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Promotional benefits of 99-ending prices: The moderating role of intuitive and analytical decision style*

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Abstract

Evidence suggests that retailers use 99-ending prices as a promotional technique. This paper explores the consumer perceived benefits of such promotional practices and the information processing conditions under which hedonic benefits are higher (lower) than utilitarian ones. In line with the benefit framework of sales promotion proposed by Chandon, Wansink, and Laurent (2000), 99-ends are not expected to be strictly associated to monetary savings benefit but also to a more hedonic benefit, fulfilling consumer's needs for exploration. In addition, the analytic or intuitive consumer decision style (Mantel & Kardes, 1999) is likely to activate either the utilitarian benefit of savings or the hedonic benefit of exploration with more strength. The analysis of an on-line survey among 317 shoppers shows that both perceived savings and exploration benefits have a positive impact on proneness to buy 99-ends products with the saving benefits being stronger (weaker) for analytical decision makers (intuitive decision makers). The findings contribute to the better understanding of the image effect of 99-ends underlying its individual differences and help retailers and also pricing managers in their use of 99-ends as a promotional technique.

Keywords: 99-ending prices, image effect, perceived benefits, decision style

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1. Introduction

Nine-ending pricing is a common, and perhaps overused, marketing technique in Western markets (Nguyen, Heeler, & Taran, 2007). Up to 65% of all prices in the grocery retail market end with a 9 digit either in the US (Schindler, 2009; Schindler, & Kirby, 1997; Stiving & Winer, 1997), in New Zealand (Gendall, Holdershaw, & Garland, 1997) or in European markets such as Poland (Suri, Anderson, & Kotlov, 2004) or Finland (Aalto-Setälä, 2005). One of the underlying assumptions which encourage retailers to apply those prices is that consumers may consider 99-ending prices as a promotional signal (Ngobo, Legohérel, & Guéguen, 2010; Schindler, 2006). However, although 99-ending price is recognized to be a signal of a low price or a low quality product (Schindler, 2001), little is known about its potential effects as a promotional appeal. Until now, researchers have investigated the potential discount or good deal meanings of 99-ends (Quigley & Notarantino, 1992; Schindler & Kinbarian, 1998) assuming that monetary savings is the only benefit that motivates consumers to respond to 99-ends. Alternatively, Chandon, Wansink, & Laurent (2000) demonstrate that a promotional technique may provide consumers with hedonic benefits that are beyond monetary savings suggesting that consumers respond differently to hedonic and utilitarian benefits. Thus, there is a compelling need to investigate how and when 99-ends are used by consumers as a promotional signal.

This research attempts to explore the different benefits associated to the promotional signal of 99-ends and their effects on proneness to buy a product with 99-ends. Building on the utilitarian and hedonic promotional framework proposed by Chandon et al. (2000), we argue that 99-ends can provide both monetary savings (savings benefit) and purchase stimulation or variety seeking (exploration benefit). A

first group of hypotheses is elaborated to test the impact of savings and exploration benefits on the proneness to buy a 99-end product. This research goes a step further by explaining the decision process under which the hedonic benefit of exploration can have a stronger (or lower) effect on proneness to buy a 99-end product than the utilitarian benefit of savings. Based on the distinction in information processing strategies between the *analytic*, attribute-based decision makers, versus the *intuitive* attitude-based decision style (Mantel & Kardes, 1999), we propose that analytical decision makers are expected to focus more on monetary savings benefits whereas intuitive decision makers should rely more on non-monetary benefits such as exploration.

Our research contributes to the better understanding of the image of a good deal effect of 99-ends underlying its individual differences, and draws accordingly three main conclusions: (i) monetary savings are not the only consumer benefit of 99-ends promotional appeal, (ii) perceived benefits of a “99- promotion” differ according to consumer decision style, (iii) analytic decision makers are more likely to look for savings benefits while intuitive decision makers are more sensitive to the hedonic benefit of exploration. Theoretically, this paper attempts to bridge the marketing literature on promotional benefits with the psychological literature on decision style to assess whether a promotion provides different benefits to different decision makers. Managerially it allows retailers and pricing managers to implement more effectively 99 ends as a promotional technique. Stressing the right promotional benefit for a specific target of consumers is likely to increase consumers’ perceived benefits and also company sales.

After a brief literature review and summary of our hypotheses, we describe the field survey conducted. We follow up with the presentation of the results and, finally, a discussion of our theoretical and managerial implications.

2. Hypotheses development

2.1. *The 99 ending price as a promotional appeal*

People categorize price information according to different meanings, which is called the “image effect” (Schindler, 2001). Shoppers are likely to associate a certain “image” of low price when they are exposed to 99-endings. Laboratory experiments evidence that 99-ends compared to 00-ends are judged as prices that have not been increased (Schindler, 1984), as discount prices (Quigley & Notarantino, 1992) or as products that are on sale (Schindler & Kibarian, 1998).

Consumers may have learned this low price meaning of 99-endings from associating them to low priced products in the marketplace. However, the analysis of 120 branded consumer products among 10 retailers shows that 99-ending prices are not relatively low ones but actually higher prices than those prices that end in the digits 00 through 98 (Schindler, 2001). This discrepancy between image and reality, called the “99-meaning paradox”, suggests that the low price image of 99-ends is learned and maintained in consumers’ mind through the observation of retailers’ practices. The analysis of two large samples of newspaper price advertisements indicate that there is a strong and robust correlation between the use of the 99 price ending and the presence of a low-price appeal such as a claimed discount (Schindler, 2006). Cross-sectional panel analysis also confirms that 99-ending prices are more likely to appear among product categories with a high promotional level (Ngobo et al., 2010).

Therefore, the image of a low price associated to 99-ending prices is probably due to the common use of retailers of those rightmost digits as a promotional technique. Consumers may conclude to a “promotional signal” from reading the right-hand digits leading them to choose the 99-ending price option.

2.2. *Utilitarian and hedonic benefits of 99-ending*

So far, we argued that 99-ending prices are used by retailers and perceived by consumers as promotional signals. Now, we examine the utilitarian and the hedonic benefits of such a promotional technique. The utilitarian approach in consumer attitude refers to the product's functional attributes and focus on instrumental expectations whereas the hedonic aspects rely on sensory attributes and focus on experiential expectations (Batra & Athola, 1991). Promotional benefits have been also classified into utilitarian and hedonic patterns (Chandon et al., 2000). Building on these frameworks, we propose that 99-ends promotional benefits are based on utilitarian expectations such as "savings" and on a hedonic experience such as "exploration".

Savings refers to the monetary benefit realized with the promoted product (Chandon et al., 2000) by either a price reduction or a bigger quantity for the same price. The exploration benefit refers to the stimulation of an intrinsic need for trying new things, products or brands (Chandon et al., 2000; Raghurir, Inman, & Grande, 2004). This exploratory behaviour gives pleasure while responding to consumer's curiosity. Baumgartner and Steenkamp (1996) define the exploratory acquisition of products as the potential for sensory stimulation in product purchase through risky and innovative product choices, and varied and changing purchase experiences.

Until now, researchers have investigated the potential discount or good deal meanings of 99-ends (Schindler & Kibarian, 1998; Quigley & Notarantino, 1992) assuming that savings is the only benefit that motivates consumers to respond to 99-ends. However, monetary savings cannot fully explain consumer responses to a promotional signal (Chandon et al., 2000) and responses to prices have a strong emotional component (O'Neill & Lambert, 2001). Above and beyond any monetary savings, consumer may respond to a 99-ends promotional signal because it provides intrinsic stimulation and help them fulfil needs for information and exploration.

Therefore, we expect both savings benefits and exploration benefits to affect the proneness to buy a 99-end product. We propose that:

H1: Proneness to buy 99-ends products is positively affected by the promotional:

- a. Hedonic benefit of exploration of 99-ending prices, and
- b. Utilitarian benefit of savings of 99-ending prices.

2.3. *The moderating effect of decision style*

That 99-ending prices provide both savings and exploration benefits suggests that the proneness to buy products ending with 99 digits may depend on the match that these benefits have with the purchase situation. In particular, we argue that the impact of each perceived benefit of 99-ends (i.e., savings or exploration) may be significantly different according to the consumer's decision style.

Consumers use a wide variety of information processing strategies to evaluate products and to make decisions. In cognitive psychology, a common distinction is to consider the use of an *analytic*, attribute-based processing versus an *intuitive*, attitude-based processing (Mantel & Kardes, 1999). The analytical and intuitive thinking style contributes to the prediction of a variety of personal and socio-psychological measures such as personality, achievement or interpersonal relations (Epstein, Pacini, Denes-Raj, & Heier, 1996). For instance, considering the big five aspects of personality, Pacini and Epstein (1999) demonstrated that an analytical thinking style was strongly and directly related to openness and conscientiousness and it was strongly inversely related to neuroticism and conservatism. Although there is little evidence about the impact of decision style in a shopping context, we propose that consumer decision style is an appropriate moderator of attitudes and behaviours towards the products.

The analytics diligently, actively, and cognitively evaluate information, so they should be more focused on attribute-based information to make their judgment. In the context of promotion, they should be more sensitive to the monetary or utilitarian benefits (savings by a price reduction or getting more volume for the same price) than to the non-monetary and hedonic benefits. In contrast, consumers engaging in the intuitive mode do not try to optimize every decision focusing on attribute information but rather prefer to make a good decision with an attitude-based process of information. They are thus strongly influenced by non-monetary benefits related to promotion, such as the exploration benefit that mitigates consumers' thrill of trying new brands and products.

The research conducted by Inman, McAlister, and Hoyer (1990) support these expectations. They show that high need for cognition individuals tend to make more optimal purchase decisions because they react to a promotional signal only when a significant price reduction is offered; thus, analytical decision makers are likely to consider the savings benefit associated to the promotional technique of 99-ends products more strongly. Conversely, the study shows that low need for cognition individuals react to a promotional signal when the product appears to be on special regardless of the amount of price reduction. Thus, we can consider that intuitive decision makers are likely to rely on other information different from price when considering promotional benefits. Based on the above, we propose the following hypotheses:

H2a. For *intuitive* decision makers, proneness to buy 99-ends products is more influenced by the 99-promotional *hedonic benefit of exploration* than by the 99-promotional utilitarian benefit of savings.

H2b. For *analytical* decision makers, proneness to buy 99-ends is more influenced by the 99-promotional *utilitarian benefit of savings* than by the 99-promotional hedonic benefit of exploration.

3. Methodology

3.1. Sample

An on-line questionnaire was conducted over a two-week period in Spain where 99-ends are commonly used by grocery retailers (Álvarez, Burriel, & Hernando, 2010). A total of 317 shoppers were selected across all Spanish geographic zones thanks to the GFK Internet Panel. A quota-sampling technique was used to ensure age group and gender representativeness.

The sample characteristics reflected Spain's population characteristics as underlined in the Spanish National Statistics Institute's latest census (www.ine.es). The median age of the sample was 34.4 years (in a 20-50 range) and it was equally split in terms of shoppers' gender (Male= 157, Female= 160). Approximately half of the respondents reported an average monthly per capita income of more than €2500 (8.2% from €240 to €1200; 31.4% from €1201 to €2400; 24.2% from €2401 to €3600; 19.5% €3601 and over, "no response" = 16.7%). Sample was drawn from a relatively high educational background (No schooling = 0.9%, Elementary school= 1.6%, Middle school= 5%, High school= 37.7%, 2 years at College / University= 23.3%, 4 years at College / University= 30.5%, Other= 0.9%).

3.2. Variables and measures

3.2.1. Independent variables: Savings (*utilitarian benefit*) and Exploration (*hedonic benefit*)

Respondents rated their perceptions of savings benefit and exploration benefit associated to 99-ends on two scales developed by Chandon et al. (2000) for sales

promotion. Respectively, the three items of savings benefit (“With a promotion/99-ends product: 1. I really save money, 2. I feel that I am getting a good deal, and 3. I really spend less”) were rated on a Likert scale ranging from 1 to 5, and loaded high on one dimension ($\alpha=0.89$). For the scale of exploration benefit, respondents rated their perception on three items in the case of 99-ends (“With a promotion/99-ends product: 1. I feel like trying new brands, 2. I can avoid always buying the same brands, and 3. I can get new ideas of things to buy”). These items measuring exploration benefit of 99-ends also loaded high in one dimension ($\alpha=0.91$). Both scales present good consistency.

3.2.2. Dependent variable: Proneness to buy 99-ends products

We used a reduced version of the scale of deal proneness proposed by Lichtenstein, Ridgway, and Netemeyer (1993). Respondents rated their agreement with four statements on a 5 points Likert scales: “I have favourite brands, but most of the time I buy the brand that has a 99-ends”, “one should try to buy the brand that has a 99-ending price”, “I am more likely to buy brands that ends with 99 prices”, and “Compared to most people, I am more likely to buy brands that have a 99-ends”. They loaded high on one dimension ($\alpha=0.92$). This scale also presents good consistency.

3.2.3. Moderator variable: Decision-making style

We measured the respondents’ tendency to use either an analytical or intuitive mental strategy for processing brand-related information and making a decision (Mantel & Kardes, 1999). This Likert scale, ranging from 1 to 5, has six items: “In making decision, I focus more on my personal impressions and feelings rather than on complex tradeoffs between attributes (reversed item)”, “The answer just come to me (reversed item)”, “ I try to use as much attribute information as possible”, “I carefully compare the brands on several different attributes”, “My decision is based on facts rather than on general impressions and feelings, and “My decision is based on careful thinking and

reasoning”. The factorial analysis did not confirm the unidimensionality of the construct, showing that the two first reversed items were loading on a second dimension. We kept the 4 last items that explain more than 50% of the variance ($\alpha=0.68$). Since this construct is used as a moderator we calculated the mean value of these four items to create an index of decision-making style. Values close to 1 signal a more intuitive processing whereas values close to 5 represent a more analytic processing style.

Based on this index, we formed two groups (the intuitive decision makers and the analytical decision makers) for testing H2a and H2b. Consistent with Baron and Kenny (1986), we decided to dichotomize the moderating variable (i.e., decision style) because it is expected to alter the independent (i.e., promotional benefits) and dependent (i.e., proneness to buy) relation in a step function but not in a linear or quadratic function. Unfortunately, theories in social psychology are not precise enough to specify the exact point at which the step in the function occurs. Therefore, to differentiate clearly the intuitive group from the analytical group, we decided to take into account two extreme groups: the first quartile for the intuitive decision makers (quartile 1= 80 observations with values between 1 and 3) and the fourth quartile for the analytical decision makers (quartile 4= 105 observations with values between 4 and 5). Note that we also test the moderating effect of decision style as a continuous variable and results were in line with our predictions.

Insert Table 1 about here

3.2. Procedure

Each respondent was selected on-line according to age and gender and asked about shopping habits for low priced and frequently consumer goods, purchase intention

and decision making for brands with .99, .00, .80 and other price endings and beliefs towards 99-ends practice.

In a first part of the survey respondents were presented with a competitive and realistic choice context. They were asked about utilitarian and frequently purchased products for which 99-ending practices is common, such as pasta and detergent. Shoppers indicated their involvement and familiarity with such products. Subsequently, they reported their purchase intention for the four most popular brands in each product category with prices ending with .99; .00 or other common right-hand digits. Then, they had to report on the way they make purchase decisions: we measured the respondent's tendency to use either an analytical or intuitive mental strategy for processing brand-related information and making a decision.

In a second part respondents were invited to evaluate 99-ending practices in general in order to measure the image and perceived benefit of those price endings. They were asked about their proneness to buy 99-endings, then, respondents had to evaluate their perceived benefits in terms of savings and exploration associated to 99-ends practices. Socio-demographics information such as income and education was gathered at the end of the questionnaire.

3.3. Analyses

We test the hypotheses using structural equation modeling based on the Partial Least Squares (PLS) algorithm. This consists of an iterative process that maximizes the predictive and explanatory power of the model, which is assessed in terms of the R-square value of the dependent variable: it explains 52% of proneness to buy 99-ends for the total sample and 53% for the intuitive processing style group, and 61% for the analytical processing style group (see Table 3).

Tables 1 presents the measures' loadings for the three model estimations and the average variance extracted for each construct (AVE). Table 2 presents the validity analysis of the measures and constructs for the total sample and the two groups (intuitive and analytic). Discriminant validity was tested by comparing the AVE of each construct with the shared variance between constructs (Fornell & Lacker, 1981): for each construct the AVE's squared root exceeds its shared variance with the other constructs confirming that the constructs are independent from each other.

Insert Table 2 about here

4. Results

Based on the psychometric properties of the models, it is concluded that the proposed model reasonably fits the data. Figure 1 presents the model estimation for the total sample and the estimation for the two processing style groups. Table 3 reports the standardized coefficients for the model estimations and the R^2 for the dependent variable of the model: proneness to buy.

Insert Figure 1 and Table 3 about here

Hypothesis 1 predicted that both utilitarian and hedonic benefits will be relevant in the proneness to buy a product with a 99-ending price. Table 3 shows that the effect of savings (utilitarian benefit) is positive and significant at .001 level ($\beta = .33$), as well as the effect of the hedonic benefit: exploration ($\beta = .46$), thus H1 is supported.

Hypothesis 2 predicted that the effect of savings would be higher for the analytic group whereas the effect of exploration would be higher for the intuitive group. To test this prediction we need to compare whether the differences between standardized coefficients of both processing style estimations are significantly different. We used the standard errors from the bootstrap output of the PLS estimation as suggested by Chin (2000) to compare them. Table 4 shows the pooled estimator for the variance (S pooled)

between each pair of coefficients and the t value for the differences (see the appendix for the t-test formulae, which follows a t-distribution with $m+n-2$ degrees of freedom). Results show that the differences are significant and in the predicted direction: the effect of savings (utilitarian benefit) on proneness to buy is higher for the analytic group ($\beta = .54$) than for the intuitive group ($\beta = .07$); and the effect of the exploration (hedonic benefit) is higher for the intuitive group ($\beta = .68$) than for the analytic group ($\beta = .31$), thus H2 is also supported.

Insert Table 4 about here

5. Discussion

5.1. Conclusion

The purposes of this paper were to identify the savings and exploration benefits of 99-ends and to examine the moderating effect of consumer decision style (analytical vs. intuitive). This study of the “how and when” 99-ends are used by consumers as a promotional signal allows us to draw the following conclusions:

- 1) Monetary savings are not the only perceived benefit of 99-ends promotional appeal: Both exploration benefit and savings benefit are significant predictors of the 99-ends proneness;
- 2) The impact of savings benefit (utilitarian) and exploration benefit (hedonic) on proneness to buy 99-ends are significantly different between analytical and intuitive decision makers: analytical decision makers give more importance to the monetary savings benefit and less importance to the exploration benefit than the intuitive decision makers.

5.2. Theoretical implications

This research contributes to a better understanding of the image effect associated to 99-ends. Until now, 99-ends image has been approached as a broad concept of low

price meaning. Researchers have investigated the potential discount or good deal meanings of 99-ends (Schindler & Kibarian, 1998; Quigley & Notarantino, 1992) assuming that savings is the only benefit that motivates consumers to respond to 99-ends. We have proposed a more actionable and marketing oriented approach such that 99-ending price might be considered as a promotional technique. In line with Chandon et al. (2000), we demonstrate that monetary savings cannot fully explain consumers' responses to 99-ends. Because they create an ever-changing environment, 99-ends promotion can also provide stimulation and help fulfil consumers' needs for information and exploration.

This research also adds to the body of evidence about the role of thinking style (Epstein et al., 1996; Wittman, van den Bercken, Claes, & Godoy 2009) and price cognition (Inman et al., 1990; Suri & Monroe, 2001). Studies in psychology have yet identified aspects of personality or social interaction that are related to analytic or intuitive thinking style (Epstein et al., 1996). Our study underlines that we can draw a marketing oriented profile of intuitive decision makers opposed to analytical decision makers. Intuitive decision makers are more likely to look for the hedonic experience and stimulation provided by the product on overall whereas analytical decision makers are more likely to focus on the product's attributes and their functional benefits.

5.3. *Managerial implications*

Studying the consumer benefits related to 99-ends promotions has practical implications in order to improve promotion effectiveness. Above all, retailers and pricing managers need to be aware that 99-ending price is not strictly a signal of a good deal and that, actually, this assumption is not true for all consumers. The 99-ends practice can be effective for either consumers who are looking for monetary savings or for consumers that are searching for variety and stimulation. When consumers are more

likely to analytically and carefully compare brands' attributes, retailers should use 99-ends promotion as a price reduction or discount techniques enhancing monetary savings. By contrast, when consumers are more intuitive and attitude-based decision makers, 99-ends practice is particularly effective underlying its exploration benefit. Alternatively, communication of 99-end products can highlight different benefits for diverse groups of consumers, as it has been proved that consumers tend to use predominantly one of the two thinking styles: analytical or intuitive (Witteman et al., 2009).

5.4. *Limitations and future research*

One of the key limitations of this paper is to examine how robust the results reported are to socio-demographic variables (e.g., age, income), marketing variables (e.g., product category knowledge, purchase frequency) and individual differences in price-sensitivity (e.g., price consciousness) that have been shown to affect consumers responses to prices (Wakefield & Inman 1993). Note that we only test the promotional benefits derived from 99-ends so we did not test for the “low quality” meaning, which should decrease the likelihood of choosing a 99-ending price. Also, it is important to note that the shopping context considered products with prices between 1 and 9 euro, thus our findings are not generalizable to expensive products. Further experimental research building on perceived drawbacks or on other utilitarian and hedonic benefits (quality, convenience, value expression and entertainment) would enrich the meaning of 99-ends as a promotional signal.

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Table 1: Constructs and measures

Construct	Standardized Loadings			Average Variance Extracted		
	Total Sample	Intuitive proc.	Analytic proc.	Total Sample	Intuitive proc.	Analytic proc.
Savings benefit (Chandon, Wansink & Laurent, 2000)				0,82	0,79	0,85
I really save money	0,76	0,67	0,78			
I feel that I am getting a good deal	0,88	0,86	0,89			
I really spend less	0,82	0,84	0,87			
Exploration benefit (Chandon, Wansink & Laurent, 2000)				0,84	0,84	0,87
I feel like trying new brands	0,81	0,78	0,87			
I can avoid always buying the same brands	0,86	0,84	0,88			
I can get new ideas of things to buy	0,85	0,91	0,86			
Proneness to buy (Lichtenstein, Ridgway & Netemeyer, 1993)				0,81	0,82	0,86
I have favourite brands, but most of the time I buy the brand that's on sale/99	0,78	0,73	0,84			
One should try to buy the brand that's on sale/ 99 ending	0,76	0,84	0,85			
I am more likely to buy brands that are on sale/ 99 ending	0,84	0,83	0,89			
Compared to most people, I am more likely to buy brands that are on sale/99	0,84	0,88	0,87			

Table 2: Psychometric Properties of Constructs

	Intercorrelations		
Total sample (n = 317)	1	2	3
1. Utilitarian/ savings	0,906		
2. Hedonic/ exploration	0,635	0,917	
3. Proneness to buy	0,626	0,674	0,898
Intuitive processing (n = 80)	1	2	3
1. Utilitarian/ savings	0,890		
2. Hedonic/ exploration	0,616	0,919	
3. Proneness to buy	0,493	0,727	0,905
Analytic processing (n = 105)	1	2	3
1. Utilitarian/ savings	0,919		
2. Hedonic/ exploration	0,677	0,934	
3. Proneness to buy	0,746	0,673	0,928

Note: The diagonal (in bold) gives the square root of AVE

Table 3: Model estimation summary

	Total sample (n=317)	Intuitive proc. (n=80)	Analytic proc. (n=105)
Relationships			
Utilitarian > proneness to buy	0,33 **	0,07	0,54 **
Hedonic > proneness to buy	0,46 **	0,68 **	0,31 **
R² Dependent variable (%)			
Proneness to buy	52	53	61

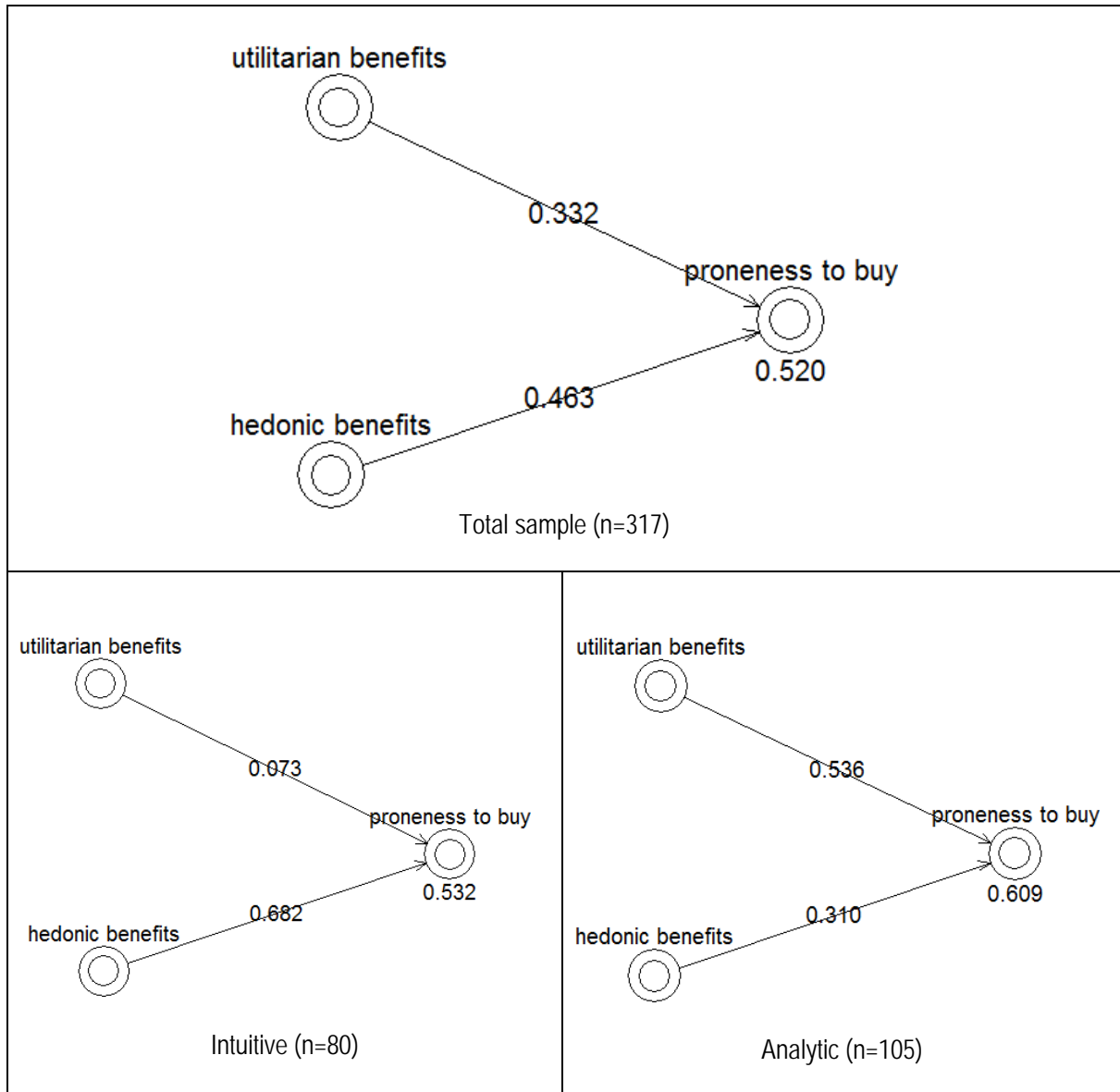
Notes: ** significant at 1% level (t > 2,576)

Table 4: Differences between coefficients

Relationship	Intuitive process		Analytic process		Spooled	<i>t value</i>	<i>t value notes</i>
	<i>coeff.</i>	<i>SE</i>	<i>coeff</i>	<i>SE</i>			
sample size	80		105				
Utilitarian > proneness to buy	0,073	0,0685	0,536	0,0786	0,725	-4,31 *	analytic > intuitive
Hedonic > proneness to buy	0,682	0,0794	0,310	0,0940	0,859	2,92 *	intuitive > analytic

Notes: SE: standard error from bootstrap simulations; S pooled: pooled estimator for the variance;
* significant at 1% level ($t > 2,576$)

Figure 1: Path diagram of model estimation



Appendix

$$t = \frac{Path_{sample_1} - Path_{sample_2}}{\left[\sqrt{\frac{(m-1)^2}{(m+n-2)} * S.E.^2_{sample1} + \frac{(n-1)^2}{(m+n-2)} * S.E.^2_{sample2}} \right] * \left[\sqrt{\frac{1}{m} + \frac{1}{n}} \right]}$$

where m is sample size 1 and n is sample size 2