group resulted from hedonistic (vs utilitarian) framing. In the end, groups differences were estimated on

the structural model parameters using PLS – MGA analysis according to Sarstedt, Henseler and Ringle (2011) and the final conclusions were drawn.

Model evaluation on each group

The model presented in Figure 1 indicates all potential relationships between participants perceptions (CP and WP) and intentions (purchase – PI; recommend - RI) resulted in response to the advertised offer, as well as the hypothesized moderating effect of framing on these relationships.

To perform the PLS – MGA evaluation of the moderation that (hedonic vs. utilitarian) framing might exert on the effect of perceptions (CP; WP) on intentional response (PI, RI) to the advertised offer, the relationships between perceptions and intentions (Figure 1) should be analyzed for each group, and groups differences should be estimated on the structural model parameters, according to literature recommendations (Henseler, Ringle & Sinkovics, 2009; Sarstedt et al., 2011).

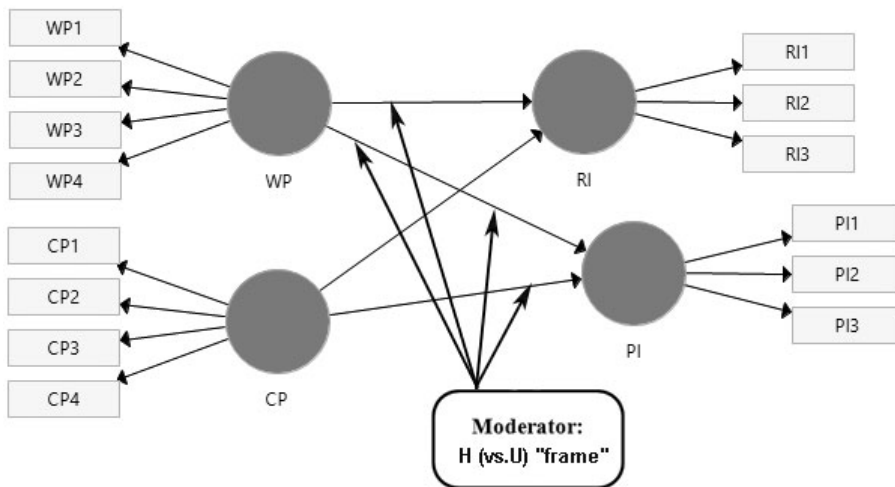


Figure 1. Research model

Measurement evaluation

In both hedonic and utilitarian groups PLS-SEM statistics point out that measurement model complies to method's recommendations of reliability (Nunnally, 1978); no cross-loadings (Chin, 1998); convergent and discriminant validity (Fornell and Larcker, 1981) - as indicated in Hair et al.. (2014) and detailed in the results reported in Table 1 (AVE > 0.5, Cronbach's alpha > 0.7, CR > 0.8), Table2 (no cross-loadings between construct's indicators) and Table 3 (discriminant validity criterion introduced by Fornell and Larcker, 1981).

Table 1. Measurement model: construct reliability and convergent validity

Construct and items	Utilitarian Group			Hedonic Group		
	α	CR	AVE	α	CR	AVE
CP (reflective construct: CP1; CP2; CP3; CP4)	0.798	0.868	0.623	0.814	0.877	0.641
WP (reflective construct: WP1; WP2; WP3; WP4)	0.777	0.856	0.602	0.924	0.946	0.814
RI (reflective construct: RI1; RI2; RI3)	0.796	0.881	0.713	0.928	0.954	0.875
PI (reflective construct: PI1; PI2; PI3)	0.885	0.930	0.815	0.865	0.918	0.788

Table 2. Cross Loadings

Correlations between indicators and composite scores	Utilitarian Group				Hedonic Group			
	CP	PI	RI	WP	CP	PI	RI	WP
CP1	0.713	0.425	0.065	0.039	0.775	0.533	0.376	0.309
CP2	0.864	0.453	0.342	0.403	0.784	0.602	0.557	0.377
CP3	0.804	0.488	0.319	0.381	0.828	0.663	0.559	0.510
CP4	0.767	0.396	0.332	0.193	0.814	0.697	0.414	0.369
PI1	0.562	0.955	0.582	0.559	0.740	0.928	0.661	0.476
PI2	0.450	0.918	0.526	0.475	0.605	0.890	0.720	0.466
PI3	0.493	0.832	0.380	0.417	0.725	0.842	0.667	0.559
RI1	0.458	0.535	0.941	0.605	0.595	0.727	0.955	0.738
RI2	0.284	0.536	0.778	0.449	0.651	0.819	0.954	0.660
RI3	0.104	0.334	0.806	0.538	0.430	0.597	0.896	0.656
WP1	0.286	0.506	0.575	0.771	0.363	0.573	0.720	0.903
WP2	0.279	0.431	0.502	0.866	0.507	0.535	0.666	0.940
WP3	0.339	0.493	0.507	0.832	0.404	0.434	0.550	0.860
WP4	0.125	0.156	0.435	0.608	0.518	0.489	0.690	0.903

Table 3. Discriminant Validity: Fornell-Larcker Criterion

Construct	Utilitarian Group				Hedonic Group			
	CP	PI	RI	WP	CP	PI	RI	WP
CP	0.789				0.801			
PI	0.558	0.903			0.784	0.888		
RI	0.352	0.555	0.845		0.603	0.768	0.935	
WP	0.346	0.540	0.655	0.776	0.496	0.567	0.733	0.902

Structural model evaluation and groups comparison

The PLS-MGA analysis with 5000 bootstrap samples was performed in SmartPLS 3 software (Ringle, Wende & Becker, 2015).

The structural model was evaluated for each group (see Figure 2, Table 4, Table 5) according to Hair, Hult, Ringle and Sarstedt (2014), and between groups differences were estimated on the structural model parameters (results reported in Table 6), according to Henseler et al. (2009), Sarstedt et al. (2011).

Structural model evaluation has shown that coefficients of determination R^2 (Table 4) are significant for each group.

Table 4. Structural model: coefficient of determination

Construct	Utilitarian Group	Hedonic Group
	R^2	R^2
PI	0.449	0.657
RI	0.447	0.613

β paths coefficients and statistical significance of the observed relationships (Table 5) indicate two effects that are significant in both groups: CP -> PI (β (hedonic) = 0.667, $p < 0.001$ and β (utilitarian) = 0.422, $p < 0.001$) and WP -> RI (β (hedonic) = 0.576, $p < 0.001$ and β (utilitarian) = 0.606, $p < 0.001$).

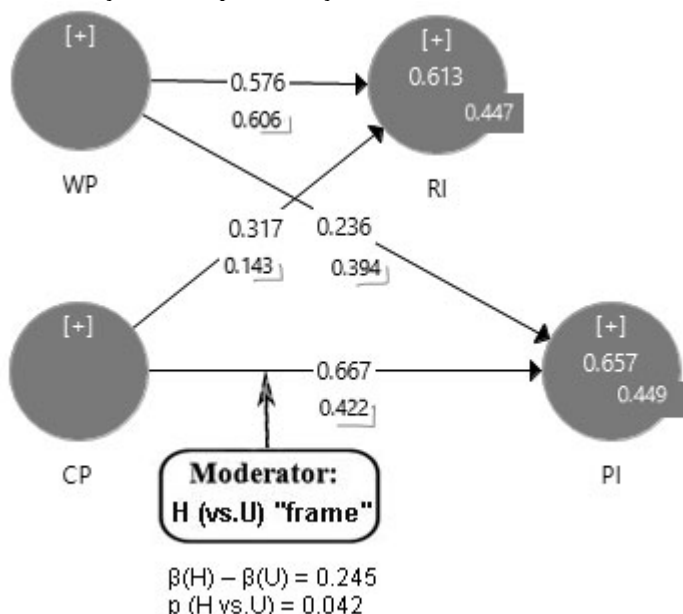


Figure 2. Structural model: R^2 and β path coefficients for both groups

(R^2 and β in hedonic "frame"- normal fonts; R^2 and β in utilitarian "frame" – smaller fonts and marked)

Table 5. Structural model: the effects of perceptions on intention

Effects	Utilitarian Group					Hedonic Group				
	β	T	P	2.5% c.i.	97.5% c.i.	β	T	P	2.5% c.i.	97.5% c.i.
CP→ PI	0.422	3.882	0.000	0.160	0.606	0.667	6.806	0.000	0.470	0.855
CP→ RI	0.143	1.144	0.253	-0.114	0.372	0.317	3.015	0.003	0.077	0.504
WP→ PI	0.394	3.648	0.000	0.154	0.585	0.236	1.734	0.083	-0.047	0.474
WP→ RI	0.606	6.222	0.000	0.368	0.761	0.576	5.853	0.000	0.323	0.728

As reported in Table 6, Parametric test and Welch-Satterthwait test fail to find differences between groups.

Still, the PLS-MGA non-parametric analysis indicate a significant effect difference at $p < 0.05$ between groups (see Sarstedt et al., 2011) arising from a significantly higher influence of CP on PI in hedonic (vs. utilitarian) condition ($|\beta(\text{hedonic}) - \beta(\text{utilitarian})| = 0.245$; $p\text{-value}(\text{hedonic vs. utilitarian}) = 0.042$) which shows the moderating role of framing on the relationship between CP and PI.

H1 hypothesis is partially confirmed by PLS-MGA results: hedonic (vs. utilitarian) framing increases the positive effect of competence perception on purchase intention.

No other significant effect differences were found between groups (see Table 6): the H2 hypothesis is rejected.

Results reveal that the results of both methods, ANOVA and PLS-MGA, reject H2 hypothesis and framing (hedonic vs. utilitarian) influence on the relationship between perceptions and recommendations spreading. Yet, only ANOVA rejects the H1 hypothesis, while PLS-MGA offers supportive evidence for H1, indicating the moderating effect of framing (hedonic vs. utilitarian) on purchase intention.

Table 6. Group comparisons: Hedonic vs. Utilitarian (H vs. U)

Effects (H vs. U)	Effect diff. $ \beta(H) - \beta(U) $	T (H vs. U)	Parametric test p-value (H vs. U)	Welch-Satterthwait p-value (H vs. U)	PLS-MGA p-value (H vs. U)
CP→ PI	0.245	1.651	0.103	0.107	0.042
CP→ RI	0.174	1.067	0.289	0.293	0.145
WP→ PI	0.158	0.926	0.357	0.360	0.819
WP→ RI	0.030	0.214	0.831	0.832	0.578

Conclusions and research limitations

Indicating the moderating role of framing on purchase intention, results revealed that prompting consumer's attention to the hedonic side of the advertised offer through an introductory call for action, the advertisement's effectiveness would increase, because (hedonic vs. utilitarian) framing magnifies the positive effect of perceived competence on purchase intention.

Besides direct implications for advertising techniques in food delivery field, the result also indicates that adding a hedonic appeal to the rational benefits (such as healthy food), organic food producers might increase their sales.

Although result application would provide important advantages for business practice, research limitations indicate that it should be used with caution in other settings. In this regard, we remind the very specific context of the present study: a healthy product; food delivery field. Moreover, we highlight that the study used hedonic (vs. utilitarian) framing to find out which one would increase the effectiveness of a specific advertisement. Further research is needed to extend investigation and to find out result applicability in other situations and activity fields.

Overall, our paper has the merit of depicting an important methodological issue. It shows that researchers should sometimes extend data examination using non-parametric approaches, despite the fact that ANOVA is an established method for the analysis of experimental results in marketing and behavioral studies.

As our results have shown, assessing only the mean differences arising from between groups design ANOVA technique failed to identify underlying behaviors, rejecting the assumed differences in advertisement's effect on behavioral intentions depending on hedonic (vs. utilitarian) framing, while the non-parametric approach, PLS-MGA, offered supportive evidence for the moderating effect of framing on purchase intention, offering insights of immediate applicability and high managerial value.

Concluding that non-parametric approaches offer the possibility to estimate the effects of between groups design on the structural model parameters allowing enhanced investigations, paper's results recommend PLS-MGA as a valuable instrument for explanatory analysis in between groups experiments. Calculating estimates that allow assessing the effects and explain consumers behaviors into greater depth, PLS-MGA (in our particular case), and variance based SEM (in general) provides more accurate and detailed explanations of consumer behaviors than parametric techniques, offering additional and valuable insights.

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