

Research on the Impact of Valuation by Feeling and Calculation on Pro-social Behavior of Consumers Based on Field Experiments

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Abstract—Previous studies have found that valuation by feeling and calculation have an impact on prosocial consumer behavior, however they only focus on the impact of positive emotional value, meanwhile they rarely use field experiments to carry out the empirical analysis. This paper explores the effects of valuation by fear feeling and by calculation on prosocial behavior by field experiments. The first experiment found that, based on the value of fear emotion, the prosocial behavior of consumers was reduced by arousing fear emotion, compared with the valuation by calculation. In experiment 2, the income factors of consumers were introduced to explore the different purchasing behaviors of different income groups based on valuation by calculation and by feeling. In low income, the value of fear emotion reduces the prosocial behavior of consumers relative to the valuation by calculation; in high income, the value of fear emotion increases the prosocial behavior of consumers compared to the valuation by calculation. In the end, this paper puts forward marketing suggestions for different experimental effects, and this will help the relevant companies in practice.

Keywords—Valuation by feeling; Valuation by calculation; Prosocial behavior; Field experiments

I. INTRODUCTION

General psychological characteristics of consumers can be divided into the rational consumption psychology and perceptual consumption psychology. One of the usual assumptions in economics is the assumption of rational man (which is also called as economic man). It is easier for people to realize the maximum utility under rational status, so people are mostly under rational governance. However, people are based on the society, and representatives of perceptual psychology include "group psychology" and "vanity". Rational psychology and perceptual psychology can be summarized as two psychological processes of consumers, so we can extend two psychological values of consumers when purchasing—computing value and emotional value. We can easily find out in previous researches that, consumers have different sensitivities of scope under the condition that computing value and emotional value exerts a leading role respectively. Besides, as can be seen from the expressive form of the value function, when consumers are governed by feelings, value is almost a step function of scope, but when computing occupies a leading position, value is close to a linear function [1]. We cannot accurately judge whether consumers are based on feelings or computing when purchasing, and different consumers have different psychological values. For example: An individual can get

RMB 10 incomes/h for 8h/day. If we increase the work incomes of this individual to RMB 20/h, is it certain that this individual will choose to extend its working hours? The answer is uncertain, and depends on the algebraic sum of income effect and substitution effect for each individual, and intuitively, it depends on the subjective value of the individual. Therefore, we cannot predict the influence of computing value and emotional value on an individual's behavior, but we can record their consumption behaviors and then summarize the rules by guiding consumers to think rationally or emotionally.

Field experiment method is adopted in the paper to study the influence of computing value and emotional value on pro-social behaviors of consumers. Firstly, it is based on the emotional value of fear, then arouses fear emotions relative to computing value, and decreases pro-social behaviors of consumers. Secondly, under low incomes, the emotional value of fear can decrease pro-social behaviors of consumers relative to computing value; Under high incomes, the emotional value of fear can increase pro-social behaviors of consumers relative to computing value; Research results of the paper have two theoretical contributions. Firstly, this paper starts from the emotional value of fear, studies the influence of computing and emotional value on consumers' purchasing behaviors in public welfare marketing, and enriches the study of value evaluation in pro-social behavior fields. Secondly, this paper defines the regulating effect of boundary conditions about the influence of computing value and emotional value on consumption choices, i.e., incomes. This paper compares the differences in consumers' behaviors under the guidance of different values and provide some practical suggestions for corporate public welfare marketing through studying on the computing value and emotional value of psychological values.

II. LITERATURE REVIEW AND RESEARCH HYPOTHESIS

Literature review is carried out from three aspects below by focusing on research contents of the paper:

A. Computing Value and Emotional Value

As for consumers, scholars put forward two thinking modes: Rational consumers are based on rules, with strong logic capacity, and are more sensitive to scope figures; However, emotional oriented consumers are associative based on emotions. Therefore, we can extend the value process for consumers to evaluate specific target based on the study: Computing value and emotional value. Computing value should consider the scope, which is quantitative, while

emotional values depend on stimulation features, rather than the scope, which is qualitative. Consumers will compare in the decision-making process, have the psychological process to classify, record and evaluate products or services, and the decisions will depend on the emotional or computing preferences of consumers [2].

Computing value refers to a clear plan for consumption visions, and can obviously increase subjective initiative of consumption under the stimulation of scope and quantity. Emotional value includes the emotional value of decision-making motives, the emotional value of brand attitude, the emotional value of product functions and the emotional value of product service [3]. The perceptual process of consumers is actually the balance between vested interests and the price paid for it. Whether it is out of computing or emotions, values can be reflected when consumers feel that they have more to gain than lose. During the period, values include interest demands and emotional demands, and when products can meet dual demands of consumers, they will form emotional resonance, and generate higher evaluation about the product[4].

Consumers have diversified purchasing motives, which can be approximately divided into two types. Rational consumers pay more attention to the applicability, economists, reliability, safety, etc., while perceptual consumption groups pay attention to emotional experience, for instance, touching consumers' reminiscence, joy and sorrow, love and hatred, and other psychologies. Consumer psychology should be seized to formulate corporate strategy layouts and marketing strategies. Besides, it is requested to select target group and market, make specific innovation, keep customers, and exploit the market. Wherein, emotional value plays an important role in consumption experience, and as the consumption concept changes, consumers' focus is changed from functional value to whether it can bring wonderful consumption experience. Mechanism to form emotional value should include three layers, i.e., self-satisfaction (experiential consumption), self-realization (functional consumption) and self-enrichment (symbolic consumption), and can stimulate consumers' purchasing behaviors through touching consumers' emotional attachment.

Study on emotional values and computing values plays an important role in maintaining the relations between consumers and enterprises, and can help predict and explain the consumers' behaviors and reactions validly, promote corporate brand management and customer relationship management, and provide ideas for enterprises to expand market share and maintain the relationship with new and old clients.

B. Value Evaluation--factors Influencing Consumers' Behaviors

When people judge things based on feelings, they will be influenced by environment, values, experience, mood, etc., and can be especially sensitive to the existence of simulations. On the contrary, when consumers are oriented to computing, they will make decisions after deep consideration, and the process of value evaluation will be more rational. However, the evaluation process of consumption decisions is very complicated in real life, and systematic differences will be generated between emotional and computing values. Although

we can provide a psychological account based on emotions and computing, the valuation process will also be influenced by other external multiple variables. Previous scholars have found out in studies that, the value evaluation process is mixed with emotions and computing, while different evaluation modes will influence the cognition of consumers on objective things, and when being compared with single evaluations, joint evaluation is easier to stimulate consumers' scope awareness [5].

Generally, we will face multiple choices, and consumers may make different decisions based on computing value or emotional value. People may adopt different evaluation modes for the same thing in different consumption phases, for instance, before purchasing, consumers have multiple choices, and prefer to make rational decisions, but after shopping, consumers prefer to evaluate the product based on emotional factors in the using process [6].

C. Pro-social Behavior

Pro-social behavior refers to a person's behavior tendency based on free will. It is aimed to benefit others, for instance, sharing, donation, loving heart, comfort and help. Pro-social behavior is a continuum, and covers selfless altruism and helping behaviors driven by personal interests.

As per different modes of pro-social behaviors, pro-social behavior is generally divided by researchers into sharing, cooperation, helping, comfort, etc. Rosenhan et al. held that pro-social behaviors can be divided into two types in accordance with different behavior motives and consequences: The first one is spontaneous pro-social behaviors, i.e., motives are caring for others; The other one is conventional pro-social behaviors, i.e., it is expected to gain individual benefits or avoid punishment while implementing the behavior. Besides, pro-social behaviors can also be divided into pro-social behaviors under non-emergency conditions and emergency conditions as per different conditions.

Studies have shown that, consumers' behaviors to participate in social responsibility activities sponsored by enterprises, such as e-waste recycling, protection of endangered motives, donation to charity institutions, etc. belong to pro-social behaviors, which refer to all behaviors that can meet social expectations and benefit others, the group or the society, and mainly includes sharing behavior, donation behavior, cooperation behavior, helping behavior, comfort behaviors and sympathy behaviors [7]. When consumers participate in public welfare activities, especially public welfare marketing, they will be influenced by multiple factors, such as the consumption conditions, the changes to the driving and evaluation mode based on computing value and emotional factors. As for pro-social behaviors of consumers involved in the experiment, the paper adopts the situation that consumers participate in public welfare activities when spending money on medical beauty hospitals.

Different values will bring different differences in psychological characteristics. Based on the emotional value, it can increase pro-social behaviors of consumers by arousing sympathy relative to computing value. However, based on the emotional value, it can decrease pro-social behaviors of consumers by arousing fear emotions relative to computing

value. Meanwhile, income level of consumers exerts regulating effect. To sum up, assumptions are put forward below:

H1: As for the emotional value of fear relative to computing value, decrease pro-social behaviors of consumers;

H2a: Under low incomes, the emotional value of fear can decrease pro-social behaviors of consumers relative to computing value;

H2b: Under high incomes, the emotional value of fear can increase pro-social behaviors of consumers relative to computing value;

III. EXPERIMENTAL RESEARCH

Experiment 1: Influence of emotional value of fear and computing value on pro-social behavior

A. Experimental Process

Experiment 1 plans to study the influence of the emotional value of fear and computing value on pro-social behaviors. Experiment 1 adopts 2 (emotional value of fear vs. computing value) between-group designs, to verify Assumption 1. The specific mode of realization is to design the online questionnaire related to the influence of computing value and emotional value of fear on public welfare marketing influence.

The study will randomly select customers of certain hospital, and divide them into two groups for filling (n=118), and each group has 59 customers. Set the condition of questionnaire as the sales of skin beauty care seasonal card. "The hospital will use a part of the sales incomes of skin beauty care seasonal card to pay for the surgery cost of 10 poor local patients of cleft lip and palate in Tianjin". Implement the guidance of computing value for one group, and only inform them of randomly selecting RMB 100-200 unequal amount and donate to the public welfare of cleft lip and palate among RMB 3,800 quarterly sales card, help patients of cleft lip and palate to solve surgery costs, which are about 50,000 each for cleft lip and palate surgery, and emphasize that about 300-400 customers can help one poor patient of cleft lip and palate accept treatment; However, the other group of participators will be under the guidance of emotional value. Photos of children with cleft lip and palate are as shown in the questionnaire, with their family conditions, the discrimination from others, and the inconvenience in life being described below the photos. After that, ask whether participators are willing to purchase skin-care seasonal card. Finally, it is to collect the statistic information about population. The statistic information about population approximately includes gender, age, education background, and input degree.

B. Experimental Results

Analysis on the result of statistic research: The evaluation of tested value can be influenced by activating emotional value and computing value, then the tested consumption decisions will be influenced. The emotional value of fear can decrease the desire to buy skin-care cards of beauty hospitals (81.36% VS 93.22%, $\chi^2 = 15.4$, $p = 0.00$) through arousing the fear emotion of being tested in comparison with that of computing value. Research result has verified H1, i.e., the emotional value

of fear can decrease pro-social behaviors of consumers through arousing fear emotions in comparison with computing value.

Experiment 2: Comparative analysis after adding income factors

A. Experimental Process

After verifying Assumption 1, Experiment 2 will study the performance of pro-social behaviors for different income groups under computing value and the emotional value of fear. In Experiment 2, we adopt 3 (incomes vs. emotional value of fear vs. computing value) between-group designs. Similarly, the paper designs the online questionnaire about the influence of different income groups on the purchasing behaviors under the guidance of computing value and the emotional value of fear.

The study randomly selects partial customers of certain medical beauty hospital for investigation (N=264), divides them into two groups. The first group will be guided by the emotional value of fear, while the other group will be guided by computing value, and added with an important variable influencing consumption--incomes of consumers (at the beginning of the questionnaire, we will ask the participator to select their income scope, to divide them into different income groups). The contents of the questionnaire are similar to Experiment 1, with a few changes in some questions. As for the group of participators activating the computing value, they are asked to answer some questions that require computing, for instance, "If the starting fare for taxi within 2km is RMB 8, and RMB 2 is added for each kilometer beyond 2km, how much will it cost you to get to the destination 8km away". However, as for the group activating the emotional value, they are asked to image subjectively, and answer some questions below, "What will you feel when you see girls prettier than you?" "Do you have the confidence to chase boys you like? Why?". After answering all questions on the questionnaire, participators should answer the questions of the main questionnaire, and the contents include "assuming that certain medical beauty hospital releases skin beauty care seasonal card (including VISIA skin medical detection+ 12 times of water oxygen skin cleaning+ 12 times of hyaluronic acid channeling and moisturizing) at the price of RMB 3,800", which is a fair price in the market. However, on the positive side, this medical beauty hospital enjoys high authority, excellent technical capacity and high public praises from users, so would you like to buy the skin-care seasonal card? "

The research result depends on the answers of each participant for the main questionnaire, and we also predict the result based on the existing researches of foreign scholars before obtaining the result: More participators who activate the emotional value made payment than those who activate the computing value, and individuals with higher incomes can be more easily guided by the emotional value, while individuals with lower incomes can be more easily guided by computing value. Besides, more individuals with higher incomes made payment than individuals with lower incomes in both the computing value and the emotional value.

B. Experimental Results

As per incomes conditions of participators, we divide incomes of participator groups into three types, including lower incomes (below RMB 10,000), middle incomes (RMB

10,000-15,000) and higher incomes (above RMB 15,000). Table 1 is the basic condition about the investigation objects selected for the experiment.

TABLE I CONDITIONS ABOUT PARTICIPATORS UNIT: PERSON (PERCENTAGE)

	Number of people with higher incomes	Number of people with middle incomes	Number of people with lower incomes	Total number
Emotional value	10	10	119	139
Number of people who are willing to buy	5(50.0%)	7(70.0%)	71(59.7%)	83(59.7%)
Computing value	10	8	107	125
Number of people who are willing to buy	3(30.0%)	5(62.5%)	77(72.0%)	85(68.0%)

In combination with the result in Table 1, we can easily find out that: In the investigation about activating emotional value, the number of customers who are willing to buy beauty skin-care card, n1=83 (including 5 customers with higher incomes, which occupy 6% of the total purchasers, and 50% participators of the group; 7 customers with middle incomes, which occupy 8% of the total purchasers, and 70% participators of the group; 71 customers with lower incomes, which occupy 86% of the total purchasers, and 60% participators of the group); In the investigation about activating computing value, the number of customers who are willing to buy beauty skin-care card, n2=85 (including 3 customers with higher incomes, which occupy 3.5% of the total purchasers, and 30% participators of the group; 5 customers with middle incomes, which occupy 5.9% of the total purchasers, and 62.5% participators of the group; 77 customers with lower incomes, which occupy 90.6% of the total purchasers, and 71.96% participators of the group); After implementing the guidance of computing value, the desire for middle-income and higher-income groups to buy will be lower than the result guided by the emotional value, and the degree of decrease for groups with higher incomes is bigger (which is decreased by 20%), while the desire for groups with lower incomes to buy is obviously higher than the result after implementing the guidance of emotional value (which is increased to 71.96% from 60%). Besides, we should notice that, the number of people who activate the computing value and are willing to buy the seasonal card can occupy 68%, which is higher than that for the number of people who activate the emotional value and are willing to buy, i.e., 59.7%.

If we regard middle incomes as the demarcation point, we can obviously see that, high-income and low-income groups can both have similarities and differences in the consumption behaviors guided by the emotional value and computing value. No matter it is to activate computing value or emotional value, middle-income groups always have similar consumption behaviors, without obvious changes; Besides, as incomes increase, a trend of decrease is shown in the number of people who are willing to buy among consumers guided by two values, i.e., although incomes increase, people's desire to buy beauty skin-care card is decreased. The difference is that, groups with lower incomes can gain a better simulation effect, in case of activating the computing value, rather than the emotional value,

on the contrary, groups with higher incomes can gain a better simulation effect, in case of activating the emotional value, rather than the computing value.

As can be seen from the aforementioned statistical analysis result that: Income levels can exert an obvious influence on pro-social behaviors ($\chi^2= 5.29, p = 0.02$), and when low-income consumption groups arouse the emotional value of fear, consumers' pro-social behaviors will be decreased relative to the computing value (60% vs. 72%, $\chi^2= 15.4, p = 0.00$), but when high-income consumption groups arouse the emotional value of fear, consumers' pro-social behaviors will be increased relative to the computing value (30% vs. 50%, $\chi^2=91, p =0.34$), because low-income groups prefer to escape based on their own capacities, in face of "not wonderful" things, while high-income groups prefer to make a change. The experiment result has verified H2a and H2b.

The aforementioned result may also be different from the existing similarities we expected. Firstly, more participators who activate the emotional value of fear are willing to make payment than those who activate the computing value, so both high-and low-income groups have certain psychological repulsion against fear emotions. Secondly, as for low-income groups, the emotional value of fear exerts a negative effect relative to the computing value; As for high-income groups, the emotional value of fear can generate positive effects on purchasing behaviors relative to the computing value, so if provide positive emotional value guidance to consumers, the purchasing behaviors of high-and low-income groups may be further improved.

IV. CONCLUSION AND LIMITATIONS

According to the result of Experiment 1, consumers' pro-social behaviors will be influenced by the mode of evaluation and the evaluation environment. The emotional value of fear can decrease consumers' pro-social behaviors, arouse their psychological repulsion, and under "not wonderful" or "ugly" environment, both the emotional experience of consumers and the willingness to pay will decrease. As for enterprises, in order to arouse consumers' active emotional experience, it is applicable to set certain shopping scenarios for specific target groups, for instance, pasting and placing more photos of beautiful women at the

medical beauty hospital, and adopting more hypothetical scenarios when answering consultations or promoting products, to stimulate consumers' emotional thinking, or setting some slogans and LOGO to arouse consumers to associate, then realize the objective of guiding consumers to purchase. Consumption groups oriented to computing have stronger logical thoughts and the ability of judgment, and make decisions to maximize personal interests, and reserve bigger consumer surplus for the purchased commodities. As for such consumption group, it is applicable to stimulate consumers' consumption behaviors by calculable promotion and other modes from a rational perspective.

Experiment 2 shows the influence of incomes on consumption behaviors, and as can be seen from the experimental result, we can conclude that incomes are inversely proportional to consumers' purchasing desire, but it has certain limitations, because products used in the questionnaire mentioned in the paper is RMB 3,800 skin-care card, so for high-income groups, they have higher requirements for beauty pursuit and skin-care relative to low-income groups, so if we change products to a higher grade of skin-care products, the experimental result may be different. We can be certain that "plastic surgery" and "beauty skin-care products" consumption have become normal. A good looking can make people more confident, get others' respect and adorations, so people are often willing to invest in beauty. However, the medical beauty hospital should seize the psychology of consumers to purchase beauty, put forward different products for consumers with different incomes, set different grades of beauty products, and provide affordable products and services for groups with different incomes. The result of Experiment 2 has told us that fear emotions can decrease pro-social behaviors of low-income groups and increase pro-social behaviors of high-income groups relative to computing value. Therefore, enterprises should formulate different sales strategies as per income conditions of consumers: As for low-income groups, we can use more digital and other marketing languages, while more emotional induced marketing languages for high-income groups, to realize maximum sales volume.

Through comparing Experiment 1 and Experiment 2, we can conclude that, public welfare marketing can promote consumers' consumption behaviors. In Experiment 1, under the guidance of two values, the number of participators who are willing to buy is higher than that in Experiment 2, so it is certain that public welfare marketing can stimulate consumers to make purchasing decisions. The paper adopts the field experiment method to study two different consumption psychologies for consumers to make purchasing decisions: The orientation of emotional value and computing value. Research has shown that different stimulation modes can activate consumers' different value evaluation psychologies, and enterprises can set different purchasing scenarios to stimulate consumers to evaluate based on personal demands, then generate the purchasing behaviors. The paper is restricted by experimental environment, and cannot fully simulate actual purchasing scenarios, and since many variables are hard to control, the universality of experimental result should be further verified.

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