

An Empirical Study of the Relationship among Self-Control, Price Promotions and Consumer Purchase Behavior

Xi Zhong, Ken Ishibashi, Katsutoshi Yada



文部科学大臣認定 共同利用・共同研究拠点

関西大学ソシオネットワーク戦略研究機構

The Research Institute for Socionetwork Strategies,
Kansai University

Joint Usage / Research Center, MEXT, Japan

Suita, Osaka, 564-8680, Japan

URL: <http://www.kansai-u.ac.jp/riss/index.html>

e-mail: riss@ml.kandai.jp

tel. 06-6368-1228

fax. 06-6330-3304

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Xi Zhong
Graduate School of Business and Commerce
Kansai University
Osaka, Japan
k392491@kansai-u.ac.jp

Ken Ishibashi
Data Science Laboratory
Kansai University
Osaka, Japan
r108047@kansai-u.ac.jp

Katsutoshi Yada
Faculty of Business and Commerce
Kansai University
Osaka, Japan
yada@kansai-u.ac.jp

Abstract—Price promotions as a marketing tool can effectively attract customers to buy products impulsively. However, when customers are in the face of price promotions, their self-control also emerges. Their desire to consume collides with their self-control, which will react differently to vice and virtue category products. In order to figure out the relationship among self-control, price promotions and consumer purchase behavior, this paper uses shopping path and POS data to study customers' shopping and buying behaviors in stores. Through logistic regression analysis, we verified how self-control and price promotions affected customers' purchase process. Then we found that customers would be more likely to purchase vice category products with price promotion when they stayed in a store for a certain period. This paper is the first one to empirically study the effect of both self-control and price promotions on customers' purchase behavior of vice category products. It can provide market managers with a better understanding on customers' purchase behavior and a more effective way to increase sales.

Keywords—price promotion, self-control, vice category product, purchase behavior, shopping path

I. INTRODUCTION

Hofmann (2009) [1] proposed that customers will automatically generate an impulsive response when they face the temptation of goods, but they will immediately evaluate the goods and deliberately restrict their behaviors. Price promotions, as a marketing tool, can effectively attract customers to buy impulsively. However, when customers are in the face of price promotions, their self-control will emerge. Their desire to consume collides with their ability of self-control, which then leads to different consumer behaviors. Because customers react differently to vice category products (which are relative luxuries) and virtue category products (which are relative necessities), market managers can make more profits by properly carrying out different price promotions for vice and virtue category products [2].

In recent years, with the rapid development of RFID (radio frequency identifier) technology, many retail stores start to use the technology to better trace the movement of customers in stores. By studying customers' stay on shopping paths, it is

easier to clearly understand each customer's visit, shopping and purchasing behavior in each sales area. Shibasaki et al. (2016) [3] used the actual supermarket data and used the visible movements of customers and reduction of customers' regulatory resources to analyze the purchasing process of customers in stores from both physical and psychological angles. Wertenbroch (1998) [4] believe that making good use of price promotions and self-control will have a greater impact on customers' behaviors of purchasing vice and virtue category products, which can provide market managers with pricing basis and maximized profits so that they can be classify customers and provide more personalized service to them.

But so far, no one has studied the impact of price promotions and self-control on customer consumption of vice and virtue category products directly through empirical methods. This paper focuses on the shopping path of customers in stores, through the studies of customers' visit, shopping and buying behaviors in stores and verifies the influence of reducing regulatory resource and price promotions on purchasing vice category products.

Starting from the comparison of related theories and practical data, this paper analyzes customers' purchase behavior of vice category products and virtue category products by focusing on price promotions and self-control, which play a very important part in making sales. This paper is the first one to study the impact of price promotions on customers' purchase behavior of vice category products by empirically analyzing the Japanese supermarket data. And this paper is based on the research by the existing study [3], further reducing the scope of research objects and re-examining the influence of self-control on purchasing vice category products. This paper is also the first one that takes advantage of shopping path data and POS data to research the influence of the price promotions and self-control on customers' purchase behavior of vice category products by empirical analysis.

II. LITERATURE REVIEW

Products treated in supermarket are classified into various categories, and surveys show that consumers' response varies

according to product categories. Thus, store managers need to make sales strategies suitable to product categories. For example, when consumers are going to choose chocolate cake or fresh fruit as dessert, they may evaluate products from different viewpoints. Because cake is relatively delicious, it immediately satisfies people’s desire but is easy to make them fat. On the other hand, fresh fruit would be relatively healthy in the long term [4]. From this point, the existing study [4] proposed a definition on products by virtue category products and vice category products. When immediate pleasure of product X is larger than is larger than comparable product Y’s one, we call product X a vice category product relative to Y. On the other hand, when delayed utility of comparable product Y is larger than product X’ one, we call product Y a virtue category product relative to X. Existing studies [2, 4, 5] demonstrated that sales promotion suitable to vice category products was different from appropriate promotion for virtue category products. Wertenbroch (1998) [4] found that price promotion like unit price cuts was effective to increase sale volume of vice category products. In addition, the study demonstrated that consumers strongly responded to promotion with quantitative discount on virtue category products such as price cuts of large volume package. The subsequent studies [2, 5] researched appropriate price promotion with additionally classifying virtue and vice category products. By the definition of existing study [4], we can make further research on how customers’ purchase behavior is affected by vice and virtue category products.

Existing studies [2, 4, 5] stated that one factor of the effect of price promotion was self-control, but did not consider the change of the influence of self-control during shopping. Self-control means that an individual consciously changes her/his initial reactions to suppress impulsive behavior so that s/he can achieve a long-term goal [6]. In the context of shopping in supermarket, self-control can relate to the suppression of unnecessary consumption and the impulsive purchase. The existing study [4] explained how impulsive behavior happened based on the desire-willpower model of self-control [7]. That is, impulsive purchase is caused when temptation of product enhanced by price promotion exceeded consumer’s willpower. In a case of vice category products, unit price cuts are expected to be more effective than quantitative discount because buying large volume of vice category products can be easy to cause overconsumption [4]. Existing studies on price promotion demonstrate their findings under the assumption where effects of self-control on consumers are constant during shopping. However, the existing study [3] showed that effects of self-control changed during shopping, and then purchase behaviors were influenced. This influence of self-control is based on the resource model (strength model of self-control) [8]. The resource model assumes that people consume some resources when they do self-control. That is, customers consume their regulatory resources to make decision for shopping, and then they becomes easy to purchase vice category products by giving in to the temptation. The existing study [3] verified the effect of reduction of regulatory resources on purchase behaviors of vice category products without considering influence of price promotion.

On the other hand, existing studies on price promotion [2, 4, 5] researched purchase behaviors of vice category products under the condition with the influence of self-control. Thus, when consumers’ regulatory resources reduced, effects of price promotion and self-control effect purchase behaviors have not be clarified so far. The clarification of relationship among self-control, price promotion and consumer purchase behavior is necessary to improve the effect of promotion in supermarket.

III. FRAMEWORK AND HYPOTHESES

In this study, we attempt to clarify the relationship among price promotion, self-control and consumer’s purchase behavior by focusing on vice category product. Firstly, this study develop a new framework through appending price promotion to a model of Shibasaki et al. (2016) [3] that explains the relationship between self-control and purchase behavior by using shopping path data. Next, based on the proposed framework, we describe hypotheses for effects of price promotion and self-control on purchase behavior.

A. Framework

The proposed framework is shown in Fig. 1. In Fig. 1, the relationship between self-control and consumer’s purchase behavior is based on the framework proposed by Shibasaki et al. (2016) [3]. In addition, the proposed framework is developed based on the relationship between price promotion and purchase behavior on virtue and vice category products in the existing study [4]. As shown in Fig. 1, this study addresses purchase behavior on vice category products only. Existing studies on the relationship between price promotion and purchase behavior [2, 4, 5] mentioned that self-control was an important factor to clarify the impact of price promotions. However, they did not quantify self-control. On the other hand, Shibasaki et al. (2016) [3] used the regulatory resources to quantify the influence of self-control on consumer’s purchase behavior, but they did not consider other factors like price promotion. Therefore, this study examines the influence of promotion and self-control on consumer’s purchase behavior of vice category products by combining the frameworks of existing studies.

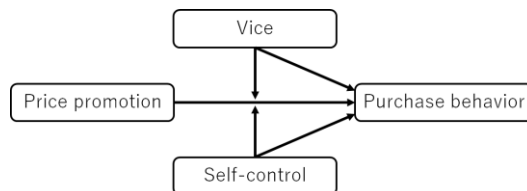


Fig. 1. Framework of this study

This study focus on confectionery as an object of vice category product in order to simplify the analysis. Wertenbroch (1998) [4] and Parreño-Selva et al. (2014) [2] divided products into vice category products/virtue category products, while Yan et al. (2017) [5] put forward the concepts of healthy food and unhealthy food. Shibasaki et al. (2016) [3] selected confectionery as the object of analysis of unhealthy food, while Hui et al. (2009) [9] considered confectionery to be a vice category product. Shibasaki et al. (2016) [3] and Hui et al.

(2009) [9] both used confectionery as an example of unhealthy food or vice category product in their researches, it is within reason not to specifically distinguish the concepts of vice category products and unhealthy foods. Thus, this study only select vice category products as the object of analysis. Furthermore, Narasiman et al. (1996) [10] believed confectionery was one of the product that could easily cause impulsive purchase. That is to say, confectionery can easily cause self-control failure [11, 12]. So this paper chooses confectionery as the research object of vice category product.

Price promotion has been used as changes in the unit price of product in existing studies [4, 5]. They demonstrate that if the unit price of product goes down, consumers' purchase quantity of vice and virtue category products will change differently. Similarly, Parreño-Selva et al. (2014) [2] believes that, when the unit price of product is lower than its regular price. Therefore, we define price promotion as a price reduction of product from its regular price. Meanwhile, this study defines the daily price which is most frequently put on the product during the month as its regular price.

In this study, the strength of consumer's self-control is quantified by using the time spent for going from the entrance of store to confectionery sale area, by relying on Shibasaki et al. (2016) [3]. That is, this elapsed time is a proxy of the reduction of regulatory resources, and represents the influence of self-control based on the resource model [8]. On the other hand, price promotion for confectionery is a factor causing impulsive purchases, its effect can be considered to arise from a failure of self-control explained by desire-willpower model [7]. In this way, we clarify the effect of self-control on purchase behavior for vice category products with distinguishing an influence of price promotion.

In the proposed framework, purchase behavior is defined by relying on the existing studies using shopping path data[3, 9]. Existing studies on the relationship between price promotion and purchase behavior of vice/virtue category products [2, 4, 5] used POS data, but Shibasaki et al. (2016) [3] paid attention to not only customers' final purchase results but also customers' purchase process. Relying on the framework of Hui et al. (2009) [9], the existing study [3] defined purchase process contained in shopping path data. Hui et al. (2009) [9] divided customer purchase behavior into visit, shop and buy decisions. "Visit" means that a customer arrives at a store or an sales area in the store. "Shop" means that a customer stays the visited store or sales area, and considers whether s/he buy or not buy products. When the customer has stopped for 2 seconds or longer, we can consider her/him shopping in the sales area [13]. Buy means the customer pays for products and obtains their ownership. The purchase behavior in the proposed framework is also based on the purchase process of Hui et al. (2009) [9]. In this way, we examine the effects price promotion and self-control on these 3 decision-making processes.

B. Hypotheses

In this study, by using the proposed framework, we verify how the price promotion and the self-control based on reduction of regulatory resources effect on purchase behavior respectively. In addition, we examine interaction between price

promotion and self-control. This interaction has not been studied so far, but the effect of price promotion and reduction of regulatory resources is expected to promote purchase behavior on vice category products additively or multiplicatively because of the failure of self-control. Therefore, this study attempts to obtain useful findings for practical business through verifying three hypotheses shown in TABLE I. TABLE I represents hypotheses on impact of each factor on shopping and buying in purchase process. This study cannot examine the effect of each factors on visit that is a behavior in purchase process as the same as Shibasaki et al. (2016) [3] because we use elapsed time when a customer goes from entrance to confectionery sales area. That is, the effect of each factor on shopping is verified in customers who visited confectionery sales area. Furthermore, hypotheses on buying is analyzed by focusing on customers who shopped in confectionery sales area.

TABLE I. HYPOTHESES OF THIS STUDY

Hypothesis	Shop	Buy
H1: Regulatory resource	+	+
H2: Price promotion	+	+
H3: Interaction	+	+

Firstly, we verify the effect of self-control based on resource model [8] in hypothesis H1. People use regulatory resources no matter what they are doing in store, especially when they are selecting products [6, 14]. Shibasaki et al. (2016) [3] used the passing of time spent to go from the entrance to the target area to represent the decrease of regulatory resources. And then, they verified the effect of elapsed time on customer's shopping and buying behaviors. Their study found that the longer customer's time spent for going from the entrance to confectionery sales area was, the easier it was for her/him who visited confectionery sales area to purchase confectionery impulsively. Similarly, we verify the impact of self-control on customers' purchase behavior by the following hypothesis:

H1: The less regulatory resources a customer has, the higher her/his probability to do purchase behavior (shopping and buying) on vice category product becomes.

Secondly, the hypothesis H2 is verified to clarify the effect of price promotion on purchase behavior of vice category products. The existing studies [2, 4, 5] analyzed the impact of price promotion by using the changes in sales volume or sales amount when price promotion was performed. Based on these papers, we verify the following hypothesis by paying attention to the changes in the probabilities of customer's shopping or buying when certain confectionery is in price promotion:

H2: When a vice product is in a price promotion, consumers are more likely to do purchase behavior (shopping or buying) on it impulsively.

Finally, we verify the effect of interaction between price promotion and regulatory resources on purchase behavior of

vice category products in the hypothesis H3. The impacts of price promotion and the decrease of regulatory resources have been studied independently so far. However, customer’s purchase behavior in supermarket is influenced by these factors simultaneously. Therefore, we clarify the effect of interaction between price promotion and decrease of regulatory resources through verifying the following hypothesis:

H3: When a vice product is in a price promotion and as a consumer’s regulatory resources become less, her/his probability to do purchase behavior (shopping and buying) on it impulsively grows even higher.

C. Data and Variables

This study verify the hypotheses described above by using customers’ shopping path data and POS data provided from a company. The data was collected from 24 Nov. 2013 to 30 Nov. 2013 at a supermarket in an Osaka suburbs, and simultaneously marketing information such as floor layout (Fig. 2), transaction data etc. were also collected. This store consists of one entrance area, thirteen sales areas and cash register. Fig. 3 is a shopping cart with RFID tag. According to the customers’ path data recorded by RFID tag, we can understand how customers are moving in the store. 4,233 shopping paths were recorded during the week. In collected data, the average amount that the customers spent was about 2,565 yen, and the average number of item types bought was about 10. The average time that customers spent for shopping was about 19 minutes.

In this study, we focus on customers’ purchase behaviors at confectionery sales area as the same as the existing study [3]. The supermarket done the data collection did price promotion on some confectionery products every day. Thus, we only select one brand product in order to examine whether the existence of price promotion has an impact on customer purchase decision. Based on the analysis of given POS data, we chose potato chips as our specific research object, which sales volume was top one of confectionery products. The regular price of the potato chips was 98 yen in Nov. 2013, and its daily unit price with price promotion was 78 yen. Moreover, only one day was done price promotion on the potato chips in the week when shopping path data was collected. Therefore, the variable P_i which represents whether price promotion on potato chips was done or not when customer i visited to the confectionery sales area is defined as follows:

$$P_i = \begin{cases} 1 & \text{potato chips have price promotion} \\ 0 & \text{potato chips don't have price promotion} \end{cases} \quad (1)$$

In this analysis, we verify the hypotheses by focusing on purchase behaviors of customers who visited to the confectionery sales area. The time when a customer spent for going from the entrance of store to the confectionery sale area was calculated from collected shopping path data. In the given data, customers visited to the confectionery sales area many times during the one shopping. However, a large part of them was derived from the error of RFID tag attached to shopping cart. Thus, in order to remove customers who visited the target

area many times, this study uses shopping paths of which interval time from the first time when a customer visited at the confectionery sales area to the last time when s/he left from there was within 10 minutes. In addition, we remove shopping paths of which the time spent for going from the entrance to the confectionery sales area was more than 50 minutes because they are likely to include behaviors not related to purchases. Extracted data based on the handling contained 1,419 shopping paths of which customers visited to the confectionery sales area. Among them, 962 visitors (about 68% = 962 / 1,419) shopped in the confectionery sales area. That is, 962 visitors stayed in that area over two seconds. And then 26 shoppers (about 3% = 26 / 962) bought the potato chips. The time when customer i spent for going from the entrance to the confectionery sales area is noted as t_i . The average of elapsed time t_i was about 584 seconds (about 10 minutes), its median value was 492 seconds (about 8 minutes), and its standard deviation was 416.524. The distribution of elapsed time t_i is shown in Fig. 4.

This study defines the dependent variables “Shop” and “Buy” based on the existing studies [3, 9]. Firstly, if customer i shops at the confectionery sales area (stops and considers a product purchase) then this is represented as $S_i = 1$, and if s/he passed without shopping then this is represented as $S_i = 0$. Next, if customer i bought the potato chips which is the research object, this is represented as $B_i = 1$; if not bought, $B_i = 0$. By using these variables, we develop models to verify the hypotheses described above.

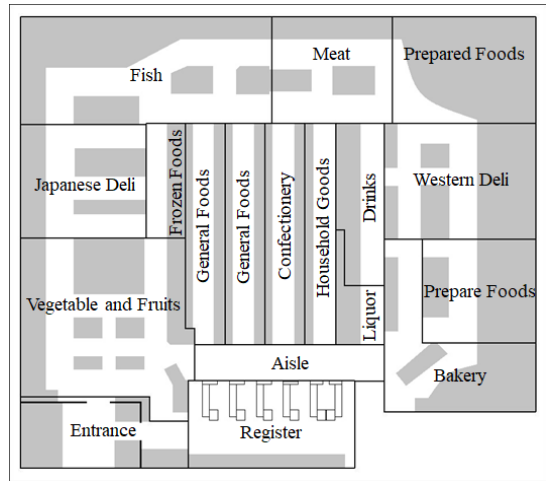


Fig. 2. Floor layout



Fig. 3. RFID tag attached to shopping cart

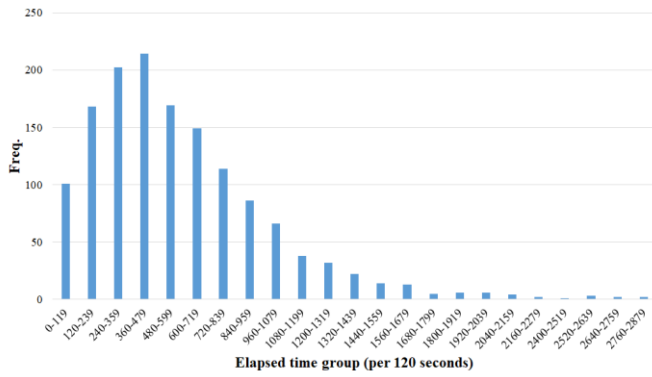


Fig. 4. Distribution of elapsed time (sec.)

IV. RESULTS

By using logistic regression analysis, this study verifies the hypotheses described in Chapter III in order to clarify effects of price promotion, self-control based on resource model and these interaction on purchase behavior for vice category products. Relying on existing studies [3, 9], we develop two models on shopping and buying as purchase behaviors.

“Shop” and “Buy” that are dependent variables of our models are binary variables S_i and B_i described in Chapter III. Firstly, a model on shopping is developed by using shopping paths which visited the confectionery sales area. That is, this model explains the conditional probability of shopping when a customer visited the confectionery sales area. Next, we develop a model on buying by using customers’ data which shopped at the confectionery sales area. In this way, the change of probability on purchasing the target product is analyzed when a customer shopped at the confectionery sales area. As described in Chapter III, explanatory variables of these models are P_i which represents whether price promotion on potato chips was done or not when customer i visited to the confectionery sales area, the time t_i spent for going from the entrance to the target area, and these interaction $P_i * t_i$. TABLE II is the result of developed model for shopping, and the result of buying is shown in TABLE III. In addition, the results for verification of hypotheses are shown in TABLE IV.

Firstly, in the verification of hypothesis H1 on self-control based on resource model, the effect on shopping was supported as shown in TABLE IV. TABLE II showed that coefficient value of t_i in model for shopping was 0.0003307 and was significant ($P < 0.05$). On the other hand, its coefficient value in model for buying was -0.003411 and was not significant ($P > 0.05$) as shown in TABLE III. Therefore, the reduction of regulatory resources has an effect promoting consumers to shop in confectionery sales area. Furthermore, it indirectly increases the probability to purchase confectionery product because the model for buying was developed by focusing on customers who shopped in confectionery sales area. This result is consistent with the result of existing study [3].

Next, in the verification of hypothesis H2 on price promotion, the effect on buying was supported as shown in TABLE IV. Coefficient value of P_i in model for shopping was -0.3048948 and was not significant ($P > 0.05$) as shown in

TABLE II. On the other hand, TABLE III showed that coefficient value of P_i in model for buying was 1.490712 and was significant ($P < 0.05$). Therefore, price promotion can effect on buying confectionery product.

Finally, TABLE IV showed that effects on shopping and buying were not supported in the verification of hypothesis H3 on the interaction between self-control and price promotion. TABLE II showed that coefficient value of interaction ($t_i \times P_i$) in model for shopping was 0.00047 and was not significant ($P > 0.05$). Moreover, TABLE III showed that coefficient value of interaction in model for buying was 0.0004483 and was not significant ($P > 0.05$). Therefore, self-control and price promotion can independently effect on purchase behaviors on confectionery product. That is, the combination of these effects is expected to promote consumers to shop and buy.

TABLE II. RESULT FOR SHOPPING (N = 1419, $\chi^2=9.85$, $P=0.0199$)

Explanatory variable	Coef.	Std. Err.	P-value
intercept	0.5628088	0.1086794	0.000
t_i	0.0003307	0.0001581	0.036
P_i	-0.3048948	0.2642878	0.249
$t_i \times P_i$	0.00047	0.0004034	0.244

TABLE III. RESULT FOR BUYING (N = 962, $\chi^2=17.45$, $P=0.0006$)

Explanatory variable	Coef.	Std. Err.	P-value
intercept	-3.920973	0.4909358	0.000
t_i	-0.0003411	0.0007342	0.642
P_i	1.490712	0.7002321	0.033
$t_i \times P_i$	0.0004483	0.0009686	0.644

TABLE IV. RESULTS FOR VERIFICATION OF HYPOTHESES

Hypothesis	Shop	Buy
H1: Regulatory resource	+	N. S.
H2: Price promotion	N. S.	+
H3: Interaction	N. S.	N. S.

+: corresponding variable has positive effect

N. S.: corresponding variable is not significant

V. CONCLUSIONS

This study is the first one to quantitatively analyze the influence of self-control and price promotion on customer

purchase behaviors by using both the information about their shopping paths obtained from RFID and POS data at the same time. In this paper, we developed a model focusing on the relationship among changes of self-control power due to reduction of regulatory resources, price promotion and purchasing vice category products. The obtained results demonstrated that the two factors independently promoted consumers' purchase behaviors.

The results also bring some findings for practical business to us. The power of customer's self-control is relative strong during periods close to the time when s/he arrived at the store. This means that placing products with price promotion near the entrance won't work very well. This may be because customers don't stay the sales area due to the resistance to temptation of vice category products even when price promotion on corresponding products is made. On the other hand, s/he is comparatively more likely to give in to the temptation due to the reduction of regulatory resources as periods are passed from the time when s/he arrived at the store. That is, s/he has high possibilities to be stay in sales area on vice category products. In addition, price promotion has an effect that enhances the probability of customers' purchasing vice category products. Therefore, in terms of supermarkets' layout, store managers should arrange sales promotions in the second half of a customer's shopping path. However, allocating sales area of vice category products near to registers is not recommended because existing study [15] implied that consumers regain the strength of self-control after they satisfied their desire. Furthermore, a design of sales area which attracts customers' attentions to price promotion is expected to be useful to improve the probabilities to stay them in there and to buy products.

There are some limitations in this paper which need to be discussed in the future. By referring to the existing study [3], this study only examined the effect of price promotion on vice category products. In addition, when developing the model, we only selected potato chips as the study object, so the model applicability can be insufficient. And the new trend of pursuit of health and growing attention to healthy lifestyle will promote a study about the influence of price promotion on purchasing virtue category products as well. Even if the discounts of virtue category products are little, and sometimes even none, customers may also be willing to buy them in order to keep a healthy diet. As for another matter, the definition of the concepts of vice and virtue category products is still open to discuss in that many authors have put forward related but different concepts. For example, the existing study [16] believes that virtue category products are utilitarian products while vice category products are hedonic products. In order to improve the accuracy, we need to thoroughly compare those definitions proposed in the previous papers, figure out all the similarities and differences, and then further specify the different definitions of all kinds of products in future's work.

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REFERENCES

- [1] W. Hofmann, M. Friese and F. Strack, "Impulse and Self-Control From a Dual-Systems Perspective," *Perspectives on Psychological Science* a Journal of the Association for Psychological Science, Vol. 4, No. 2, pp. 162-176, 2009.
- [2] J. Parreño-Selva, F. J. Mas-Ruiz and E. Ruiz-Conde, "Price promotions effects of virtue and vice products," *European Journal of Marketing*, Vol. 48, No. 7/8, pp. 1296-1314, 2014.
- [3] S. Shibasaki, K. Yada and K. Takai, "Self-control and Consumer Behavior," *Proceedings of 15th International Marketing Trends Conference 2016 Venice*, pp. 1-10, 2016.
- [4] K. Wertenbroch, "Consumption self-control by rationing purchase quantities of virtue and vice," *Marketing Science*, Vol. 17, No. 4, pp. 317-337, 1998.
- [5] J. Yan, K. Tian, S. Heravi and P. Morgan, "The vices and virtues of consumption choices: price promotion and consumer decision making," *Marketing Letters*, Vol. 28, pp. 461-475, 2017.
- [6] R. F. Baumeister, "Yielding to Temptation: Self-Control Failure, Impulsive Purchasing, and Consumer Behavior," *Journal of Consumer Research*, Vol. 28, No. 4, pp. 670-676, 2002.
- [7] S. J. Hoch and G. F. Loewenstein, "Time-inconsistent Preferences and Consumer Self-Control," *Journal of Consumer Research*, Vol. 17, No. 3, pp. 492-507, 1991.
- [8] R. F. Baumeister, T. F. Heatherton and D. M. Tice, "Losing control: How and why people fail at self-regulation," *Clinical Psychology Review*, Vol. 15, No. 4, pp. 367-368, 1994.
- [9] S. K. Hui, E. T. Bradlow and P. S. Fader, "Testing Behavioral Hypotheses Using an Integrated Model of Grocery Store Shopping Path and Purchase Behavior," *Journal of Consumer Research*, Vol. 36, No. 3, pp. 478-493, 2009.
- [10] C. Narasimhan, S. A. Neslin and S. K. Sen, "Promotional Elasticities and Category Characteristics," *Journal of Marketing*, Vol. 60, No. 4, pp. 17-30, 1996.
- [11] R. F. Baumeister, E. Bratslavsky, M. Muraven and D. M. Tice, "Ego Depletion: Is the Active Self a Limited Resource?" *Journal of Personality and Social Psychology*, Vol. 74, No. 5, pp. 1252-1265, 1998.
- [12] K. D. Vohs and R. J. Faber, "Spent Resources: Self-Regulatory Resource Availability Affects Impulse Buying," *Journal of Consumer Research*, Vol. 33, No. 4, pp. 537-547, 2007.
- [13] K. Yada, "Path analysis in a supermarket and string analysis technique," *Proceedings of the Institute of Statistical Mathematics*, Vol. 56, pp. 199-213, 2008.
- [14] K. D. Vohs, R. F. Baumeister, B. J. Schmeichel, J. M. Twenge, N. M. Nelson and D. M. Tice, "Making Choices Impairs Subsequent Self-Control: A Limited-Resource Account of Decision Making, Self-Regulation, and Active Initiative," *Journal of Personality and Social Psychology*, Vol. 94, No. 5, pp. 883-898, 2008.
- [15] D. M. Tice, R. F. Baumeister, D. Shmueli and M. Muraven, "Restoring the self: Positive affect helps improve self-regulation following ego depletion," *Journal of Experimental Social Psychology*, Vol. 43, pp. 379-384, 2007.
- [16] R. Dhar and K. Wertenbroch, "Consumer Choice Between Hedonic and Utilitarian Goods," *Journal of Marketing Research*, Vol. 37, No. 1, pp. 60-71, 2000.