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RESEARCH ARTICLE

A STUDY OF CONSUMER BEHAVIOR AND CONSUMER SURPLUS: FROM THE MENTAL ACCOUNTING PERSPECTIVE

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ABSTRACT

Consumer behavior studies that solve consumer problems are sophisticated and complex and require a thorough understanding of the market. In this study, we aim to explore new possibilities in consumer behavior based on the findings of behavioral economics. First, we recruited subjects and used the technique of experimental economics to confirm the consumer surplus mechanism based on the conventional theory of economics. Then, we introduced Thaler's (1999) concept of mental accounting, to observe changes in consumer behavior and consumer surplus. Finally, from the experimental results, we suggest new possibilities from a behavioral economics perspective. We hope that this study will contribute to future consumer behavior research.

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INTRODUCTION

Consumers look for hidden value in products. Their level of satisfaction is called utility, which consumers are assumed to maximize. Here, we describe the concept of consumer surplus. Consumer surplus is defined as follows. "Consumer surplus = payment allowance (the maximum amount paid) − actual payments." In other words, a consumer's cognition and memory and his inherently rational economic behavior determines purchase decisions. However, in reality, human behavior is not always reasonable. Behavioral economics attempts to explain the psychological factors that affect the economic decisions of individuals. In this study, we introduced Thayer's (1999) concept of mental accounting, which represented pioneering research in the field of behavioral economics, to understand the changes in consumer behavior and consumer surplus.

Overview of previous research

Microeconomics focuses on rational consumer behavior. In Della Vigna and Malmendeir (2004), the mismatch between consumer preferences and consumer bias was investigated. Kahneman, who was awarded the Nobel Prize in Economics, found evidence of irrational human behavior (Tversky and Kahneman, 1981; Tversky *et al*., 1990). In the field of psychology, even with the choice of the same value, a cognitive mismatch relates to the selection's degree of difficulty. In other words, the selected choice is higher when other options are relatively low. This phenomenon is called cognitive dissonance (mismatch) (Brehm, 1956; Egan, Santors and Bloom, 2007).

Consumer behavior studies have incorporated psychology in their theory of consumer choice in microeconomics. To understand consumer consumption and the market, one must analyze the behavior of the multi-faceted consumer. Mental accounting refers to an individual's evaluation of his/her monetary action and their tendency to organize their money into separate accounts. Differences in this behavior influence consumer surplus. Specifically, humans have accounting standards that are categorized and labeled in their minds (Thaler, 1999). In the case of using the money subject earned from experiments it has been confirmed a tendency that the more aggressively bet. With unexpected income, consumers spend more aggressively (Arkes *et al*., 1994). Sensory information processing research now is underway. Brain function measurement using non-invasive fMRI and fNIRS is called neuro-economics. Previous research included a study on mental accounting as a principal investigator (Fujimori, 2012). Our results revisit the basis of consumer behavior research and

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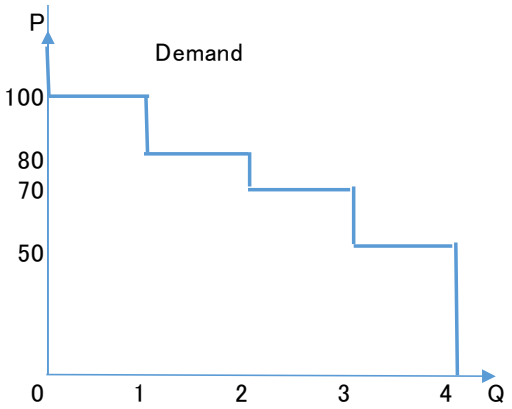
uncover new possibilities; specifically, the concept of consumer surplus in microeconomics, incorporating mental accounting and expanding the discussion of consumer behavior.

Consumer surplus

Buyers' spending patterns create a demand curve. Here, price represents the payment allowance of a marginal buyer. Therefore, it is possible to measure consumer surplus from the demand curve. It is also possible to measure consumer surplus in the total market. In this case, the area of the demand curve above the price is the consumer surplus.



Note: Demand curve height represents a buyer's payment allowance

Fig. 1. Demand curve and consumer surplus

Price describes the effect on consumer surplus. Price is P1, and demand is represented by Q1. Consumer surplus corresponds to the area of the ⊿ABC. When the price falls from P1 to P2, demand increases from Q1 to Q2. Consumer surplus expands to the area of the ⊿ADF. The increase in consumer surplus (⊿BCFD) reduces the payments of consumers who participated in the market (⊿BCED) as well as new consumers participating in the market at a lower price (⊿CEF). The buyer is a consumer, in accordance with economic rationality, who wants to buy goods at a minimum rate possible. Therefore, the consumer price surplus decreases the original consumer surplus (⊿ABC), and the buyer who already participated in the market (⊿BCED) increases, ┼ newly receive the buyer that you enter the market minute (It will increase to ⊿CEF).

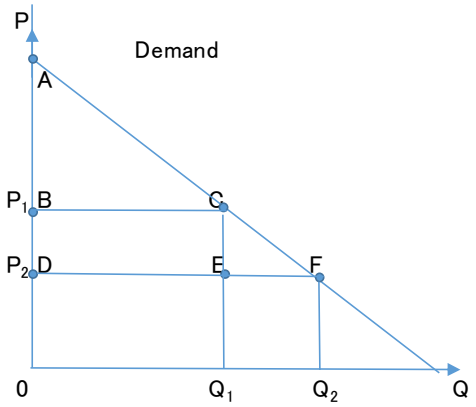
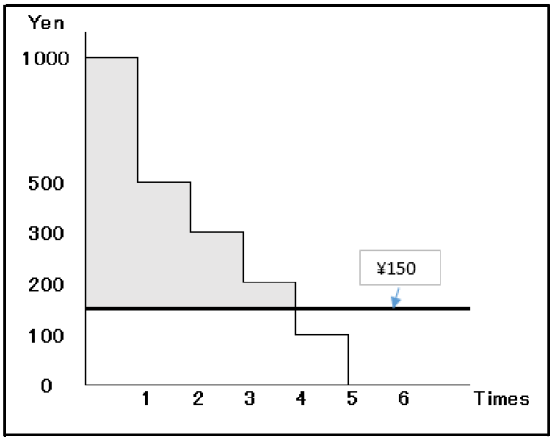


Fig. 2. Price changes and changes in consumer surplus

Experiment

First, using the technique of experimental economics, we recruited subjects, to confirm the consumer surplus mechanism based on the conventional theory of economics. In this study, the concept of mental accounting is a part-time job fee earned as "pocket money," and unexpected revenue is referred to as "windfall money."

Questionnaire1: You're thinking of going to an amusement park. There are a variety of rides in amusement park. Worth a ride in one for you is worth 1,000 yen. Let's going to not want to ride the first six or more second unit is 500 yen, third one is 300 yen, fourth one is 200 yen, fifth one is 100,. Now, vehicle fee is 150 yen in this amusement park. −Do you ride How many vehicles?



Source: Ito (2009), p.63.the author has created Fig 3.

Fig. 3. Consumer surplus and the individual demand curve, measuring consumer surplus

In Table 1, checking the consumer surplus mechanism, using the technique of experimental economics, gives a descriptive answer by conducting a questionnaire survey. The procedure of the experiment is as follows: the questionnaire has three parts and the contents are different in control and in experiments 1 and 2. Subjects were randomly distributed to obtain immediate answers. Questionnaire 1 of control is, do not specify the pocket money. The result is shown in Fig 4. From the numerical value represented by each price, consumer surplus is read. The blue portion of the figure is the consumer surplus, the subject tries to ride as long as up to four eyes in amusement park rides. Then, I added the setting of "pocket money" and "windfall money" in this process. Questionnaire 2 of Experiment 1, adding a notation of "subject has earned part-time job generation," I had the image of a pocket money. Questionnaire 3 of Experiment 2, was changed to the notation of "pocket money that I got from happened distant relatives," I had the image of a windfall money. The result is shown in Fig4. From the numerical value of the figure, the subject

should ride as far up to four eyes in amusement park rides. In contrast, in the windfall money, the subject tries to catch even a five second.

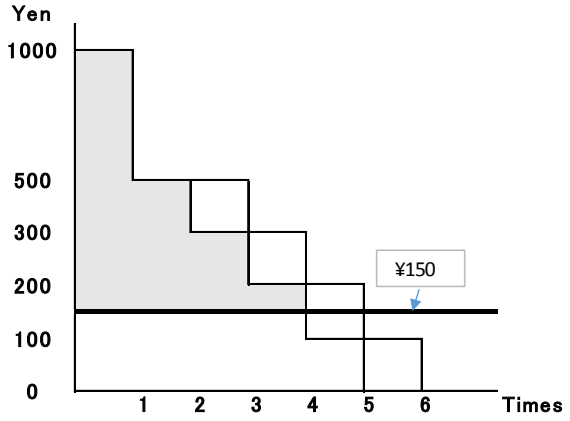


Fig. 4. Comparison of mental accounting and consumer surplus

Consideration

In this study, we expanded the discussion from the results of previous research. Economic theory is based on the assumption of alternative possibilities for money. Not the label name and the like are in the money. "you earned on your own" is also, because It does not change the fact that pocket money, obtained by chance from distant relatives, and money paid at the amusement park should be the same. However, if the subject psychologically evaluates and organizes his financial actions and assigns it to a particular account book, it is considered a changed action. In this way, dealing with money as if it were a "separate accounting" reflects the value function in the Prospect Theory of behavioral economics. The value function has the following three properties ① reference point dependence. ② loss avoidance, and ③ sensitivity diminishing resistance. Here, I would like to consider the differences between the "Settings" in reference point ①. When choosing payment in an amusement park, it is assumed that one determines the payment amount by comparing costs and benefits. However, in the case of pocket money (part-time income, earned on your own, recognized as money from distant relatives) is unexpected revenue that may change the setting of the windfall reference point, as easy money. Therefore, an evaluation of dependent monetary action to a reference point is considered a change of consumption behavior.

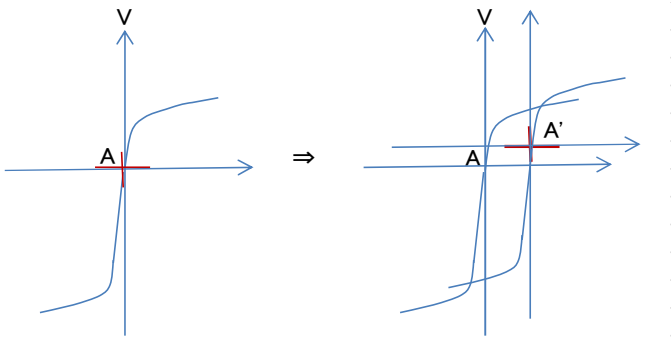


Fig. 5. Value function: Change of the reference point of pocket money and windfall money

Conclusion

In this study, the concept of consumer surplus in microeconomics, incorporating mental accounting and consumer behavior, is assumed to change. If consumption is executed using easy money, compared with pocket money, differences were observed in consumer surplus. Furthermore, regarding the relationship of consumer behavior and consumer surplus, changes were observed in consumer behavior. This fact supports the hypothesis of this study. For economic rationality, assuming conventional economics, I want to suggest new possibilities of consumer behavior from this study's experimental results.

Note

1. Simply looking at the historical background of consumer behavior research, during the 1930s, research was underway on the preference theory of microeconomics. As basic economics was insufficient, it began to incorporate related fields, such as sociology and psychology. By the 1970s, "consumer behavior theory" was formed. In the 1980s, information processing was incorporated, and in the 1990s, brand knowledge was added, forming a new behavioral economics in recent years.

2. If the price of a single juice is assumed to be 300 yen, and if a consumer buys five bottles of juice, 300 yen × 5 = 1500 yen paid. In contrast, this consumer believes that the purchase is worth ¥ 5500: 2000 + 1400 + 1000 + 700 + 400. Therefore, the consumer surplus is 4000 yen: 5500 yen minus 1500 yen.

3. Previously, the particular problems of the reference point (Fischhoff, 1983) and the plurality of issues of a reference point (Maule, 1989) have been pointed out. Tversky and Kahneman (1981) define a reference point as "formats and frame selection problem that decision makers use, decision makers of norms, habits or, depends on the personal characteristics" (p. 453).

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