A Study on the Psychological Mechanism of Numerosity Effect Affecting Consumption Behavior

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Abstract

The hypothesis of rational man in economics determines that individual cognition and requirement for the same thing will not change with the way things are represented and the way individual information is processed. At the same time, the aim of the consumer is to maximize the economic utility with the lowest cost, so as to maximize the benefits. However, scholars in the field of consumer behavior have put forward the opposite view in this regard. Some scholars point out that when individuals interpret the quantitative attribute of stimuli, they will not only deviate from the judgment of the same number expressed by different numbers and units, but also be affected by digital initiation, produce different needs for the same commodity represented by different numbers, and even make decisions that violate the maximization of economic utility, which is the digital effect. Different psychological mechanisms explain the irrational behavior of consumers caused by digital effect. In addition, these mechanisms also look forward to the future research direction of numerosity effect in the field of consumer behavior.

Keywords

Digital Effect; Psychological Mechanism; The irrational; Consumption behavior.

1. Introduction

There is a quantitative representation system in individual memory, which can quantitatively encode, store and invoke the attribute information of almost all stimuli (Adaval, 2013). Thus, the number is one of the external cues followed by individuals in making decisions. For example, an individual will determine the size of a house by the number of rooms it owns (Pelham, Sumarta, & Myaskovsky, 1994), and believe that a house with eight rooms is more likely to have a larger size than a house with four rooms.

Almost every day, consumers face a variety of digital decisions, such as how many biscuits to eat, how many bottles of juice to buy, whether the price tag is reasonable, as well as how many days it takes to send parcel to a designated place and so on. These digital decisions are all based on the basic assumption that individuals are rational and they have the ability to distinguish whether the numbers contained in different stimuli are different. However, consumer behavior scholars have put forward the opposite proposition in this regard. They point out that when individuals interpret quantitative stimuli attributes by using language and brain representation systems, they not only misjudge the same number of different representations, but also be affected by digital initiation, produce different needs for the same commodity represented by different numbers, and even make decisions that violate the maximization of economic utility, which is the "digital effect" (Numerosity Effect; Adaval, 2013). In other words, numbers can lead to irrational behavior of individuals (Tversky & Kahneman, 1974).

From the perspective of irrational cognitive deviation caused by digital effect, this paper first summarizes the scholars' correlational research on the violation of the principle of economic rational man invariance and the economic utility-maximizing rule. Then, based on the theories of limited memory capacity, easy access to information extraction, information processing

fluency and so on, this paper summarizes the psychological mechanism of the influence of figures on consumer behavior. Finally, this paper discusses the future research direction of numerosity effect in the field of consumer behavior as well.

2. The Influence of Numerosity Effect on Consumer Behavior

The influence of digital effects on consumer behavior is contrary to two principles of the rational man hypothesis in economics. The first one is the principle of invariance. Economists point out that by weighing the attributes of alternatives within the selection set, individuals are able to sort alternatives and choose the options with the highest preferences. Since the base of the ranking is the trade-off of the commodity's attributes, it will not affect the ranking result in both the representation mode and the individual information processing mode, that is, the "invariance principle"(Mas-Colell, Whinston, & Green, 1995). However, scholars in the field of consumer behavior have found that both the representation of numbers in commodity attributes and the changes in the way individuals process information caused by numbers, which will lead to changes in consumer decision-making behavior (Mas-Colell et al., 1995). The second one is the economic utility-maximizing rule. Rational man pursues the maximization of economic utility, that is, to obtain the highest income by using the lowest cost. Pareto Optimality theory points out that an individual will eventually reach a state, at which point his utility will not become better by changing the outcome of the decision (Mas-Colell et al., 1995). However, the study of scholars in the field of consumer behavior has once again questioned the hypothesis. Discovered by scholars in the field of consumer behavior, the decision-making behavior of consumers will no longer follow the economic utility-maximizing model due to the existence of the digital effect.

2.1. The Violation of Numerosity Effect to "The Principle of Invariance" of Rational Man in Economics

2.1.1. The Influence of Different Representations of the Same Number on Consumer Behavior

The behavior of consumers can be significantly affected by different representations of the same number, that is, consumer preferences will change with digital representation. Therefore, this phenomenon violates the principle of invariance of rational man in economics. According to the research background of digital effect, scholars put forward "face value effect", "granularity effect", "unitosity effect" and "weights and measures effect". Although the situation is different, it is essentially the irrational behavior of consumers caused by the change of digital representation. Such as perceived price deviation, commodity value and quality judgment deviation, as well as perceived target achievement progress deviation and so on.

Firstly, when pricing involves currency units, representation of the use of different currency units will trigger a perceived price deviation. According to the change in the size of a number caused by the change of unit size of quantitative representation, scholars propose face value effect (Face Value Effect; Raghubir & Srivastava, 2002). They point out that when consumers travel to weak currency countries, they spend less than in countries that have a strong currency. For example, $20 is equivalent to about 247 Mexican dollars, so when American consumers travel to Mexico, they feel that the same goods are sold more expensive in Mexico, thereby reducing consumption. $20, on the other hand, is equivalent to about 13 euros, so when American consumers travel to EU member states, they feel that the same goods are sold cheaper in Europe, thus boosting consumption. However, the face value effect no longer exists when the individual is aware that the Weights and measures can be converted to each other (Raghubir & Srivastava, 2002). However, when individuals realize that, for example, when American tourists visit in Mexico or Europe, they consciously convert the price of goods into their own currencies

at exchange rates, there is no significant difference in their consumption levels among the three countries. When it can be converted to each other, the face value effect no longer exists.

Secondly, when businesses use numbers with different accuracy to describe the attributes of commodity, it will affect the judgment of consumers on the value of commodity as well. The same numbers can be represented by different accuracy, for example, in the three representations of "1 year", "12 months" and "365 days", the accuracy increases with the increase of the number. According to this, Zhang and Schwarz (2012) proposed "granularity effect" (Granularity Effect). The granularity effect points out that when businesses use more accurate numbers to estimate delivery time and warranty duration, consumers will feel that businesses are more confident in their products and services. Therefore, consumers are more likely to think that the merchant's estimates are accurate, so as to choose the merchant's products or services. Similarly, the unit representation will also have an impact on the quality judgment of consumers. Existing studies have shown that consumers can predict the extent of numerical change by the size of the representation unit. That is, when the consumer's attention is transferred from the digital to the unit, it is perceived that the number of changes represented by large units varies even more, which is the unitosity effect (Unitosity Effect; Monga & Bagchi, 2012). For example, courier companies can promise delivery dates of 7 to 21 days (large numbers, small units), or 1 to 3 weeks (small numbers, large units). When the consumer is more concerned with the unit (day vs week), it is perceived that the delivery time is delayed by 0.5 weeks or more intolerable than a delay of 3 days. On the contrary, when the consumer is more concerned with the number (7-21 vs 1-3), it is perceived delivery time is delayed by 3 days is more intolerable than the delay of 0.5 weeks. The unitosity effect is produced because there are differences in the level of individual construction of consumers. The theory of construction level points out that there are two different levels of high and low of individual judgment on the representation of things. In which the individual of the high construction level is abstract and structured to the judgment of the representation of the things, but the individual of the low construction level is specific to the judgment of the representation of the things, but not structured (Trope & Liberman, 2010). On the basis of this theory, the scholars further point out that the high-construction level individuals tend to pay attention to the abstract "unit", while the lower-construction level individuals are more likely to pay attention to the specific "number" (Monga & Bagchi, 2012). Therefore, when the consumer is concerned with the number (in the context of a low level of construction), they will think that the smaller the unit, the greater the perceived change in commodity attributes. When consumers pay attention to the unit (in the context of a high level of construction), they will present the unitosity effect, that is, the larger the unit, the greater the perceived change in commodity attributes. Finally, different representations of the same number affect the consumer's perception of the progress of the target. Bagchi and Li (2011) set up different combinations of weights and measures and step sizes to test the impact of consumers on goal pursuit when studying the marketing mode of "printing" to maintain consumer loyalty in the project. For example, "accumulate 10 points per expense and give a cup of coffee free of charge at 100 points (10/100)." In addition, "accumulate 1 point per expense and give a cup of coffee free of charge at 10 points (1/10)." Although it both achieves 10 percent of the target for each consumption, Bagchi and Li (2011) found that there is a significant difference in the effect of the two statements. Weights and measures and step size together affect consumers' perception of the degree of achievement of the goal and the motivation of the pursuit of the goal. Which indicator of weights and measures t and step size has a greater impact depends on the focus point of the consumer. Concretely speaking, in situations where the step size information is vague, consumers largely infer the target progress only from weights and measures (100 vs. 10). The larger the weights and measures (100), the greater consumer perceived the gap in points between their own and other consumers. In situations where the step size information is clear, the consumer will turn to the

step size (10 vs. 1) information to determine the target progress. The larger the step size (10), the greater consumer perceived the gap in points between their own and other consumers. The greater consumer perceived the gap, the stronger the motivation to repeat purchases and achieve exchange goals.

Not only the consumption goal, but also the form of digital presentation has an impact on the daily goal pursuit of consumers. Absolute difference and relative difference affect the individual's judgment of numerical value together, and the impact of relative differences tends to be greater than absolute differences (Palmeira, 2011). For the same attribute value difference, compared with the representation of small weights and measures, the representation of large weights and measures makes the individual perception of the difference more greatly (Pandelaere, Briers, & Lembregts, 2011). Therefore, businesses can guide consumers to choose healthier products by using presentation mode of nutrients on food labels. Concretely speaking, there are two forms of food calories: kilojoules and calories (1000 kilojoules ≈ 240calories). When the merchant uses the "kilojoules" to mark the calorie contained in the food, consumers tend to perceive that junk food has higher calories, thus choosing healthy food with lower calories. Because the choice of healthy food can reduce calorie intake for consumers who are controlling their weight, the digital presentation of food nutrient content can affect the achievement of consumers' daily goals to a certain extent.

2.1.2. The Effect of Different Digital Initiation of the Same Commodity on Consumer Behavior

The principle of invariance in economics assumes that consumers have a stable preference that does not change with the situation. According to the principle of invariance, different promotion methods will not have an impact on consumer demand. Since consumers themselves have plans for commodity demand, they will not change the quantity of purchases. However, the research of the consumer behavior field shows that different digital representations of the same commodity will initiate the quantity judgment information in the consumer's cognition, thus affecting the subsequent purchase behavior. Under this situation, consumers' cognition of quantity violates the principle of invariance of rational man in economics. Concretely speaking, commodity attribute numbers will initiate consumers' perception degree of quantity, metaphorical association of related concepts, and different information processing methods, and affect subsequent consumer behavior through spillover effects. The consumers' perception degree of quantity enables consumer decision-making no longer based solely on the trade-off of commodity attributes, but more dependent on the situation.

Firstly, in the field of consumer behavior, scholars find that numbers can initiate consumers' perception of quantity. Its research field mainly focuses on inventory estimation (Chandon & Wansink, 2006), purchase quantity prediction (Wansink, Kent, & Hoch, 1998) and commodity content judgment (Madzharov & Block, 2010; Raghubir & Krishna, 1999). First of all, the initiation of the number of goods will affect consumers' inventory estimates. Chandon and Wansink (2006) found that consumers tend to use the average inventory of daily household goods as a reference to adjust their inventory for each commodity. However, due to the existence of reference quantities, consumers are not able to estimate the inventory of each commodity in the home fully and accurately. As a result, a portion of the daily necessities are piled up and the other part of the daily necessities is short. Second, quantity initiation will affect the quantity of consumers' purchases. Wansink et al. (1998) found that supermarkets can significantly increase sales by using the promotion mode of "recommended consumption". For example, use the promotional phrase "buy 18 ice bags for your wine" is better than the promotion of "buy 6 ice bags for your wine", and 18 ice bags are more likely to stimulate consumers' perception of larger numbers and significantly increase the amount of wine they buy. Finally, Madzharov and Block (2010) through a series of experiments found that the number of biscuits on the outer package of biscuits can significantly influence the consumer's

estimation of the content of the biscuit in the bag and the real purchase behavior. Specifically speaking, consumers think that the number of internal biscuits of the product with 15 biscuits on the packing bag is more than the product with three biscuits on the packing bag, although both indicate a content of 100g. Scholars have also further discussed the boundary conditions in which the perceived deviation of this quantity plays a role. Visual processing ability refers to the ability of individuals to process the picture information and correctly understand its meaning. Scholars have found that the stronger the visual processing ability of consumers, the more likely they are to think that the more biscuits are printed on the bags, the more biscuits are in the bags (Madzharov & Block, 2010). Secondly, numbers will initiate consumers' metaphorical associations of different concepts. Metaphor refers to the process in which the existence of one thing can stimulate an individual's association with another thing associated with it (Lakoff, 1987). Metaphorical association can significantly affect individual behavior (Zaltman & Coulter, 1995). For example, Stiving and Winer (1997) found that consumers tend to associate high quality with the number 0 and low quality by the number 9. Consumers will think that the product whose the price ending with the number 0 has higher quality, while the product whose the price ending with the number 9 is of lower quality (Stiving & Winer, 1997). This finding is contrary to the strategy of using the number 9 as the end number of the price found in the previous research and practice. Because goods priced at the end of the number 9 represent more discounts and lower quality commodity positioning. Based on the above theoretical research, it is found that businesses can price goods according to the brand image they want to convey to consumers. For example, high-end brands and brands known for their high quality should set the end number of commodity prices to 0, while economic brands such as discount supermarkets should set the end number of commodity prices to 9.

Scholars have found that digital accuracy can also initiate consumers' metaphorical association of different concepts. The accuracy of a number is defined by the number of numbers at the end of the number 0. A number that ends with 0 is called an integer, and a number that ends with a non-0 is called a precise number. Scholars have found that accurate numbers, for example, 19.41% compared to 20%, are more likely to associate consumers with trustworthiness (Schindler & Yalch, 2006), accuracy (Zhang & Schwarz, 2012), confidence (Jerez-Fernandez, Angulo, & Oppenheimer, 2014) and ability (Xie & Kronrod, 2012) than integers. And integers can remind consumers of stability (Pena-Marin & Bhargave, 2016). For example, pena-marin and bhargave (2016) found that when commodity attributes are represented by integers, consumers perceive that goods can bring longer-term benefits. Caffeine drinks, for example, provide energy to individuals, but caffeine, the main ingredient that provides energy in drinks, decreases over time. The merchant can use the integer (200mg) to label the caffeine content in the beverage, because the integer allows the consumer to feel that the beverage is functioning longer the precise number (203mg). Based on the above theoretical research, it is found that businesses can develop different marketing communication strategies according to the positioning of their own products and services (for example, competent vs. durable). For example, because precise numbers are more representative of science and mathematics than integers, businesses can use precise numbers to describe product characteristics or price products in high-tech product marketing, which in turn increases consumers' perception of the "science and technology outstanding point" of products.

In addition, scholars further point out that there is a gender difference in the figures. Integers are more feminine, while precise numbers are more masculine (Yan, 2016). From the perspective of metaphorical association, compared with integers, precise numbers can initiate consumer concepts related to confidence (Jerez-Fernandez et al., 2014) and aggression (Backus, Blake, & Tadelis, 2015). The normal theory of gender (Lay Theories) points out that confidence and aggression represent male traits (Bem & Steven, 1975; Lawless, 2004), while flexibility and inclusiveness are typical female traits (Dehaene, Bossini, & Giraux, 1993). The concept of

precise numbers initiation is consistent with male characteristics, and as a result, the figures are gender-specific.

Thirdly, numbers can initiate different information processing methods of consumers. As one of the contextual factors, numbers will have an impact on the individual information processing methods. The scholars have found that digital accuracy can initiate different information processing methods of consumers. King and Janiszewski (2011) found that people deal with integers more fluently than precise numbers. Furthermore, the study of Wadhwa and Zhang (2015) shown that integers make consumers more inclined to rely on sensory processing information, while accurate numbers make consumers more inclined to use cognitive analysis to process information. Therefore, when consumers are in the situation of relying on sensory to process information, the integer representation of commodity attributes can enhance the positive attitude of consumers towards the commodity. When consumers are in the situation of relying on cognitive processing information, the precise number representation of commodity attributes can significantly enhance the positive attitude of consumers towards the commodity. This finding is also applicable to the field of brand image positioning. On the one hand, women are more likely to rely on sensory to process information, while men are more likely to use cognition to process information (Spence, Helmreich, & Holahan, 1979). This finding matches the integer (vs. the precise number) initiate consumer with sensory processing information (vs. cognition). On the other hand, Lawless (2004) found that as the difficulty of information processing increases, consumers will feel the greater the challenge of the task. As a result, it triggers a more masculine mode of thinking to solve difficulties, and it matches with more difficult precise numbers (vs. Integer) of customers. Therefore, when the brand image is masculine (vs. feminization), the precise numbers (vs. Integer) to represent commodity attributes can improve consumer evaluation of the brand.

2.2. The Violation of Numerosity Effect to the Principle of Maximizing Utility of Rational Man in Economics

Economics suggests that rational consumers will weigh costs and benefits, and then make the optimal decision to maximize benefits at the lowest cost. However, due to the existence of digital effect, consumers are often unable to make rational judgment, that is, to make decisions that violate the economic utility-maximizing rule.

First of all, businesses often use 9 as the end number of commodity price in pricing, which leads to excessive representation, and then a series of digital effects (Stiving & Winer, 1997). For example, Stiving and Winer (1997) used sales data of tuna and yoghurt in the supermarket to empirically analyze the impact of the price end number 9 being overrepresented on the perceived deviation of consumer commodity prices. In other words, the perceived price is lower than the actual price. For example, consumers will think that $2.99 is much lower than $3.00. Because consumers tend to contract downward, remember only the integer $2 on the left. Thus, the cup price of $2.99 and $2.91 is a little more than $2 for consumers. Therefore, businesses price goods as the price ending in 9, which can seize the maximum profit without affecting the perception of consumer price.

Secondly, the deviation of perceived price is caused by the precise digital representation of the merchant at the time of pricing. Thomas, Simon and Kadiyai (2010), for example, using the U. S. real estate market as a source of data, and the study found that consumers would underestimate the real prices of houses priced with precise prices. They named the phenomenon as price precision effect. In a series of laboratory experiments, they found that consumers mistakenly believe that $395425 is cheaper than $395000. Especially when the consumer perception uncertainty is high, this kind of price judgment deviation is more significant. In addition, consumers will think that the reason why real estate developers use accurate number pricing is an accurate cost valuation, so the willingness to negotiate prices is even lower. When scholars

applies this finding to the US real estate market, they find that when the house is priced at an precise number ($364578) rather than a similar integer ($365000), the former have a higher transaction price.

3. The Mechanism of the Effect of Numerosity Effect on the Consumer Behavior

Through the review of the above literature, we find that the numerosity effect will lead to the irrational behavior of consumers, which violates the principle of invariance and utility-maximizing rule of rational man in economics. The specific performance is that consumers will show different preferences for the same thing represented by different representations, will be initiated by numbers in different concepts, metaphorical associations and information processing methods, and will also make sub-optimal decisions that do not satisfy the maximum utility. Throughout these studies, we find that the limitation of the memory capacity, the availability of information extraction and the fluency of information processing play an important role in the psychological mechanism of digital effect.

3.1. The Limitation of the Memory Capacity

The first kind of explanation mechanism of numerosity effect originates from the theoretical study of memory. Individual recognition and memory of price figures form the following two tendencies. First, since the individual's memory capacity is limited, it is difficult for them to recall the figures that have been seen before (Brenner & Brenner, 1982). The limited memory capacity of an individual makes it possible to develop two types to deal with numbers, rounded and truncated, respectively. The consumer is not used to representing a large number with a precise number, and a larger number is often rounded or truncated to tens, hundreds, or even thousands of bits to facilitate memory. Therefore, when consumers see a larger precise number compared with integers (for example, $364578), they do not have a very accurate concept of the size of the precise number (Thomas et al., 2010), thus generating the cognitive deviation caused by the precise number described earlier.

Second, when the relative size of the two numbers is compared, the individual compares the two numbers bit by bit from left to right (Hinrichs, Berie, & Mosell, 1982; Stiving & Winer, 1997). For example, in the case that given the following two sets of prices, $0.89 and $0.75(Group 1), $0.93 and $0.79(Group 2), most consumers will feel that $0.79 in the second group is a more cost-effective transaction. However, in fact, the price difference between the two groups is $0.14, what's more, the overall price of the first group is lower. The reason for this cognitive deviation is that consumers compare the pricing with a bit-by-bit comparison from left to right. The left-most number difference is 1 (that is, 8−7=1) in the first group of prices, while the left-most number difference is 2 (that is, 9−7=2) in the second group of prices, so when the left-most number is compared, the consumer perceives that the $0.79 in the second group is a more cost-effective price. Furthermore, Thomas and Morwitz (2005) summed up the previous research results on the "analog model" of digital cognition (Adaval & Monroe, 2002; Dehaene, Dupoux, & Mehler, 1990; Hinrichs, Yurko, & Hu, 1981; Monroe & Lee, 1999). They point out that when individuals compare two numbers, they are mapped the quantitative representation system within the brain at the same time. If the left-most numbers of the two numbers are the same, then the distance after representation will be very close. The individual's perception is not enough to be sensitive to the subtle difference, so the price advantage that ends with the number 9 will no longer exist and the phenomenon is named as "the left-most digit effect".

3.2. The Availability of Information Extraction

The second kind of explanation mechanism of numerosity effect originates from the perspective of cognitive theory. From the perspective of evolution affecting individual cognition, the

scholars theoretically explained the reason that the high frequency of the digital 0 and the digital 5 appeared at the end of the digit, that is, the availability. Specifically speaking, the ease to which a unit can be extracted from the memory, defined as availability (Tversky & Kahneman, 1973) or accessibility (Fazio, Chen, McDonel, & Sherman, 1982; Higgins, Rholes, & Jones, 1977). Before humans invent complex arithmetic systems, they need to rely on other tools to count. Since the human has one hand, it can be counted from 1 to 5, and then to 10, and the convenient counting mode is always used, leading to higher cognitive availability of the individual to the digital 5 and the digital 10. When the individual processes the digital information, the number is removed from precision in order to reduce the cognitive effort. In other words, the nearest, more accessible number is used to replace it (Kaufman, Lord, Reese, & Volkmann, 1949). Therefore, the probability that the number 5 and the number 0 appear at the end of the digital representation is greater (Schindler & Kirby, 1997). Baird, Lewis and Romer (1970) further found that the number ending with the number 0 was overrepresented to a higher extent than the number ending with the number 5, indicating that he digital availability at the end of the number 0 is higher. It echoes the "top-ten effect" (Top-Ten Effect; Isaac & Schindler, 2014) in real life, for example, "the peak of perfection" is used to express a very perfect and impenetrable state, or to select "top ten teachers", "top ten youths" and so on.

3.3. The Fluency of Information Processing

The third kind of explanation mechanism for numerosity effect is derived from the information processing theory perspective. Decision making theory (Decision Making Theory; Bettman, Luce, & Payne, 1998) pointed out that when an individual makes a decision, he or she will make a trade-off between finding the optimal result and spending the least cognitive effort. In the processing of information related to the number for an individual, the application of information processing fluency is embodied in many ways. For example, the default unit is the optimal solution between the optimal result and the minimum cognitive effort of the human being under the natural selection. The default unit refers to the most common unit for a certain attribute that is generally accepted in the cultural context. For example, the unit that describes human body weight is a "kg" rather than a "ton", describes 365 days a year instead of 31536000 seconds. Using the default unit can improve the fluency of individual processing information (Schwarz, 2004).

4. Prospect of Future Research

Taking thought of questioning the hypothesis of rational man in economics by numerosity effect as the main line, and this study probes into the violation of the invariance principle and the utility-maximizing rule of the rational man hypothesis in economics by the digital effect. Future research can continue to explore how digital effects promote consumers to make irrational decisions and their psychological mechanisms. Specifically, the discussion of how the numerosity effect violates the hypothesis of rational man in economics can be carried out from the following five aspects:

First, the impact of digital representation form on consumer behavior. In addition to the size of the number itself, the representation form of the number may also affect consumer behavior. Scholars have found that the effect of the percentage discount many times in a row is better than that of single discount (Chen & Rao, 2007). However, most of the previous studies focused on the influence of Arabic numerals on individual cognition, information processing mode and behavior. Therefore, future research can focus on the influence of different digital representation form, such as percentage form and Chinese character form, on consumer behavior and its psychological mechanism. For example, when represented by the Arabic numeral "2", the individual not only visually perceives the existence of the digital form (see the number "2"), but also understands the quantitative meaning of the number from a cognitive

point of view (the meaning of the number "2" stands for). Future research can focus on the influence of Chinese characters on individual perception when the same number is represented by Chinese character "two".

Second, the impact of the position of numbers on consumer behavior, existing studies shows that individuals tend to think that the number on the right is larger than the number on the left. This is because individuals, based on the acquired habit of drawing the "x axis", think that the more it goes to the right, the bigger the numbers (Cai, Shen, & Hui, 2012). Therefore, when consumers make product choices in supermarkets, it appears the situation without looking at the price that they will think that what is placed on the right side of the shelf is more expensive than the one on the left. So, according to the human habit of drawing the "y axis", does the more upward the number, the bigger the individual thinks, and then will the consumer think that the goods above the supermarket shelf are more expensive? Future research can explore how the upper and lower positions of numbers affect consumer behavior and its psychological mechanism.

Third, the impact of odd and even numbers on consumer behavior, and scholars have discussed the different categories of numbers, such as the different roles of exact numbers and integers in consumer behavior. But few studies have explored whether other forms of numerical classification, odd and even, can have different effects on consumers' cognition and behavior. Although there is no direct empirical study result to confirm the different effects of odd and even numbers on individuals, but some indirect findings, such as naming methods, provide a theoretical basis for this study. Lambert (1975) names integer pricing "even pricing". And Nijs, Srinivasan and Pauwels (2007) further named the rest of the non-integer pricing "odd pricing". Such naming implies possible similarities between integers and even, exact, and odd numbers. In recent years, scholars have carried out relevant research. For example, Wilkie and Bodenhausen (2015) found that odd numbers are more closely connected to masculinity, and even numbers are more closely connected to femininity in individual cognition. Combined with the conclusion that the exact number is more masculine than the integer in the above review, the future research can focus on whether the conclusion applicable to integers/exact numbers is also applicable to the study of odd and even numbers. For example, it can be explored that when using odd numbers (vs. even numbers) whether an individual is more dependent on cognition (vs. pricing emotional) for decision-making?

Fourth, the impact of pricing ending with different numbers on consumer decision-making model, and consumers often face two situations: integration comparison and separation comparison when making a product selection. When integrating comparisons, consumers can choose options within the set to act as references to each other, so it is easier to compare attributes. At this point, it is easier for individuals to judge by the internal trade-offs between attributes. so, what kind of change will happen to the impact of a commodity ending in a number, such as 9, on consumer behavior? Will its advantage be reduced or even gone? On the contrary, when consumers carry out separation comparison for products, there is no obvious reference to the options in the selection set, so the comparison between attributes is difficult. At this point, it is easier for individuals to judge by external sources of information. For example, the price of a commodity ending at a certain number, in the same way, taking 9 as an example, the future study can explore whether the influence on individual decision-making will be greater in the situation of separation (vs. integration).

Fifth, the impact of figures on the formulation and implementation of individual goals, Labroo and Kim (2009) pointed out that cognitive non-fluency may lead individuals to find that doing a difficult thing will get more useful results in the process of goal pursuit. Because exact numbers will make individuals feel that the processing is less smooth, so in the process of goal pursuit, exact numbers more can stimulate the motivation of individuals to achieve their goals. For example, during fitness, fitness coaches set a one-month weight loss of 9.8kg for customers,

which may be better than promising a one-month weight loss of 10kg. Future studies can further explore how exact numbers promote the formulation and completion of consumer goals by reducing cognitive fluency, and the results of the study are conducive to improving the personal welfare of consumers.

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