

While Number Superstitions Exist: The Influence of Prices on Mobile Phone Consumers Purchase Intentions

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Abstract

This study tests a conceptual model of the effects of number superstitions and price on perceived price fairness and purchase intentions in Taiwan. The mediating effects of perceived price fairness on purchase intentions are also explored. The experimental results indicate that, for auspicious mobile numbers with a price premium, consumers will perceive price fairness which positively influences their purchase intentions. On the other hand, consumers show low purchase intentions with regards to inauspicious mobile numbers with a price discount because they may believe in using inauspicious mobile numbers will bring bad luck. Thus, number superstitions are significant in the Taiwan mobile telecommunication market. Through a discussion of the integration of number superstition and price in consumers' purchase process, this research helps the mobile telecommunications industry understand the phenomenon and adopt a suitable price policy. The work concludes with suggestions for future research.

Keywords: Superstition; Price fairness; Purchase intention; Mobile telecommunication

Introduction

China has a long history of 5000 years and studies have indicated that the superstitions and beliefs of Chinese societies exert a particular influence on individual behavior and, by consequence, managerial decision-making within those societies [1]. Avoiding certain numbers and engaging others is a part of the superstitious phenomenon, even in the West. For example, hospitals, along with most hotels and many other buildings, regularly do not label thirteenth floors in the U.S. while, in China and Taiwan, "fourth" floors and sometimes "fourteenth" floors are not labeled because the word for the number "4" and the word for "death" sound almost identical in Chinese [2]. On the other hand, people in Taiwan prefer auspicious numbers, such as 6, which means luck; 8, which means rich; and 9, which means longevity. While not all people believe the number superstitions, many prefer auspicious numbers to inauspicious ones because, well, why take a chance?

The mobile telecommunication industry has seen significant growth in recent years. According to eMarketer [3], the forecast shows the number of mobile phone users will be over 2.1 billion mobile phone users in Asia-Pasific. With the increasing usage of mobile phones, service providers may apply the superstition concept to generate a price premium for an auspicious mobile number or offer a price discount for an inauspicious mobile number.

The current study attempts to integrate number superstitions and prices into the purchase intention framework. In particular, it attempts to determine how the combination of number superstitions and prices affect customers' perceptions of prices and purchase intentions and to understand how perceived price fairness under these circumstances affects customers' purchase intentions. The answers to these questions will contribute to a better understanding of consumer behavior in Taiwan's mobile telecommunication market.

Literature Review

Customers superstitions

Chinese people are among the most superstitious in the world [1]. Chinese culture is steeped in superstition, with numbers playing a major role in birthdays, wedding dates, phone numbers, and naming.

The digit eight in Chinese (ba) is similar in pronunciation to fa, which means "to get rich" or "enrichment," and to fu, which means "lucky". The digit eight is thus associated with both prosperity and good luck, two characteristics that are particularly desirable in commercial interactions. On the other hand, the digit four (si) is pronounced exactly the same as "to die," except for the tone, and is thus associated with death [4]. Therefore, digit six, eight and nine are considered lucky numbers (i.e., auspicious numbers) while digit four, seven and even one are considered more unfortunate (i.e., inauspicious numbers).

According to the Cambridge Advanced Learner's Dictionary, "superstition is a belief which is not based on human reason or scientific knowledge, but is connected with old ideas about magic, etc". Various superstitious thinking may influence consumer choices in different ways because superstition is also relative to time and place. For instance, it play a role in many economic settings, such as allowing an apartment with a "lucky address" to command a price premium [5] and an "unlucky" apartment next to a murder to suffer a price discount [6], since a consumer may be willing to pay more to avoid an "unlucky" residence. Dixit et al. [7] found that some consumers are willing to pay for "directly unproductive" activities, such as living in a "lucky" apartment, and superstitions reflect this observation. Superstitious beliefs can predict positive outcomes (e.g., finding a penny will bring good luck) and negative outcomes (e.g., stepping on cracks will bring bad luck) [8]. Hence, most superstitions have two different parts: good luck and bad luck. The effect of superstitions differs from person to person, as some ignore them, some play with them for fun, and some take them so seriously that they become almost totally dominated by them in conducting their daily lives.

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Although superstitions have played an important role in business decision making [9], studies that address superstition in consumers' purchase intentions or decisions are scarce. This study examined prior research as a basis for various theoretical models [10] and attempted to explain the prevalence of superstitious thinking in price perceptions and purchase intentions.

Prices

Price can be defined as "the consumer's perceptual representation or subjective perception of the objective price of the product" [11] and is unquestionably one of the most important cues utilized during a consumer's decision-making process [12]. Lin et al. [13] also indicated that using price information as an indicator of quality or sacrifice may further influence how consumers choose products. In contrast to traditional microeconomic theory, demand-based pricing scientists see price as the equivalent of customers' perceived utility. However, setting prices to create customer value requires some insight into how a service or product can create additional value for the customer, especially when that additional value comes from something as intangible as superstition. Empirical evidence has demonstrated the effect of superstition on the price of a product; for example, Woo et al. [14] investigated the auction prices in a license plate market and found that the superstition effect on the number 13 no longer has a significant effect on the auction price in Chinese societies, although the effects of 4 and 8 remain significant, if opposite. Woo et al. [2] also showed that plates with proportionally more lucky numbers are more valued by bidders than are those with fewer lucky numbers.

However, a price premium or a price discount may apply to marketplaces in general. Price premium is defined as high prices that lead to above-average profits for the same product [15], while a price discount occurs when a manufacturer issues a comparatively low price, e.g. a discount or coupon, on a certain product or service [16]. Regardless of these premiums and discounts, consumers may carry with them a latitude of acceptable prices for a given product category and judge the actual price of a product to be high, too low, or fair in comparison with these internal standards [17].

Based on the number myth, the mobile telecommunication industry in Taiwan often applies the assumption of superstitious effect to promote inauspicious mobile numbers at a price discount and to raise auspicious mobile numbers to a price premium. Different levels of prices in the mobile numbers will lead to different consumers' evaluations. Consumers who choose auspicious mobile numbers and pay a price premium demonstrate their superstition, while inauspicious mobile numbers with a price discount will attract consumers with low superstitious thinking.

Perceived fairness

Research shows that one important way in which consumers can respond to a price is in terms of its perceived fairness [18]. Perceived fairness has been defined as "a judgment of whether an outcome and/or the process to reach an outcome is reasonable, acceptable or justifiable" [19]. Fairness is the belief of the justice of an outcome, process, or interaction [20], which can be categorized as distributive and procedural [21], where distributive fairness relates to the fairness of decisions and procedural fairness relates to the fairness of the processes used to produce the decisions [22] and the two do not usually function separately. Kukar-Kinney et al. [23] contended that, in many circumstances, people make a fairness judgment when they know the distribution of the outcome and the procedure that leads to the

outcome. Collie et al. [24] suggested that, when consumers recognize that the service provider's procedures and policies are fair, they are more likely to perceive the outcome as fair. This is known as the fair process effect. All things being equal, consumers view lower prices as more fair than they do higher prices [25], but price fairness perceptions are also affected by congruence. Thus, a price perceived as fair in one type of environment may be perceived as unfair in another [26]. According to the preceding review of the literature, if customers believe that a price is actually favorable to obtain the auspicious number, the likelihood of good price fairness and value judgments increases, vice versa. I predict, then, that consumers who subscribing to Chinese superstition will endeavor to "appease the spirits" by choosing phone numbers with auspicious numbers and avoiding inauspicious numbers.

H1. An "auspicious" ("inauspicious") mobile number with a price premium (discount) will positively affect consumers' perceptions of perceived price fairness.

Purchase intentions

In prior research, the issues of price premium or price discount and their impact on price perceptions and purchase intentions in marketplaces have been widely examined [27]. Purchase intention is defined as "the degree of intention to perform product purchase" [28]. Consumer purchase intentions refers to the likelihood or the probability of purchasing a product; it is the real action of buyers [29], since purchase intentions or shopping intentions have been widely used in the literature as a predictor of subsequent purchase [30].

Consumers' perception of price fairness subjectively depends on their comparison of a market price to a single, internal reference price. The adaptation-level for judging the price of a product is called the internal reference price and is often the average market price or in a range of average prices for a product class [31]. Given the role of reference price in product evaluations, any effect on the internal reference price should affect price evaluations and, thus, purchase intentions [32]. Indeed, when customers' perception is that a price is unfair, they react in ways, such as lower purchase intentions, that produce negative consequences for firms [18,19]. Conversely, Kukar-Kinney et al. [23] found a link between perceived price fairness and intention to purchase a product. Thus, the hypotheses are:

H2. An "auspicious" ("inauspicious") mobile number with a price premium (discount) will positively affect consumers' purchase intentions.

H3. Purchase intentions will be positively influenced by perceived price fairness.

Methodology

Participants

Three hundred twenty undergraduate students from a university in North Taiwan signed up to complete the questionnaire in exchange for partial credit in a consumer behavior course. The student subjects were selected in this study for three reasons. First, according to the 2008 Taiwan mobile users' survey report (Institute for Information Industry), college students are greatest proportion of mobile users. Second, mobile consumers generally are younger and better educated than conventional consumers, meaning that the student subjects closely resemble the mobile consumer population. Finally, the use of students as subjects in this study can decrease the effect of variance in age, gender, and the income level. About the respondents, the age range of the subjects was 18-25 years. Over half of the sample (51.9%)

was female, and most respondents were university-educated with a monthly personal income level of less than NT \$ 20,000.

Procedure

This study examined the hypotheses in an experimental setting. The experiment had a 2 (prices: premium vs. discount) × 2 (mobile numbers: auspicious vs. inauspicious) between-subjects factorial design. The purpose of the study was to examine the impact of two manipulated variables (mobile numbers and prices) and one measured variable (perceived price fairness) on a consumer's intention to purchase. The manipulations were contained within a description of mobile telecommunications by a mobile phone provider. Each subject was randomly assigned one of four hypothetical shopping scenarios. Subjects were asked to imagine that they were applying for a mobile phone and wanted to choose a suitable mobile phone number. Mobile numbers and prices were manipulated between subjects within this description. For example, if consumers choose an inauspicious mobile phone number (include "444"), they would receive a monthly reduction of NT \$ 150 for a year. On the other hand, if consumers choose an auspicious mobile phone number (include "888"), they would pay a premium of NT \$ 480. The NT \$ 150 reduction of monthly mobile expenses/NT \$ 480 addition was referred to the Taiwan Mobile Telecommunications. The most effective scenario studies involve situations the respondents have experienced and understand [21]. It will be found, through the experiment, if consumers define the 888 as auspicious numbers; their price unfairness might be reduced if they meet a price premium. Contrarily, if consumers can pay a price premium to exchange an auspicious phone numbers, their perceptions of price fairness may be balanced.

Measures

All the constructs were measured on a 5-point Likert scale ranging from 1 as "Strongly Disagree" to 5 as "Strongly Agree". Items were adopted or adapted slightly from existing survey instruments.

Price fairness

Price fairness items were adopted from [18,23], and price fairness was measured with a set of four items: fair, acceptable, unfair (reverse coding), and satisfactory. Use of four raters and averaging scores resulted in a scale reliability of Cronbach's alpha=0.87.

Purchase intentions

The purchase intention construct was adapted with slight modification from the Kukar-Kinney et al. scale [23] to fit the current context. The three items for the purchase intentions related to the numbers and prices in each scenario were "I would be willing to purchase at the mobile telecommunications store," "It is very likely that I would purchase at the mobile telecommunications store," and "The probability that I would purchase at the mobile telecommunications is very high." The average score of respondents was calculated, and the internal reliability of the scale assessed by Cronbach's alpha was 0.89 for this study.

Demographic characteristics

Subjects reported their age, gender, educational level and income level, and the sample was balanced for these factors. Demographic characteristics of the sample were also assessed in order to control for their possible effects (e.g., age, gender). Realism checks. I assessed a realism check to test whether consumers found the situation realistic. I selected a five-point Likert-type scale (1 = strongly disagree, 5 = strongly

agree) [33] and asked respondents to rate whether (a) the situation described was realistic and (b) they had any difficulty imagining themselves in the situation. The results showed that respondents had no difficulties with realism or with imagining themselves in the given situation, with ratings of M=4.04 and M=4.03 for the two items respectively.

Results

The correlation between variables presented in Table 1 indicates that the two predictor variables in the study were independent of each other, since the correlation between them was insignificant. Therefore, the multiple regression technique used for data analysis may be considered appropriate. The regression results of testing for the effects of number superstitions and prices on perceived price fairness are also in Table 1. To test for a mobile numbers and prices interaction effect (H1), I included a squared term (mobile numbers * prices) and a squared term interaction (price fairness * mobile numbers * prices). In regression analysis, a dummy variable (also known as an indicator) takes the value of 0 or 1 to indicate the absence or presence of some categorical effect that may be expected to shift the outcome. If there is an intercept term included in a regression model and if a K-level categorical variable is to be included in the model, then K-1 dummy variables must be defined to represent this categorical variable [34]. The mobile numbers and prices were "dummy-encoded" and were included as predictors in the model as follows: mobile numbers were coded 1 for auspicious mobile numbers and 0 for inauspicious mobile numbers and prices were coded 1 for a price premium and 0 for a price discount. Equation (1) was applied to test the hypothesis.

$$Y = \beta_0 + \beta_1N + \beta_2P + \beta_3NP + e \quad (1)$$

where *Y* is the perceived price fairness, *N* is the mobile number, *P* is the price, *NP* is the interaction term; and *e* is the error term.

A significant coefficient β_3 supported H1, indicating that the mobile numbers and prices jointly affect consumers' perceptions of price fairness. That is, auspicious mobile numbers with a price premium are positively related to perceived price fairness and, as can be seen in Table 1 ($\beta = 1.03, p < 0.001$), H1 was strongly supported. Similarly, H2, which stated that auspicious mobile numbers with a price premium are positively related to purchase intentions, was fully supported, as shown in Table 1 ($\beta=0.48, p<0.001$). In equation (1), the *R*² value of 0.68 (*F*=224.67, *P*<0.001) and 0.73 (*F*= 278.35, *P* < 0.001) indicated that the overall model was more than satisfactory in explaining the variance in perceived price fairness and purchase intentions.

Independent variable	Coefficient	Dependent variable			
		Perceived price fairness		Purchase intention	
		β	pvalue	β	pvalue
Intercept	β_0	3.156	0.000***	3.417	0.000***
Mobile number	β_1	- 0.218	0.000***	0.454	0.000***
Prices	β_2	-1.037	0.000***	- 0.620	0.000***
Mobile number * price	β_3	1.103	0.000***	0.476	0.000***
F-value		224.669	0.000***	278.354	0.000***
<i>R</i> ²		0.681		0.725	
Adjusted- <i>R</i> ²		0.678		0.723	

* *p* < 0.05; ** *p* < 0.01; *** *p* < 0.001

Table 1: Regression analysis: mobile number and price related to perceived price fairness and purchase intention.

To examine the mediating effects of perceived price fairness between the combination of the mobile numbers and prices and purchase intentions, the equation for regression analysis, shown as equation (2), was used.

$$Y = \beta_0 + \beta_1N + \beta_2P + \beta_3NP + \beta_4F + e, \quad (2)$$

where Y is the purchase intention; N is the mobile number; P is the price; NP is the interaction term; F is the perceived price fairness; and e is the error term.

The results, as shown in Table 2, indicate that coefficient β_4 was significant for predicting consumers' purchase intentions ($\beta=0.48$, $p<0.001$). Perceived price fairness mediates the relationship between auspicious mobile numbers with a price premium and purchase intentions. The F test for the R^2 increment between the reduced model and the full model pointed out the significant effects of perceived price fairness ($R_{reduced}^2 = 0.68$, $R_{full}^2 = 0.73$, $F_{1,315}=36.73$, $P<0.001$). Therefore, the observed level of significance for the value of the R^2 increment was 0.29, supporting H3. The comparison regression results of the reduced model and full model are presented in Table 2, showing that the explanatory power of the model may be considered satisfactory ($R^2 = 0.73$) and indicating that the model fits the data and is appropriate to test the hypothesis. Indeed, with the choice of auspicious mobile numbers with a price premium, consumers will perceive price fairness, which will positively influence their purchase intentions.

This study also examined the superstitious effects on the four groups. As shown in Table 3, when offered auspicious mobile numbers, respondents indicated higher purchase intentions ($M= 4.46$ and $M= 4.30$) than did the other two groups, while those offered inauspicious numbers show lower purchase intentions ($M=3.42$ and $M=1.99$) than did the other two groups. This suggests that the superstitious phenomenon was significant in this study as there were low purchase

intentions for inauspicious mobile numbers while most respondents perceived that inauspicious mobile numbers with a price discount was fair ($M=3.16$).

Discussion and Implications

On a theoretical level, these results have important implications for those wishing to understand how people's superstitions influence their perceptions and decisions in the purchase process. Our findings can be summarized as follows.

First, the current research is the first to investigate the effects of number superstitions and prices on consumers' perceptions of the fairness of mobile telecommunications policies. The significant interactions found in the study underscore the importance of expanding this theoretical understanding to quantify the effect of number superstitions on prices. Data analysis highlights theoretical explanations of the rationality of superstition that cause consumers to be willing to pay to support their psychological anomalies [35]. Thus, this study contributes to the field of purchase intention studies by demonstrating that consumers may consider the combination of auspicious numbers and prices in making a decision for choosing a mobile number.

Second, the findings further support the effect of number superstitions in purchase intentions or decisions. Because people's superstitious concepts result in number myth, they will avoid "bad" numbers. In this thinking, just as everyone has a different energy, which is not necessarily good or bad and is relative to other energies, so do numbers. In the Chinese language, there are many puns or words with double meanings that are used as symbols to induce certain emotions or certain ways of thinking. When the number "4" is spoken in Chinese-si-it sounds like the word for "death". Thus, the number "4" is often considered unlucky. Because enough people believe that the number "4" or "13" is negative, seeing it activates pessimism, a self-defeating act that is often the cause of problems. Interestingly enough, "13" (1 + 3) adds up to be "4" as well, and is considered by westerners to be an unlucky number. Thus, superstitious consumers will be inclined to give up inauspicious mobile numbers. Finally, this study provides support for previous research on the relationships between perceived price fairness and purchase intentions. This finding is consistent with Kukar-Kinney, Xia and Monro [23], who suggested that perceptions of price policy influenced consumers' purchase intentions indirectly through perceived price fairness, while perceptions of price fairness influenced consumers' purchase intentions directly. This study also has important managerial implications. The first suggestion is to take superstitions into account when developing prices in order to affect consumers' perceptions of fairness and their purchase intentions. While some people may perceive a price premium for an auspicious mobile number to be fair, others may be uncomfortable with the price premium policy. The mobile telecommunications industry should be circumspect and realize that some customers may be dissatisfied with the price premium policy connected with choosing a preferred mobile number.

Although the impact of a price premium for specific mobile numbers on purchase intentions was significant, the mobile telecommunications industry must evaluate the range of a price premium to ensure customer acceptance. This proposition is in agreement with Herrmann et al. [36], who suggested that consumers have a right to understand the procedure for setting the price and terms in order to make a judgment about the price offered. In addition, people may have higher degree of superstition toward bad luck than good luck because no one wants

Independent variable	Coefficient	Purchase intention			
		Reduced model		Full model	
		β	pvalue	β	pvalue
Intercept	β_0	3.417	0.000***	2.236	0.000***
Mobile numbers	β_1	0.454	0.000***	-0.309	0.000***
Prices	β_2	-0.620	0.000***	0.519	0.000***
Mobile number * price	β_3	0.476	0.000***	0.172	0.014*
Perceived price fairness	β_4			0.300	0.000***
F-value		278.354	.000***	241.549	0.000***
R^2			0.725		0.754
Adjusted- R^2			0.723		0.751

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 2: Results of regression analysis examining the influence of perceived price fairness related on purchase intention (comparison between the reduced model vs. the full model).

	Group 1 (n=80)	Group 2 (n=80)	Group 3 (n=80)	Group 4 (n=80)
	Auspicious mobile numbers	Inauspicious mobile number	Auspicious mobile numbers	Inauspicious mobile number
	Price discount	Price discount	Price premium	Price premium
Perceived price fairness	2.753	3.156	2.997	1.241
Purchase intentions	4.462	3.417	4.300	1.988

Note: Superscripts within a row that are different indicate mean significantly different from group at $p < 0.05$; $p < 0.01$; $p < 0.001$.

Table 3: Mean results by condition.

to court bad luck actively [37]. Our findings showed that consumers may think inauspicious mobile numbers with a price discount are fair, but they still have low purchase intentions for them. This study contributes to a combination of concepts of superstition and past literature, suggesting that the mobile telecommunications industry can apply some customers' superstitious concerns to let them accept a price premium toward an auspicious mobile numbers. On the contrary, marketers also can promote inauspicious mobile numbers to capture non-superstitious customers such as student groups or adopt a bundling effects pricing strategy [38] for a special offer of a mobile phone (e.g., deduction of call charges) with an inauspicious mobile number.

Limitations and Future Research

This study reveals a need for future research in multiple directions. First, with regard to superstitious beliefs, different taboos have their own meaning in different cultures. Our results have confirmed the significant effects of the number superstitions; future research can compare the effects in different countries with different superstitions.

Second, there is clearly a need for understanding the combination of management and myth, so future research should examine the effects of other kinds of intangible effects, such as how colors affect consumers' reactions or purchase intentions [39], like Chinese women tend to choose a red dress rather than a white dress when they marry because red is the color of love and luck.

Finally, the limitations of this research include the fact that this study employed hypothetical scenarios instead of real situations the respondents encountered. Future studies can extend to actual experiences.

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